
Results of the Archbold Expeditions. 16
Some Marsupials of New Guinea and Celebes

BY G. H. H. TATE AND RICHARD ARCHBOLD

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Article IV.—RESULTS OF THE ARCHBOLD EXPEDITIONS.
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SOME MARSUPIALS OF NEW GUINEA AND CELEBES

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¹ *Murexia*, new subgenus of *Phascogale*, with type *Phascogale murex* (see p. 339).

² *Ornoryctes*, new subgenus of *Peroryctes*, with type *Perameles ornatus* Thomas (see p. 352).

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INTRODUCTION

Several preliminary papers containing descriptions of new species of rodents and marsupials¹ of the Archbold collections have already been published under the general title of the present series. In addition, the narrative of the 1934 Archbold Expedition to New Guinea² and a report of the Muridae of the Indo-Australian region³ have been completed.

The present contribution, dealing with the marsupials, is a fairly full report based upon material contained in the same collections. In it an attempt has been made to integrate the somewhat scattered data upon the fauna in question.

The series of discussions and descriptions are accompanied in selected instances by line illustrations of the skulls and teeth of the animals treated, and in all cases by tables showing the measurements of short series of specimens. Body and skull measurements are expressed in millimeters; altitudes in meters; and colors in terms of Ridgway, 'Color Standards and Nomenclature,' 1912.

¹ 1935, Amer. Mus. Novit. Nos. 801-804, 810, 823, 846.

² Archbold and Rand, 1935, Bull. Amer. Mus. Nat. Hist., LXVIII, pp. 527-579.

³ 1936, Bull. Amer. Mus. Nat. Hist., LXXII, Art. 6, pp. 501-728.

DASYURIDAE

The dasyures, phascogales and their allies are polyprotodont marsupials lacking all trace of syndactyly, one of the outstanding characters of the bandicoots which possess a similar type of dentition. Wood Jones¹ placed the family on the same taxonomic level with the Thylacinidae and Myrmecobiidae, the subterranean Notoryctidae and the American Didelphidae. Later Pocock² brought forward evidence purporting to show the essentially close kinship of *Thylacinus* to *Sarcophilus*, thus opposing the views of Bensley, Gregory and Osborn. The Torresian dasyures are all referable to two subfamilies: the less specialized, insectivorous rather than carnivorous, Phascogalinae and the carnivorous, more (?) specialized Dasyurinae. Although the latter family comprises relatively few genera and species, most of its components are much larger animals than the phascogales; the phascogales on the contrary comprise a large number of species and many generic and subgeneric divisions which show a relatively wide range of adaptive variations in structure.

PHASCOGALINAE

Wood Jones³ treats of five full genera, *Phascogale*, *Chaetocercus*, *Dasyuroides*, *Sminthopsis* and *Antechinomys* in the present subfamily. Of these the first alone is known from New Guinea. Any one of the other four genera when compared with *Phascogale* must be considered decidedly more specialized. In *Chaetocercus* one lower premolar is missing; in *Dasyuroides* the toes of the hind feet are reduced to four; in *Antechinomys* the hind feet are modified for leaping and the ears enlarged; and in *Sminthopsis* the tail becomes incrassated,⁴ the foot being also somewhat long and narrow. In one respect *Phascogale* is itself variably specialized: its pouch may be either well or little⁵ developed.

PHASCOGALE TEMMINCK

Phascogale TEMMINCK, 1827, 'Monogr. de Mammalogie,' I, pp. 56-58.

Like the Peramelidae and the genus *Phalanger* of the Phalangeridae, the phascogales seem at the present time to have developed rather markedly in New Guinea—at least the groups of species which have recently been named subgenera suggest that such is the case. Also, like the bandicoots, the New Guinea phascogales are relatively unspecialized

¹ 1923, 'Mamm. S. Australia,' pt. 1, p. 84.

² 1926, Proc. Zool. Soc. London, pp. 1073-1082.

³ 1923, 'Mamm. S. Australia,' pt. 1, p. 94.

⁴ Compare the *elegans* group of *Marmosa* of the lower half of South America.

⁵ *P. minutissima*, *lorentzii*, *dorsalis* and *thorbeckiana* have well-developed pouches; *P. swainsoni*, *flavipes* and *unicolor* have pouches little or not at all developed. See Pocock, 1926, Proc. Zool. Soc. London, p. 1070.

forms, there being no approach to such leaping specializations as are seen in the Australian *Antechinomys* and *Sminthopsis*. If lack of specialization indicates primitiveness the Papuan phascogales should be considered primitive.

If the views of Matthews¹ are applied to the phascogales and bandicoots, the unspecialized Papuan animals will represent descendants of ancestral stocks which have been able to persist only outside their original habitat (Australia ?) thus making room for their more specialized Australian kin. It must be admitted, however, that the New Guinea region at the present day seems to constitute for them a very satisfactory place in which to develop a number of new (though minor ?) specializations, expressed under the present subgeneric groupings.

Phascogale is currently divided into several subgenera:

- Phascogale*, type *pennicillatus* (Australia)
- Antechinus*, type *flavipes* (Australia and S. Papua)
- Myoictis*, type *wallacii* (New Guinea)
- Phascosorex*, type *dorsalis* (New Guinea)
- Neophascogale*, type *venusta* (New Guinea)

To the above we add yet another name, *Murexia*.²

Bensley³ selected *P. flavipes* as a morphologically central form of *Phascogale*. This action was from the taxonomic standpoint hardly correct, for the type of *Phascogale* subgenus is actually *pennicillatus*, *flavipes* being type for the subgenus *Antechinus*. However, from the viewpoint of phylogeny and morphology it appears that *Antechinus* may be less advanced than *pennicillatus*. The fact that the last upper p is larger than the penultimate upper p is, according to Bensley, an indication that *Antechinus* (with *Murexia*), *Phascogale* (subgenus) and *Neophascogale* are less specialized than are *Phascosorex* and *Myoictes*, in which the reverse arrangement prevails. (See illustrations of representative species, Fig. 1, A-H.)

SUBGENUS ANTECHINUS MACLEAY

Antechinus MACLEAY, 1842, Ann. Mag. Nat. Hist., (1) VIII, pp. 241, 337.

TYPE.—*Antechinus stuarti* Macleay (by monotypy) = *Phascogale flavipes* Waterhouse. Thomas (1888, 'Cat. Marsup. Monotr.') designated *flavipes* type of *Antechinus*, but Palmer (1904, 'N. A. Fauna,' No. 28) showed the designation in correct form.

¹ 1915, Ann. New York Acad. Sci., XXIV, pp. 171-318.

² *Murexia*, n. subg., large-sized *Phascogale* with short, mouse-like pelage, and very long bare-appearing tail. Skulls heavily built, with deep zygomata. A space between i¹ and i² as in *Myoictis*, *Antechinus* and *Phascosorex*; p¹, p³, p⁴ becoming progressively larger as in *Neophascogale* and *Antechinus*. Type: *Phascogale murex* Thomas. Other forms referable to *Murexia* are *aspera* Thomas and *maxima* Stein. Skull, see Fig. 1B.

³ 1903, Trans. Linn. Soc. London, (2) IX, pt. 3.

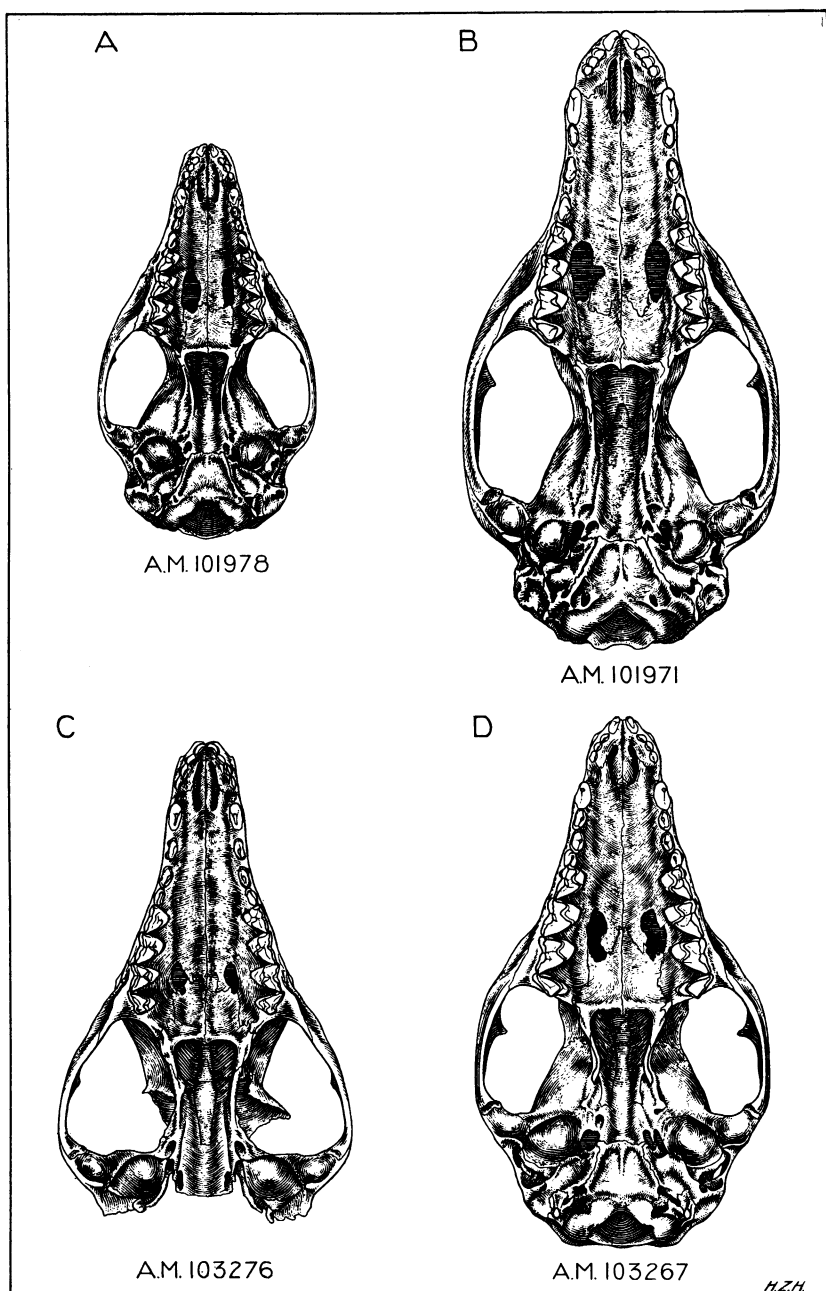


Fig. 1. Palatal views of skulls of (A) *Phascogale melanura mayeri*; (B) *P. murex aspera*; (C) *P. venusta*; (D) *P. melas senex*.

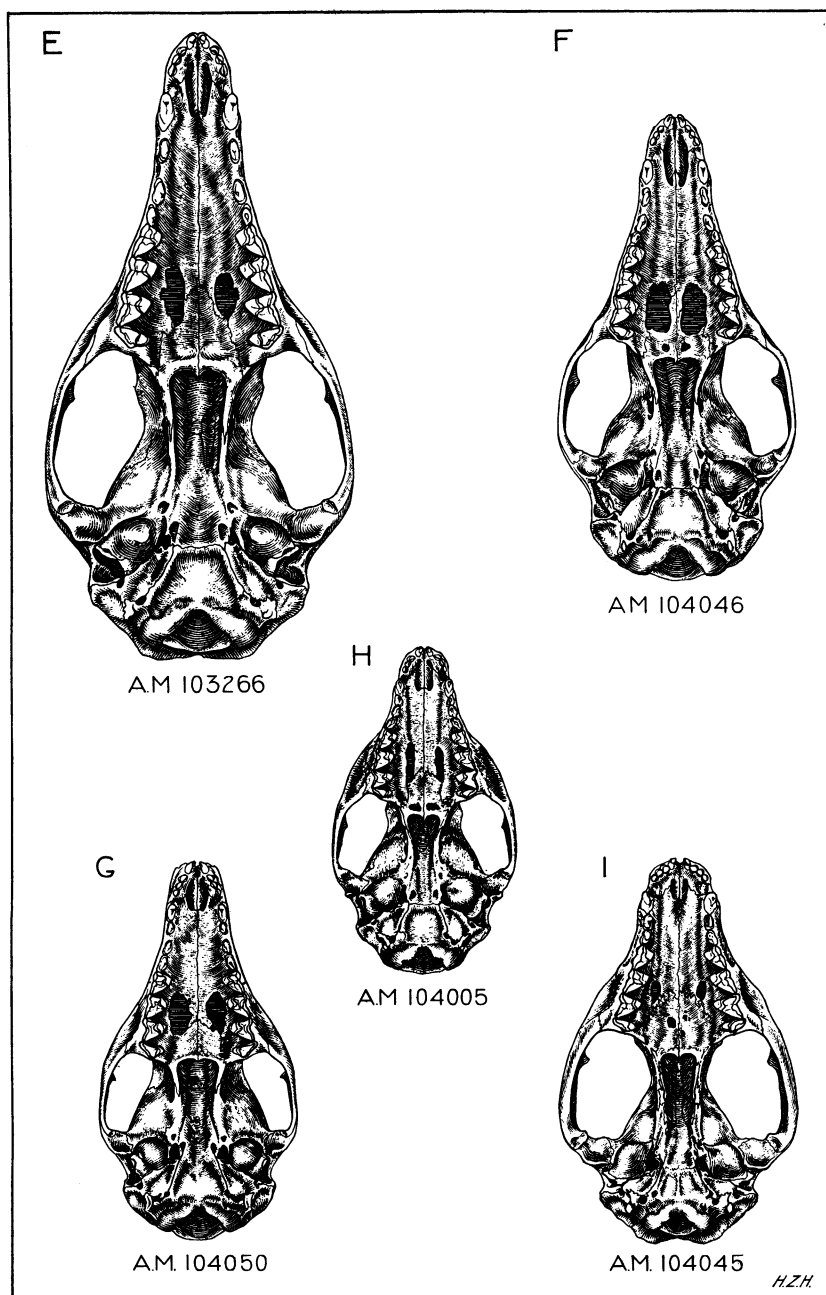


Fig. 1 (continued): (E) *P. doriae pan*; (F) *P. dorsalis whartoni*; (G) *P. tafa*; (H) *P. rona*; (I) *Dasyurus albopunctatus daemonellus*. A to H $\times 3/2$; I $\times 3/4$.

There seems to be no reason to doubt that *stuarti* and *flavipes* are two names for the same form of phascogale. *Flavipes* came from "north of Hunter's River, New South Wales"; *stuarti* from Spring Cove, below Sydney, New South Wales. From Waterhouse's (1837) account of *flavipes* it appears that the tail is finely enough haired for the tail scales to show through; that $\frac{i^1}{i_1}$ are proportionately small; that p_4 is extremely small. Macleay's cut of *stuarti* (*loc. cit.*, Pl. VII), drawn by Stuart, is not informative, nor is Waterhouse's¹ plate of *flavipes*. From Thomas' (*loc. cit.*) writings (he had the type before him), it appears that *flavipes* has small claws, a bicolored (paler beneath) tail; 8 mammae; a flat, broad skull with short conical muzzle; nasals distinctly broadened behind; short (3 mm.) anterior palatal foramina and long posterior vacuities; small rounded bullae. The teeth (Thomas, *loc. cit.*, Pl. xxv, fig. 5) show p^1 , p^3 , p^4 successively larger from front to back, and p_1 and p_4 subequal, with p_3 largest; canines long and sharp. None of the measurements published by Thomas are taken from the type specimen. From the above the characteristics of typical *Antechinus* can be gathered.

In the recent list by Iredale and Troughton² *Antechinus* is treated as a full genus, with five races of *flavipes* (one, *adusta*, from north Queensland), *godmani*, *belus*, *swainsoni*, *minimus*, *maculatus*, *macdonnellensis*, *mimulus* and *spicalis* included in it.

In Thomas's³ remarks on *melanura* of Papua the suggestion is put forward that the species is allied to *Antechinus* of Australia. It was only doubtfully linked with *longicaudata*.

Actually, though the dentition agrees with that of the type of *Antechinus*, the more densely haired tail of *melanura* sets it off somewhat. Its rufous post-auricular patches are reminiscent of those described for *mimulus* from north Australia.

If our specimen of *tafa* (from Mt. Tafa) should prove to be merely a subspecies of *longicaudata* with type locality Aru Island (and the point is very doubtful), then comparison of the skull and dentition of *tafa* with that of *melanura* supports to some extent Thomas' alliance of the two and the inclusion of *longicaudatus* and *tafa* in *Antechinus*. The dentitions are singularly alike, yet the skins are markedly distinct. However, the heavier structure of the skull of *melanura* is noteworthy, also its wider arches, much deeper zygoma, and very much higher coronoid

¹ 1841, 'Jardine's Nat. Libr.', X, Pl. ix.

² 1934, Mem. Austr. Mus. Sydney, VI, pp. 4-6.

³ 1899, Ann. Mus. Civ. Genova, (2) XX, p. 192.

process of the mandible. Again in our specimen of *tafa* the frontal region of the skull is depressed.

The long-tailed, almost rat-like forms *murex*, *aspera* and *maxima*, though possessing the same proportions in their upper premolars as *Antechinus*, are now distinguished as a separate subgenus *Murexia*. Whether any of the Australian forms can be assigned to that group is yet to be determined. Thus the New Guinea membership in *Antechinus* is now limited to the forms *melanura*, *modesta*, and *mayeri*. And there remain unplaced (in the subgeneric sense) (1) *longicaudata*, (2) *tafa*, (3) *naso*, (4) *rona* (possibly referable to *Antechinus* on account of similarity of skull (Fig. 1 H) to that of *melanura* (Fig. 1 A)).

Phascogale (*Antechinus*) *melanura melanura* Thomas

Phascogale melanura THOMAS, 1899, Ann. Mus. Civ. Genova, (2) XX, p. 191.

MATERIAL.—Papua, Mafulu, 1200 meters, 1 y. ad. ♂; Matsika, 950 m., 1 y. ad. ♂.

The type locality of *melanura*, Moroka, 1300 meters, lies less than 30 miles southeast of the localities listed above and on the same general mountain slope.

The race *modesta* Thomas came from Mt. Goliath, Dutch New Guinea.

MEASUREMENTS.—See p. 422.

Phascogale (*Antechinus*) *melanura mayeri* Dollman

Phascogale mayeri DOLLMAN, 1930, Proc. Zool. Soc. London, p. 433.

MATERIAL.—Dutch New Guinea, Weyland Mts., Mt. Derimapa, 1600 meters, 1 adult ♀.

The type locality of *mayeri* was Arfak Mts., but the present specimen was identified by Dollman as *mayeri* and is undoubtedly inseparable. The close likeness of both skin and skull of our *mayeri* to *melanura* is undeniable.

MEASUREMENTS.—See p. 422. Skull (Fig. 1 A).

SUBGENUS MUREXIA (see p. 335, footnote)

This subgenus of *Phascogale* contains *murex*, *aspera* and *maxima*. Their type localities are, respectively, Sattelberg Mts., Huon Peninsula; Utaqua River, south Dutch New Guinea, 600 meters; and Japen Island, Geelvink Bay, Dutch New Guinea. On account of their relatively larger teeth (than in true *murex*) our small series from Weyland Mountains must be referred to the race *murex aspera*.

Phascogale (Murexia) murex aspera Thomas

Phascogale murex aspera THOMAS, 1913, Ann. Mag. Nat. Hist., (8) XII, pp. 211-212.

MATERIAL.—Dutch New Guinea, Weyland Range, 1 ad. ♂, 1 y. ad. ♂, 1 juv. (pouch ?) ♂, 1 y. ad. ♀ (all collected by Shaw Mayer).

MEASUREMENTS.—See p. 423. Skull (Fig. 1 B).

SUBGENUS **NEOPHASCOGALE** STEIN

Neophascogale STEIN, 1933, Zeits. f. Säugetierk., VIII, p. 87.

GENOTYPE.—*Phascogale venusta* Thomas (by original designation). Additionally listed, *rubrata*.

Thomas originally made *venusta* a subspecies of *lorentzii*, but in 1922¹ he concluded that it was "quite a different species." Stein's omission of *lorentzii* from *Neophascogale* is therefore understandable.

Lorentzii Jentink² was apparently melanistic. Its pelage "not adpressed like other *Phascogale*-species," combined with the long claws "stronger and larger than in other *Phascogale*-species known to me" strongly suggest *Neophascogale* nevertheless. Jentink (*loc. cit.*, p. 236) mentions that *lorentzii* has smaller teeth than *nouhuysii* (a *Myoictis*) and "more inflated" audital bullae, also "the skull, as a whole . . . much more slender." Again (*loc. cit.*, p. 237) "in *lorentzii* . . . the third upper premolar is . . . smaller than the second one; . . . in *lorentzii* . . . the third lower premolar is very small, the second being more than twice longer and broader." All of the above descriptive matter is in agreement with Stein's *Neophascogale*.

Characters of *Neophascogale* are the lack of diastema between i¹ and i², its long narrow muzzle, small size of third p compared with first and second p (see Fig. 1 C), and finally the greatly elongated anterior claws.

Phascogale (Neophascogale) venusta Thomas

Phascogale lorentzii venusta THOMAS, 1921, Ann. Mag. Nat. Hist., (9) VIII, p. 358.

Phascogale venusta THOMAS, 1922, 'Nova Guinea,' XIII, p. 739.

MATERIAL.—Dutch New Guinea, Weyland Range, 1 ad. ♂ (coll. Stein), 1 juv. ♂, 1 y. ad. ♀ (coll. Shaw Mayer), all topotypes.

MEASUREMENTS.—See p. 424. Skull (Fig. 1 C).

SUBGENUS **MYOICTIS** GRAY

Myoictis GRAY, 1858, Proc. Zool. Soc. London, p. 112; 1858, Ann. Mag. Nat. Hist., (3) II, p. 223.

¹ 1922, 'Nova Guinea,' XIII, p. 739.

² 1911, Notes Leyden Mus., XXXIII, p. 234.

GENOTYPE.—*Myoictis wallacii* Gray (by monotypy).

The characters of *Myoictis*, recently briefly recapitulated by Stein¹ are quite readily observable in the wood cut accompanying Gray's articles. The type, though so young as to lack m^3 and m^4 , shows in Gray's figure the great proportional width of the molar teeth. Only two upper premolars are visible. The shortness of the anterior palatal foramina and large size of the alisphenoid bullae are plainly to be seen, though the diastema between i^1 and i^2 hardly shows in the drawing and can only be inferred from "the first tooth very small, hid in the gums, the others all equal, lancet-shaped, rather crowded . . . It was not until a most careful examination of the space between the front upper cutting teeth, that I could find any indication of the front pair of cutting teeth found in the allied genus *Antechinus*." Gray's colored plate shows *wallacii* to be far less vividly colored than mainland species such as *melas*, its general color plan being more like that of *Phascosorex pan* Stein, but his description and particularly the drawing of the skull agree more closely with *Myoictis*.

The description and carefully executed figures of *Phascogalea melas* by Schlegel and Müller² show a melanistic skin with tail moderately haired and claws not unduly enlarged. In the skull p^4 is smaller than p^3 , i^1 is strongly set off from i^2 , and the base of the nasals is markedly and abruptly broadened (see Gray's figure of *Myoictis*, and contrast *Neophascogale*). Its type locality is Triton Bay, Dutch New Guinea.

Phascogalea thorbeckiana was described by Schlegel³ under "Observations zoologiques" far more briefly than was *melas*. With type locality Salawatti, *thorbeckiana* as described appears to agree perfectly with brightly colored specimens in our collection from the Weyland Mountains.

Peters'⁴ account of *Chaetocercus bruynii* from Andai appears to agree with the description of *thorbeckiana* and with our material, and Peters himself⁵ later placed it in the synonymy of *thorbeckiana* and published a colored plate of it.

When Thomas⁶ wrote about the animals which today are referable to *Myoictis* he synonymized *melas*, *thorbeckiana* and *bruynii* under the name *thorbeckiana*; and under *wallacii* he placed *pilicauda*. These two species were distinguished by differences in the pelage pattern and by the fact

¹ 1933, Zeitschr. f. Säugetierk., VIII, p. 87.

² 1839-1844, 'Verh. Nat. Ges. Nederl.', p. 149, Pl. XXV.

³ 1866, Nederl. Tijdschr. Dierkunde, III, pp. 256-257.

⁴ 1875, Ann. Mus. Civ. Genova, (1) VII, p. 420.

⁵ Peters and Doria, 1881, Ann. Mus. Civ. Genova, (1) XVI, p. 667, Pl. v.

⁶ 1888, 'Cat. Marsup. Monotr.', pp. 278-280.

that in *thorbeckiana* p_4 was minute and single-rooted, or absent, whereas in *wallacii* it was two-rooted and distinct.

This minute p_4 is clearly discernible in the original drawing of *melas* and in our three specimens from Weyland Mts. In Peters' drawing (*loc. cit.*, Pl. VI) of *thorbeckiana* p_4 is missing. On the other hand the condition of p_4 in *wallacii* cannot be made out clearly from Gray's woodcut. No illustration of the teeth of *pilicauda* has appeared.

Since the old names above discussed were proposed only a single additional one has appeared, *nouhuysii* Jentink.¹ That animal was partly melanistic also but to a less degree than *melas* was. The type locality of *nouhuysii* was Bivak IV, between the coast and the Hellwig Mts.

Marked characters of *Myoictis* are the heavy blunt rostrum and wide interorbital region; well marked space between i^1 and i^2 (also found in *Murexia*, *Phascosorex* and *Antechinus*); large, well-rounded bullae; large second p in comparison with small first and third p; nasals markedly broadened at their bases; striped pelage pattern and tendency to melanism (skull shown, Fig. 1 D).

It seems to be limited in range to western New Guinea.

Phascogale (*Myoictis*) *melas* Schlegel and Müller

Of these phascogales with wide short rostrum and heavy molar dentition there appear to be at best three species, namely *melas*, *wallacii* and *nouhuysii*. The majority of described races, e.g., *thorbeckiana*, *senex* and *burgersi* should be placed in *melas*. *Wallacii*, of which no material is available for study, is apparently the island representative of the southern New Guinea *pilicauda*, while *nouhuysii*, judging from the description by Jentink may be specifically distinct from both *melas* and *wallacii*. Reference of that species to *Myoictis* is provisional.

Phascogale (*Myoictis*) *melas senex* Stein

Phascogale melas senex STEIN, 1932, Zeits. f. Säugetierk., VII, pp. 255-256.

MATERIAL.—Dutch New Guinea, Weyland Mts., 1 ♂ paratype (coll. Stein); 2 ♀ topotypes (coll. Shaw Mayer).

MEASUREMENTS.—See p. 425. Skull (Fig. 1 D).

SUBGENUS PHASCOLOSOREX MATSCHIE

Phascosorex MATSCHIE, 1916, Mitt. Zool. Mus., Berlin, VIII, p. 263.

GENOTYPE.—*Phascogale dorsalis* Peters and Doria (by original designation).

Additional species listed by Matschie were *doriae*, *longicauda*,²

¹ 1911, Notes Leyden Mus., XXXIII, p. 235.

² Now in other subgenera.

naso,¹ *aspera*,¹ *murex*,¹ and also the Australian *swainsoni*, *rolandensis*, *niger* and *apicalis*.

P. dorsalis, described by Peters and Doria² and beautifully figured, was founded chiefly upon pelage characters. It was twice commented upon by Thomas,³ illustrations of skull and teeth being shown in plates 24 and 25 of the "Catalogue." In figure 2 of plate 25 (*loc. cit.*) p^1 and p^4 are shown subequal, p^3 being larger, and in the lower jaw p_4 appears smaller than p_1 , which in turn is smaller than p_3 . The skull of *dorsalis* (dorsal view only, *loc. cit.*, Pl. xxiv, Fig. 6) appears with the muzzle rather elongate and narrowed and the nasals moderately broadened behind.

The second species, *doriae*, though considerably larger, appears to be closely allied to *dorsalis*. No illustrations are known of the teeth of this form whose type locality is close to that of *dorsalis*. *Longicaudata*, *aspera* and *murex*, (the latter two now in *Murexia*) have p^4 larger than p^3 and are otherwise very different in coat characters. *Naso*, too, small of size as it is, has p^4 larger than p^3 .

In Stein's⁴ summary of the subgenus, he adds *brevicaudata* and *umbrosa* Dollman and his own species *pan*. He excludes *naso*, *aspera* and *murex* as well as the Australian species listed by Matschie.

If as suggested now the forms *naso*, *aspera*, *murex* and the Australian forms mentioned by Matschie are excluded from *Phascolosorex*, there need only be considered *doriae*, *dorsalis*, *brevicaudata*, *umbrosa* and *pan*. The first four have the Arfak Mountains for their type locality (*pan* coming from the Weyland Range) and the possibility of their being identical naturally arises. From the table (pp. 426-427) it is seen that in most cases the measurements are rather close. The type of *pan* indeed is seen to be much larger than any of the three Arfak types; and although Stein gives but one dental dimension in his paper, those of a male paratype (A.M. 103266) are very like the dimensions published by Thomas (1888) for the type of *doriae*. Similarly *umbrosa* (σ^7) has measurements which show it but little larger than the *doriae* type. If Thomas's⁵ accounts of *doriae* and *dorsalis* are compared, the principal differences (other than color variation) appear in foot dimensions and in the larger teeth of *doriae* contrasted with the small ones of *dorsalis*. The teeth of the former, $m^{1-3} = 9.0$; of the latter, 7.5. It cannot be told from the wording whether "7.5" referred to the male or to the female co-

¹ Now in other subgenera.

² 1876, Ann. Mus. Civ. Genova, VIII, p. 353; 1881, idem, XVI, p. 667, Pl. v.

³ 1886, Ann. Mus. Civ. Genova, (2) IV, p. 506; 1888, Cat. Marsup. Monotr., p. 283.

⁴ 1933, Zeits. f. Säugetierk., VIII, p. 87.

⁵ 1887, Ann. Mus. Civ. Genova, (2) IV, pp. 506-507.

type. "7.0" in his "Catalogue" (1888, p. 299) was definitely marked ♀. The question whether the lengths 7.0, 7.5 and 9.0 can refer to widely varying individuals of a single species or whether *doriae* and *dorsalis* represent two fully distinct species with the same (? altitude) habitat can however be settled with reasonable certainty; for the discovery of the little series of *Phascolosorex dorsalis whartoni* (2 males, 1 female, 1 young, sex unknown) from Mt. Tafa, Papua, indicates that a species of *Phascogale* much inferior in size to *doriae*, *umbrosa* and *pan* exists in the higher mountains. And although the measurements of that series are slightly less than those given by Thomas for *dorsalis*, reference to the table (pp. 426-427) will show them virtually conspecific. It seems probable that true *dorsalis* will be rediscovered in the Arfak Mountains at a considerably greater altitude than the habitats of *doriae* and *umbrosa*.

Umbrosa and *pan* are apparently closer to *doriae* than to *dorsalis*, and the former at least should probably rank as a race of *doriae*.

Brevicaudata Dollman appears in some respects to be intermediate between *doriae* and *dorsalis*. Its type locality is close to that of *pan* Stein.

Notable characters of *Phascolosorex* are the elongate, narrow rostrum and palate; rather small audital bullae; nasals slightly broadened basally; slight diastema between i^1 and i^2 ; second upper p larger than first and third upper p; pelage with single dorsal stripe; range apparently limited to the mountains of New Guinea. Skull shown in Fig. 1 E.

Phascogale (*Phascolosorex*) *doriae* Thomas

Phascogale (*Phascolosorex*) *doriae doriae* Thomas

Phascogale doriae THOMAS, 1886, Ann. Mus. Civ. Genova, (2) IV, p. 208.

MATERIAL.—Dutch New Guinea, Kofo, Anggi, Arfak Mts., 1 ad. ♀; 1 young, sex indeterminable (both lacking skulls).

Phascogale (*Phascolosorex*) *doriae pan* Stein

Phascogale pan STEIN, 1932, Zeits. f. Säugetierk., VII, p. 255.

MATERIAL.—Dutch New Guinea, Weyland Mts., 1 ad. ♂ paratype (coll. Stein); 1 y. ad. ♂ and 1 ad. ♀ topotypes (coll. Shaw Mayer).

MEASUREMENTS.—See pp. 426-427. Skull (Fig. 1 E).

Phascogale (*Phascolosorex*) *dorsalis whartoni* Tate and Archbold

Phascogale dorsalis whartoni TATE AND ARCHBOLD, 1936, Amer. Mus. Novit. No. 823, p. 4.

MATERIAL.—Central Division of Papua, Mt. Tafa, 2070 meters, 1 ad. ♂ (type), 2 y. ad. ♀s; Murray pass, 4860 meters, 1 ad. ♂.

This form is apparently the eastern representative of the small-sized *dorsalis* of the Arfak Mountains described in 1876.

MEASUREMENTS.—See p. 427. Skull (Fig. 1 F).

Species of *Phascogale* Unplaced Subgenerically

The relationships of the species *longicaudata*, *tafa* and *rona* have not been satisfactorily worked out. The first two may be closely related to each other and their nearest relatives may later prove to be *Murexia*. *Rona*, possibly allied to *naso* Jentink, may later be grouped with *Antechinus*.

Phascogale tafa Tate and Archbold

Phascogale tafa TATE AND ARCHBOLD, 1936, Amer. Mus. Novit. No. 823, p. 3.

MATERIAL.—Central Division of Papua, Mt. Tafa, 2100 meters, 1 ad. ♀ (type).

The unique female animal representing this species appears to be most nearly allied to *longicaudata* with type locality the Aru Islands. Due to the great altitude of the collecting station (2100 meters) it is unlikely to be identical to *longicaudata*. Thomas'¹ record of a female specimen of "*longicaudata*" from Haveri, between the Astrolabe Range, Papua (700 meters) almost certainly refers to this type of *Phascogale*, and again it may be represented in Australia.

MEASUREMENTS.—See p. 428. Skull (Fig. 1 G).

Phascogale rona Tate and Archbold

Phascogale rona TATE AND ARCHBOLD, 1936, Amer. Mus. Novit. No. 823, p. 2.

MATERIAL.—Central Division of Papua, Rona, 1 ad. ♀ (type).

The only species from New Guinea to which *rona* might conceivably be allied is *naso* Jentink. *Rona* is a very much smaller animal. The small size of its feet and the general shortening of the entire skull from front to back are characteristic. It will bear careful comparison with the many small Australian species, to some of which it may be shown to be allied.

MEASUREMENTS.—See p. 428. Skull (Fig. 1 H).

DASYURINAE

Two genera only are referable to this subfamily of carnivorous (or partly insectivorous) marsupials, *Dasyurus* (spotted cats) and *Sarcophilus* (Tasmanian Devil). The latter does not occur in New Guinea.

Compared with the Phascogalinae the present animals (*Dasyurus*) are notable for their relatively massive, short skulls and jaws, and for the

¹ 1897, Ann. Mus. Civ. Genova, (2) XVIII, p. 621.

reduction of the number of premolars to 2/2. The large pits in the palate just anterior to the canines for reception of the tips of the lower canines are noteworthy. The pouch which is well developed opens backwards.

DASYURUS E. GEOFFROY ST.-HILAIRE

Dasyurus E. GEOFFROY ST.-HILAIRE, 1796, Bull. Soc. Philom., I, pt. 1, p. 106.

GENOTYPE.—*Didelphis maculata* Kerr = *Mustela quoll* Zimmermann (fide Iredale and Troughton).¹

In Australia, besides *quoll* (= *maculatus*), the species *geoffroyi* (*Dasyurinus* Matschie), *hallucatus* (*Satanellus* Pocock) and *maculatus* and *gracilis* (*Dasyurops*) are recognized by Iredale and Troughton (*loc. cit.*).² The New Guinea area contains a single full species *D. albopunctatus*.

Dasyurus albopunctatus Schlegel

The dasyures of New Guinea appear divisible into two races, large and small, which have commonly been considered full species. Our material (two males from Mt. Tafa, one male from Ifaar, north coast of New Guinea) combined with published records suggest that the large form *daemonellus* may be a lowland race, to which can be referred the specimens from Sattelberg Mts. (Meyer, 1899) and A.M.100458 from Ifaar, and an upland race *albopunctatus* (synonym *fuscus*) to which our material from Mt. Tafa is referable.

Dasyurus albopunctatus albopunctatus Schlegel

Dasyurus albopunctatus SCHLEGEL, 1880, Notes Leyden Mus., II, pp. 51-53.

MATERIAL.—Central Division of Papua, Mt. Tafa, 2400 meters, 2 y. ad. ♂s.

MEASUREMENTS.—See p. 429.

Dasyurus albopunctatus daemonellus Thomas

Dasyurus daemonellus THOMAS, 1904, Ann. Mag. Nat. Hist., (7) XIV, p. 402.

MATERIAL.—Ifaar, north coast of New Guinea, 1 ad. ♂.

MEASUREMENTS.—See p. 429. Skull (Fig. 1, I).

¹ 1934, Mem. Queensl. Mus., VI, p. 12.

² Note the discrepancy in "*maculata* . . . = *quoll*" (*loc. cit.*, p. 12) placed in *Dasyurus*, and "*maculatus*" (p. 14) placed in *Dasyurops*. The values of the names *Dasyurinus*, *Satanellus* and *Dasyurops* have not been looked into for the present paper. See also Pocock, 1926, Proc. Zool. Soc. London, pp. 1082-1084.

PERAMELIDAE

With the elaboration of the original genus *Perameles* (genotype *P. nasuta*; type locality, according to Iredale and Troughton (1934) Sydney, New South Wales) into various new genera and consequent restriction of true *Perameles*, it has resulted that *Perameles* proper is not present in the New Guinea region. The peramelid genera now recognized from New Guinea are *Isoodon*, *Peroryctes*, *Microperoryctes* and *Echymipera*. *Suillomeles* is to be considered a synonym of *Echymipera* (see p. 359). Australian genera not recorded from New Guinea are, besides *Perameles*: *Macrotis* (= *Thalacomys*), and *Choeropus*.

All of the above genera seem fairly closely related to each other, but certain criteria to be noted as indicating varying degrees of affinity are: (1) form of the molar teeth, (2) reduction of the number of incisors, (3) degree of palatal fenestration, (4) structure and size of the audital bulla.

On the basis of Wood Jones's¹ analyses, *Macrotis* (= *Thalacomys*) is seen to be highly specialized in respect to the great lengthening of the ears, enlargement of the bullae, and reduction of the number of digits of the foot from 5 to 4. In the same way *Choeropus* with its manual digits diminished to 3, and its enlarged ears and bullae, is specialized. *Isoodon*, primarily Australian although it extends into southern New Guinea, has enlarged, pear-shaped audital bullae (though the outer ear is little increased in size) and a characteristic form of the inner structures of the conch. The bullae, as in *Perameles* proper, in *Macrotis* and in *Choeropus*, are "complete" (i.e., cover a relatively large part of the tympanic ring beneath the skull and encroach upon the median basis of the cranium).

Perameles proper possesses comparatively large rounded bullae, their diameters equalling or exceeding their distance apart, and the upper incisors unreduced in number.

In the remaining genera *Peroryctes*, *Microperoryctes* and *Echymipera* (all of New Guinea), somewhat less specialization is to be observed: In all three the bullae are small (their diameters only about one third of their distances apart) and "imperfect" or covering relatively little of the tympanic ring. *Echymipera* has the tail reduced in length and lacks an incisor tooth; *Microperoryctes* is extremely small in size compared with the family as a whole and its palate and anterior malar region are curiously pinched in below. Its pelage is very soft and mole-like, giving it the appearance of an animal fitted to spend much of its life under ground. *Peroryctes* has a full complement of incisors; but although

¹ 1923, 'Mamm. S. Australia,' pt. 1, pp. 136-137.

the *Peroryctes ornatus* group may be called unspecialized, the *P. raffrayana* group has the hind feet so lengthened as to make it appear that the animal may be saltorial.

In regard to the form of the upper molars in this family, m^1 to m^3 are in most cases subequal in outline. A quadrilateral outline is seen in *Echymipera* and *Isoodon*. In *Macrotis* the above outline is accentuated, the molars being broadened and crowded together like peas in a pod. The opposite condition is seen in *Peroryctes* and *Microperoryctes*, the hypocones¹ in those genera being so little developed that the teeth present the outlines of right triangles with their short sides facing externally and anteriorly, and their hypotenuses running between the antero-internal and postero-external angles of the teeth. In genera with quadrilateral m^{1-3} , m^4 is relatively massive and has an elongate internal face; in those with triangular m^{1-3} , m^4 is delicate and its internal face is greatly shortened (except in *Echymipera*). Probably those groups with wider, more crushing types of molars include a certain proportion of vegetable matter in their diet, while those with sharp cusped triangular teeth live upon insects, etc. (Compare drawings, Figs. 2 and 3.)

From the previous statements it appears that all of the genera of living Peramelidae are moderately specialized derivatives from an archetype which itself was already semi-fossorial, muriform and insectivorous.

If the didelphid type of molar is truly primitive, then *Peroryctes* which also has triangular molar teeth must be considered less specialized in that respect than *Echymipera* or other genera with quadrilateral molars. Also in the lower jaw in *Peroryctes* the molar teeth have true high trigonid and low talonid portions similar to those in Didelphidae, whereas in *Echymipera*, *Isoodon*, *Perameles*, *Macrotis* and *Choeropus* the talonid is raised to the same level as the trigonid and the whole crown is comparatively flat.

The full number of five upper incisors is preserved in *Peroryctes* and *Microperoryctes*. The lower incisors are, however, reduced from the didelphid four to three.

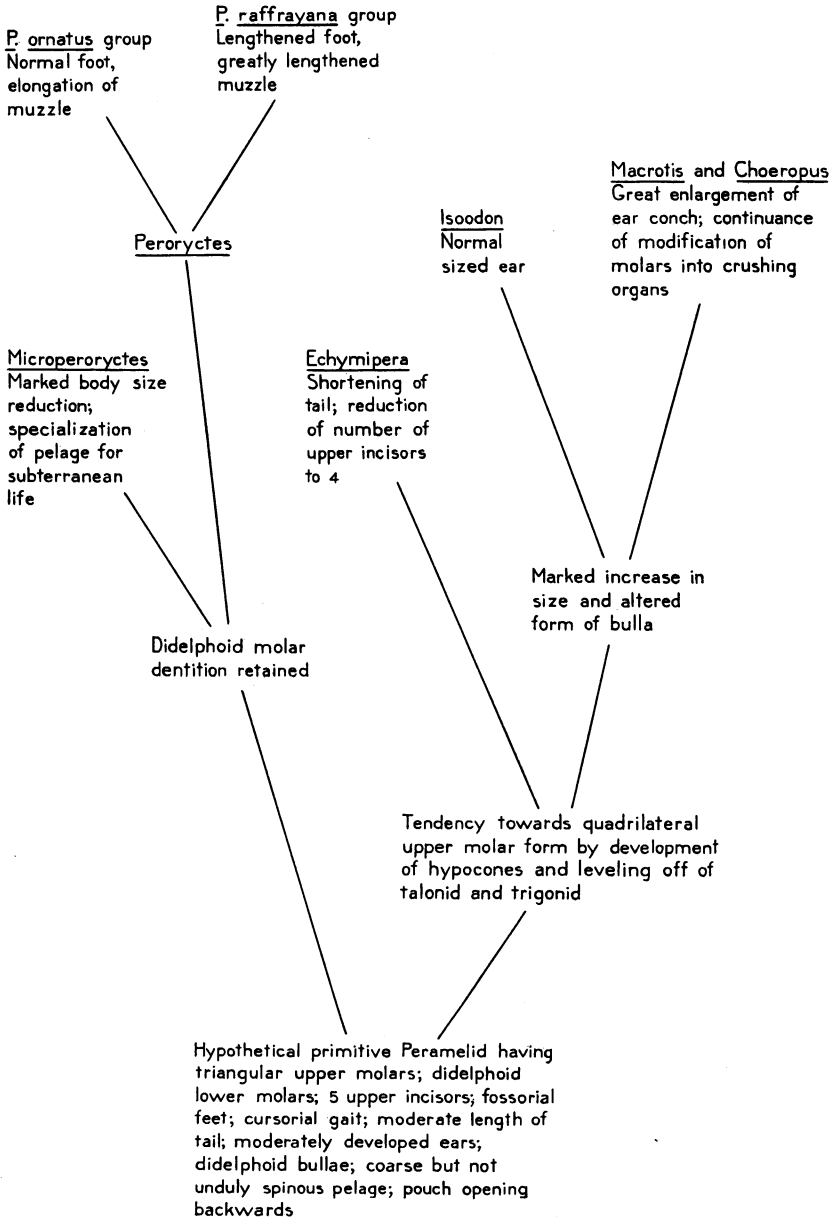
The bullae of the New Guinea genera (exc. *Isoodon*) are much closer in form to the bullae of didelphids than are those of *Macrotis*, etc., of Australia.

Reduction of the number of functional toes, and the marked syndactylous character of posterior digits 2 and 3, are characteristics respectively of the family and of most Australian marsupials. Syndactyly is undeveloped in the American opossums.²

¹ Gregory, 1922, 'Origin and Evolution of Human Dentition,' p. 73.

² See Goodrich, 1935, Proc. Zool. Soc., London, pt. 1, pp. 175-178, for recent views on syndactyly.

The phylogenetic tree of the family is tentatively outlined in the succeeding chart. In spite of affinities suggested by the teeth, the Pera-



melidae are nevertheless definitely remote from the Didelphidae as shown by their development of syndactyly and by the fact that in the former the pouch opens backwards instead of forwards.

PERORYCTES THOMAS

Peroryctes THOMAS, 1906, Proc. Zool. Soc. London, II, p. 476.

GENOTYPE.—*Perameles raffrayanus* Milne-Edwards (by original designation).

List of named forms with type localities:

<i>broadbenti</i> Ramsay	Goldie R., nr. Port Moresby
<i>dorsalis</i> Thomas	Doormapad Bivak, Mamberano Region
<i>longicauda</i> Peters and Doria	Hotam, Arfak Mts.
<i>mainois</i> Förster	Buling R., Huon, 1800–2000 meters
<i>ornata</i> Thomas	Avera, Aroa R.
<i>raffrayana</i> Milne-Edwards	Amberbaki
<i>rothschildi</i> Förster	Mt. Bolan, Huon, 4000 meters

In attempting to evaluate the species given in the foregoing list, considerable difficulty has resulted from the inadequacy of the older descriptions. The genotype *raffrayana* was described by Milne-Edwards¹ in rather general terms, and his accompanying plate conveys a rather poor idea of the animal. The only measurements given were head and body, tail, length of head from ear to muzzle, and length of hind foot (from the heel). However, the last two dimensions indicate a *Peroryctes* of large size, comparable to our specimens 104064–66 (see table p. 432) from Papua and to *broadbenti* from the same region. *Raffrayana* was based upon male and female co-types of practically equal size.

When preparing his catalogue of the marsupials, Thomas² had examined all types in European museums, including those of *raffrayana* in Paris. He had concluded that two specimens in the British Museum, one (♂ ?) from Goldie River, Papua, the other (adult ♀) from Huon Gulf were referable to *raffrayana* with type locality Amberbaki in Vogelkop. He treated *broadbenti* Ramsay provisionally as a distinct species. The third species then known was *longicauda*. All three were handled as a group (*loc. cit.* p. 230) of the genus *Perameles*.

The species *ornatus* was next proposed by Thomas³ and the similarity of its skull to that of *longicauda* was noted. Nearly a score of years after publication of the "Catalogue" Thomas⁴ laconically set up the generic term *Peroryctes* to include the above mentioned four species, with type *Perameles raffrayana*. Its characters were shown as "incisors 5/3; bullae as in *Echymipera*; braincase normal; lachrymal bone

¹ 1878, Ann. Sci. Nat., (6) VII, Art. 11, pp. 1–2.

² 1888, 'Cat. Marsup. Monotr.', pp. 227–242.

³ 1903, Proc. Zool. Soc. London, II, p. 201.

⁴ 1906, Proc. Zool. Soc. London, II, p. 476.

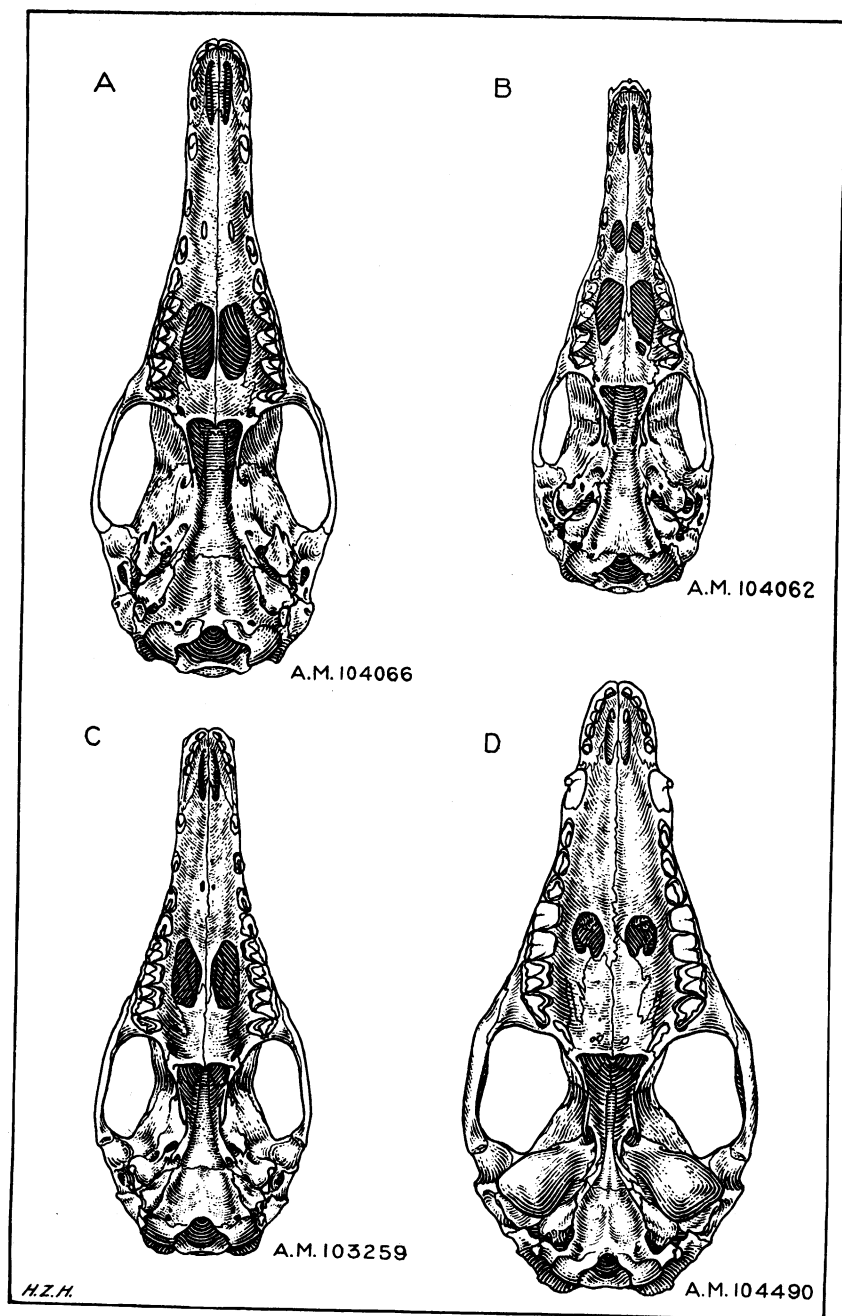


Fig. 2. Palatal views of skulls of (A) *Peroryctes raffrayana*; (B) *P. ornata*; (C) *Echymipera doreyana*; (D) *Isoodon moresbyensis*. Natural size.

COMPARISON OF THE SUBGENERA OF *Peroryctes*

	<i>Peroryctes</i> subg. type <i>raffrayana</i>	<i>Ornoryctes</i> subg. type <i>ornata</i>
Hind foot	Semi-saltorial; the metatarsal length from 68 to 70% of foot length (s.u.). Plantar surface with small flattened plates interspersed with fine hairs.	Cursorial: metatarsal length 63 to 65% of foot length (s.u.). Plantar surface with skin thrown into closely set tubercles which stand in high relief. No hairs apparent.
Tail	Relatively short (45 to 55% of head and body); not part-colored; the under surface of the tip somewhat modified. ¹	Relatively long (60-76% of head and body); terminal part white; under surface of tip unmodified.
Rostrum	Relatively lengthened in adults; nasals 46 to 49% of basal length; palate 65 to 66% of basal length.	Less lengthened in adults; corresponding percentages 40 to 48 and 64 to 65.
Premaxilla	Lacking pronounced "wings" bordering the nasal opening.	With distinct "wings" bordering nasal openings (See diagrams p. 351).
Palate	With only one pair of posterior foramina or at most the anterior opening between levels of p ² and p ³ minute (2.5 × 1.0).	With an additional pair of foramina on a level with p ² and p ³ , each opening about 4 × 2 mm. Sometimes additional openings behind the principal posterior foramina.
Bulla	With two well-developed spurs extending forward beneath inner end of glenoid fossa.	Without such spurs.
Teeth	Relatively large and heavy; m ¹⁻³ 11.5-13 mm. Canine located in pmx.-mx. suture.	Relatively small and light; m ¹⁻³ 9.5-11 mm. Canine in maxilla, behind suture.

rounded externally." In the descriptions made subsequently of *mainois*, *rothschildi* and *dorsalis* no remarks of generic significance appear to have been added.

Our own *Peroryctes* comprise (1) large, long-footed *raffrayana* (or *broadbenti*) from the Papuan region between 1200 and 2800 meters; (2) *raffrayana*, from Weyland Mts., Dutch New Guinea (coll. Stein); (3) *ornatus*, all from the Papuan temperate, 2400-2800 meters; (4) "*dorsalis*" (ident. Dollman), from Weyland Mts. (coll. Shaw Mayer).

On the basis of the structure shown by the above material, combined

¹ Ramsay (1879, Proc. Linn. Soc. N. S. Wales, III, p. 402) interpreted the condition of the tail as indicating a prehensile function. It may perhaps be tactile or used in conjunction with the apparently saltorial feet for jumping, as in *Macropus*.

with published descriptions, dimensions and figures, the species of *Peroryctes* have been found to drop into two perfectly definite categories, which are contrasted (p. 352). The one, true *Peroryctes* with characteristics of *raffrayana* and *broadbenti*; the other *Ornoryctes* subgenus with type *Permales ornata* Thomas.

In drawing up the foregoing tabulation it has, of course, been recognized that had all type specimens been studied, modifications might have been necessary. Furthermore, no attempt can here be made to allocate Förster's species *rothschildi* and *mainois*, at least on the basis of structure, though from that author's description of their pelage and from the few measurements given, they seem to belong with *ornata*. Subject to new evidence, the species of *Peroryctes* are arranged as follows:

Peroryctes subg., *raffrayana*, *broadbenti*

Ornoryctes subg., *ornata*, *dorsalis*, *longicauda*, *mainois*?, *rothschildi*?

Palatal drawings of these two subgenera are contrasted in Fig. 2, A and B, and drawings of their dentition in Fig. 3, A and B.

In our series representing the foregoing subgenera the representatives of each in the Weyland Mountains, *raffrayana* and *dorsalis*, are distinctly darker and more saturate than the corresponding forms in the east, *broadbenti* and *ornata*. Thus in *dorsalis* the distinctive dorsal stripe and two lateral rump stripes are less contrasting than the same markings in *ornata*.

Peroryctes (Peroryctes) raffrayana (Milne-Edwards)

Perameles raffrayanus MILNE-EDWARDS, 1878, Ann. Sci. Nat., (6) VII, Art 11, pp. 1-2.

Perameles broadbenti RAMSAY, 1879, Proc. Linn. Soc. N. S. W., III, p. 402.

MATERIAL.—Dutch New Guinea, Weyland Mts., 1 juv. ♂ (coll. Stein); Central Division of Papua, Mafulu, 1250 meters, 1 ad ♂; Murray Pass, Wharton Range, 2860 meters, 1 ad. ♂, 1 juv. ♂.

The above material apparently represents three local races, though it is so scanty that, for the present, separation seems not to be advisable. That from Papua comprises mountain and lowland forms which are at once distinguishable by the quality of their pelage, the mountain form having comparatively long, woolly fur, the lowland animal thin, bristly hair which is especially sparse beneath. At the same time the mountain *raffrayana* is relatively rufescent, the Mafulu animal being rather dark-colored. Apart from its unusually large size (which applies to the body and skull but not to the teeth) the type of *broadbenti* Ramsay appears to have more nearly matched our lowland-dwelling form: the Goldie River appears to be relatively remote from the really high moun-

tains. On the other hand "the longest [hairs] above one inch in length; the under fur is soft and wavy" (Ramsay, *loc. cit.*, p. 402) more closely approximates our mountain animals, for the fur of our Mafulu specimen is short (lumbar area, 12 mm., abdominal area, 10 mm.).

The specimen from Weyland Mts. cannot be compared fairly with the foregoing on account of its youth. On the basis of its dark color and short pelage, however, it falls in with the Mafulu form. The appearance of this Weyland specimen is deceptive. M^4 is not quite in place, and due to the regular spacing of p^2 and p^3 and the complete absence of p^4 the skull appears to have only two premolars. In the mandibles, however, the extreme tips of the two p_4 are just visible. The juvenal specimen from Murray Pass is just as distinctly touched with brown as is the adult. Its dorsal color comes near natal brown, with darker lines interspersed.

MEASUREMENTS.—See p. 432. Skull (Fig. 2 A), dentition (Fig. 3 A).

Peroryctes (Ornoryctes) ornata (Thomas)

The close likeness of the skins and virtual identity of the skulls of *ornata* and *dorsalis* warrant the present union of the two as races of a single species. To this same species *rothschildi* (and *mainois* ?) should probably be joined.

The status of *longicauda* from the Arfak Mountains is less sure. Thomas¹ wrote that de Beaux reported total lack of any dorsal stripe in the type specimen at Genoa.

Peroryctes (Ornoryctes) ornata ornata (Thomas)

Perameles ornata THOMAS, 1903, Proc. Zool. Soc. London, II, p. 201.

MATERIAL.—Central Division of Papua, Mt. Albert Edward, 3680 meters, 2 ad. ♂s, 1 ad. ♀, 1 juv. ♀; Mt. Tafa, 2500 meters, 1 y. ad. ♂.

Although the type locality of *ornata* (Avera, Aroa River) is comparatively close in miles to the localities at which our material was taken, it has undoubtedly a lower altitude.² The majority of the specimens agree completely with Thomas' description. One, however (A.M. 104062), has the ground color somewhat darker, thus approaching *dorsalis*. The tail length though distinctly variable is generally rather long. In our two individuals, 104060 and 104062 the tip appears to have been amputated (see p. 431). There is a definite development of longer hairs along the underside of the tails. The type skin, marked by Thomas as "measured in skin" was unquestionably stretched.

MEASUREMENTS.—See pp. 430–1. Skull (Fig. 2 B), dentition (Fig. 3 B).

¹ 1922, 'Nova Guinea,' XIII, p. 738.

² Avera was one of Meek's collecting stations. Collections marked as from there contain both highland and lowland species.

Peroryctes (Ornoryctes) ornata dorsalis Thomas

Peroryctes dorsalis THOMAS, 1922, 'Nova Guinea,' XIII, p. 737.

MATERIAL.—Dutch New Guinea, Weyland Range, 1 y. ad. ♂ (teeth scarcely worn). Collector, F. Shaw Mayer.

The type locality, Doormanpad Bivak, Mamberano Basin, 1410 meters, lies about 150 miles to the east of the Weyland Mountains, but on the same general northern watershed of the main mountain system of Dutch New Guinea. Our specimen has been earlier examined and identified by Dollman¹ as *dorsalis*. It agrees quite closely with Thomas' description. The difference in those palatal openings level with the premolars, which Thomas mentioned, probably cannot be relied upon, as in at least one specimen of true *ornata* there is an opening on one side of the palate only. Differences in the dimensions of our specimen and those published for the type are purely manifestations of differences of age.

MEASUREMENTS.—See p. 431.

MICROPERORYCTES STEIN

Microperoryctes STEIN, 1932, Zeits. f. Säugetierk., VII, p. 256.

GENOTYPE.—*M. murina* Stein.

The skull of this interesting little bandicoot is essentially a miniature of that of *Peroryctes (Ornoryctes)*, not of *P. (Peroryctes)* which has the muzzle proportionally much longer when adult. The outstanding difference appears to lie in the considerably greater degree of fenestration of the palate. The molars are of *Peroryctes* type and lack the well-developed hypocone to be seen in *Echymipera* and *Isoodon*.

The skin is mole-like or shrew-like and the claws remain highly fossorial in structure.

Microperoryctes murina Stein

Microperoryctes murina STEIN, 1932, Zeits. f. Säugetierk., VII, p. 257.

MATERIAL.—Dutch New Guinea, Weyland Range, Sumuri (Mt.), 1 y. ad. ♂ (?).

This specimen is one of the three listed by Stein.² On the field label it is marked ♂; but Stein lists his material as including one ♂ (the type, which our specimen is not), and two ♀s.

MEASUREMENTS.—See p. 433.

ECHYMIPERA LESSON

Echymipera LESSON, 1842, 'Nouv. Tabl. Règne Anim.,' p. 192.

GENOTYPE.—*Perameles doreyana* (subsequent designation, Thomas, 1888).

¹ Rothschild and Dollman, 1933, Proc. Zool. Soc. London, p. 217.

² Loc. cit. and 1933, idem, VIII, Heft 2, p. 126.

The history of the origin of the genus and settling of its genotype may be reviewed with advantage. In April, 1827¹ Lesson and Garnot² published a description of the "kalubu" from Waigeu Island, giving it in a footnote the technical name *kalubu*, but leaving it unplaced generically. A year later Lesson,³ referring to this specimen, stated that it was lost in a storm off the Cape of Good Hope. Next Fischer⁴ cited it under "*P [erameles] kalubu*."

Quoy and Gaimard⁵ described *Perameles doreyana*, collected by them at Dorey (near Manokwari), Dutch New Guinea. Finally, Lesson⁶ proposed the generic name *Echymipera*, citing under it *kalubu* Lesson from "Waigiou" and *doreyana* Quoy and Gaimard.

Years later Thomas,⁷ though synonymizing *Echymipera* with *Pera-me'es*, designated *doreyana* type of *Echymipera*. Thus Cabrera's⁸ subsequent designation of "*kalubu* Fischer" as genotype will not hold, even though it may be argued logically that Lesson's species ought to be type of Lesson's genus.

There seems to be no reason to doubt that *garagassi*, which Miklouho-Maclay⁹ described as a new genus *Brachymelis*, is a true *Echymipera*, even though its author admitted that he was aware of Lesson's generic name.

Heller's¹⁰ *Anuromeles* appears to be an *Echymipera*, even though lacking a tail. Miklouho-Maclay (*loc. cit.*) mentions that specimens of bandicoots sometimes have the tail lost (or bitten off?). Heller's red-bellied species *rufiventris* may be valid.

Forms of bandicoots which have to be considered under *Echymipera* follow, together with their type localities:

SPECIES	TYPE LOCALITY	WHEN DESCRIBED
<i>kalubu</i> (Fischer)	Waigeu	1829
<i>alticeps</i> (Cohn)	Waigeu	1910
<i>doreyana</i> (Quoy & Gaimard)	Dorey	1830
<i>rufescens</i> Peters & Doria	Kei Islands	1875
<i>keiensis</i> (Cohn)	Kei Islands	1910
<i>aruensis</i> Peters and Doria ¹¹	Aru	1875

¹ Date from Ann. Mag. Nat. Hist., (7) XVII, p. 391, 1901.

² 1827, 'Voyage Coquille,' I, p. 123 (1826).

³ 1828, 'Dict. Classique,' XIII, p. 200.

⁴ 1829, 'Syn. Mamm.,' p. 274.

⁵ 1830, 'Voy. Astrolabe,' Zool., I, pp. 100-103, Pl. xvi.

⁶ 1842, 'Nouv. Tabl. Règne Anim.,' p. 192.

⁷ 1888, 'Cat. Marsup. Monotr.,' p. 227.

⁸ 1919, 'Gen. Mamm. Marsup. Monotr.,' p. 86.

⁹ 1884, Proc. Linn. Soc. N. S. W., IX, pp. 713-720.

¹⁰ 1897, Abh. Zool. Mus. Dresden, VI, No. 8, p. 5.

¹¹ The status of *aruensis*, described as having 5 upper incisors should be reviewed. The short tail and relatively heavy malar bones suggest *Echymipera*. Possibly, however, the animal is a *Peroryctes*. The shape of the molar crowns was not illustrated.

<i>cockerelli</i> Ramsay	New Ireland	1877
<i>myoides</i> Günther	New Britain	1883
<i>garagassi</i> (Miklouho-Maclay)	Maclay coast, New Guinea	1884
<i>clara</i> Stein	Japen	1932
<i>gargantua</i> Thomas	Mimika River	1914
<i>rufiventris</i> (Heller)	Bongu, Astrolabe Gulf	1897

The relationships and values of the "species" of *Echymipera* appear from a perusal of the literature to be still in a state of confusion. When Thomas¹ wrote of *doreyana* and *cockerelli* (which he then included in *Perameles*), he drew comparatively sharp comparisons between the two species, based on size, length of muzzle, mammary formula, proportional sizes of incisor teeth and form of the molars. Under the synonymy of *doreyana* he placed *kalubu*, *rufescens*, *aruensis*; under that of *cockerelli* the names *myoides* and *garagassi*.

Cohn,² writing of "*Perameles*" of Papua concluded that two forms of *doreyana* existed, one with 3-cornered molars (suggestive of *Peroryctes* ?), the other with the inner margins of the molars broadened, making the teeth quadrilateral. His names *alticeps* (= *breviceps*) and *keiensis* are probably synonyms, respectively, of *kalubu* and *rufescens*.

Thomas³ concluded that the animals commonly referred to *doreyana* actually represented a small species (*doreyana*) and a large one which he named *gargantua*. But later⁴ he was inclined to doubt the worth of those views. Since Thomas proposed *gargantua* only one form, *clara* Stein, 1932, has been described.

Measurements drawn from type descriptions of the several forms of *Echymipera* are shown on pp. 433-434. Due to the fact that pronounced growth (age) differences occur in these bandicoots the majority of such measurements have little taxonomic value. It appears that the length of the muzzle is particularly correlated with age. Several characters used successfully for the Macropodidae and Phalangeridae, namely the dimensions and shape of the teeth, have been employed in the present case with caution, since the degree of individual variation has still to be ascertained. Such data in regard to the dentition of type specimens has not generally been published. The most valuable dental measurements usually published are the lengths m^1 - m^3 and p^4 - m^4 , due to the fact that those teeth remain contiguous and change their positions relatively little as the animal grows. The longer measurements such as c - p^4 change with the lengthening of the muzzle. Regarding the size of individual

¹ 1888, 'Cat. Marsup. Monotr.', pp. 227-239.

² 1910, Zool. Anz., XXXV, pp. 718-727.

³ 1914, Ann. Mag. Nat. Hist., (8) XIII, p. 443.

⁴ 1922, 'Nova Guinea,' XIII, p. 737.

teeth, our conclusions are based solely upon our own material. It will be seen that on such basis our specimens are separable into two classes, large-toothed animals (from Mafulu, Weyland Mts., Japen Island) which may be called *doreyana*, and small-toothed animals, *oriomo*, (from the Oriomo River) of the Western Division of Papua. But considerable range of variation within each class is also to be observed.

If the few tooth measurements to be found in type descriptions are compared with those drawn up from our material and with each other, it is seen that (1) crown length m^{1-3} of *clara* nearly equals that of *gargantua*, and that (2) of the same measurements for *rufiventris* and Thomas' specimen of "*cockerelli*" from Duke of York Island, respectively, 10.0 and 10.8, the first nearly fits our series of *oriomo* and the second our "*doreyana*" series.

Further distinctions between our two series lie in the sizes of the incisors, canines and premolars. All three specimens of *oriomo* being males, no allowance need be made for variation in tooth size due to difference of sex, and the very small size of the teeth of *oriomo* can be assumed to have systematic value. The lengths i^{1-4} in *oriomo* are, respectively, 4.7, 4.8 and 4.5 mm. In males of our "*doreyana*" series, on the other hand, $i^{1-4} = 5.3$ (Japen) and 5.2 (Weyland Mts.), and in females, 5.1 and 4.9 (both Mafulu). The canines of adult *oriomo* males have lengths of alveoli 1.3, 1.5; those of males of "*doreyana*," 2.2 (Japen) and 2.2 (Weyland); females (Mafulu) 2.2 and 2.2. All of the premolars are correspondingly larger in the "*doreyana*" animals than in *oriomo*. Concerning specimens A.M.101982 from Weyland and 103259 from Japen (males), collected, respectively, by Mayer and by Stein, the former was identified by Dollman as *cockerelli* and the latter by Stein as *doreyana*. The skulls are virtually identical in general structure but the teeth of the latter are slightly the larger (width of m^4 in Weyland specimen 4.0, in Japen specimen 4.5, but in Oriomo material 3.9 and 3.7 mm.).

Before much can be accomplished it will be necessary to obtain the above measurements (and sexes) both of existing types of species (not of other specimens which have been referred by earlier workers to those species); and also of the not inconsiderable amount of *Echymipera* material available in the museums of the world. With such data tabulated the status of the species and races of *Echymipera* ought to be susceptible of evaluation.

Regarding the triangular molars written of by Cohn (*loc. cit.*) no opinion can here be given. All of our individuals have quadrilateral molars not very dissimilar to those of *Isoodon moresbyensis*. Bandicoots

in our collection which have triangular molars are all referable to the genera *Peroryctes* and *Microperoryctes*.

The mammary formula (Thomas, 1888) may prove to have value in working out *Echymipera*. In the Archbold collection no specimens are in condition to allow counting of the mammae.

***Echymipera doreyana* (Quoy and Gaimard)**

Perameles doreyana QUOY AND GAIMARD, 1830, 'Voy. Astrolabe,' Zool. I, p. 100, Pl. xvi.

MATERIAL.—Dutch New Guinea, Japan Island, 1 ad. ♂ (Stein coll.); Weyland Mts., 1 ad. ♂ (Shaw Mayer coll.); Central District of Papua, Mafulu, 1250 meters, 2 ad. ♀s.

The characteristics of the above four specimens have been gone into in the foregoing discussion of *Echymipera*. Although the females from Mafulu are very slightly more rufous than the dark-colored males from western New Guinea it seems inadvisable to attempt any separation.

MEASUREMENTS.—Pp. 434–435. Skull (Fig. 2 C), dentition (Fig. 3 C).

Note on *Suillomeles hispida* Allen and Barbour

Suillomeles hispida ALLEN AND BARBOUR, 1909, Proc. N. E. Zool. Club, IV, pp. 44–46.

With great kindness Dr. G. M. Allen has loaned the type specimen of this animal for study. After going over the comments of the authors of the species and taking measurements of the individual teeth, we are inclined, in spite of the warmer coloration of its pelage and of our inability to discover the permanent p^4 within the maxilla,¹ to consider *Suillomeles* a juvenal (perhaps pouch young) of *Echymipera*. In the skull m^1 and m^2 alone have been erupted. The individual measurements of those teeth tally closely with those of our adult *E. doreyana* and exceed these of *orimo* from southern Papua, even though *orimo* is a much smaller animal than *doreyana* is. The individual incisors are virtually identical with those of the *doreyana* section of *Echymipera*. From the fact that *S. hispida* comes from Dorey, the type locality of *E. doreyana*, it seems probable that it should be synonymized with that species. If *hispida* really equals *doreyana* the decided brilliance of the color scheme of pouch juvenals of *doreyana* is to be noted. The pelage of a comparatively young specimen of *orimo*, which, however, has m^3 erupted and m^4 and permanent p^4 partly through, already resembles the adults in every particular.

MEASUREMENTS.—See p. 436.

¹ Loc. cit., p. 46.

Echymipera orio Tate and Archbold

Echymipera orio TATE AND ARCHBOLD, 1936, Amer. Mus. Novit. No. 823, p. 1.

MATERIAL.—Western Division of Papua, Dogwa, Oriomo River, 2 ad. ♂s, 1 juv. ♂.

The distinctness of this form of *Echymipera* has been demonstrated in the original notice and in the foregoing generic discussion. Probably the specimen from Katau which Heller¹ referred to *Anuromeles* can be assigned to *orio*.

MEASUREMENTS.—See p. 435.

ISOODON DESMAREST

Isoodon DESMAREST, 1817, 'Nouv. Dict. d'Hist. Nat.,' 2nd Ed., XVI, pp. 409-410; 1818, idem, XVIII, p. 511, footnote.

GENOTYPE.—*Didelphis obesula* Shaw.

Compared with the remaining genera of Peramelidae occurring in New Guinea, *Isoodon* is markedly set off by the relatively great size of its audital bullae and the possession in males of large canine teeth.

Contrary to the case of *Peroryctes*, *Echymipera* and *Microperoryctes*, its range is primarily Australian, extending only into the southern parts of Papua and along the coast to Port Moresby. It has thus much the same type of distribution pattern northwards as the *Rattus tunneyi* group and *Macropus agilis* have. The named forms of bandicoots referable to *Isoodon* with their type localities are as follows:

<i>auratus</i> (Ramsay)	Derby, N. W. Australia
<i>barrowensis</i> (Thomas)	Barrow Island, W. Australia
<i>macroura</i> (Gould)	Port Essington, N. Australia
<i>moresbyensis</i> (Ramsay)	Port Moresby, Papua
<i>nautilus</i> Thomas	Franklin's Isl., Nuyts Archip., S. Australia
<i>obesulus</i> (Shaw and Nodder)	Sydney, N. S. W.
<i>affinis</i> (Waterhouse)	Tasmania
<i>fusciventer</i> (Gray)	King George's Sound, S. W. Australia
<i>peninsulae</i> Thomas	Utinga, Cape York Peninsula
<i>torosus</i> (Ramsay)	Cooktown, Cape York Peninsula

The old records of *moresbyensis* refer without exception to specimens taken at various places along the south coast of Papua between meridians 146 and 148. It is therefore of interest that Archbold and Rand should have secured the series commented upon beyond, from the Oriomo River, Western Division of Papua. Geographically the source of that series lies halfway between the Australian Peninsular species and the previously known territory of *moresbyensis*.

¹ 1897, Abh. Mus. Dresden, VI, No. 8, p. 2.

***Isoodon moresbyensis* (Ramsay)**

Perameles moresbyensis RAMSAY, 1877, Proc. Linn. Soc. N. S. W., II, pp. 14-15.

MATERIAL.—Central Division of Papua, Baroka, 2 juv. ♂s; Western Division of Papua, Oriomo River, 5 ad. ♂s, 2 ad. ♀s, 1 juv. ♀.

On the basis of the present collection of *Isoodon* a few characteristics, some probably of generic value, may be pointed out. The sexes are sharply distinguishable, first by the presence of a yellowish ventral suffusion in the five males, varying in individuals from cream color to honey

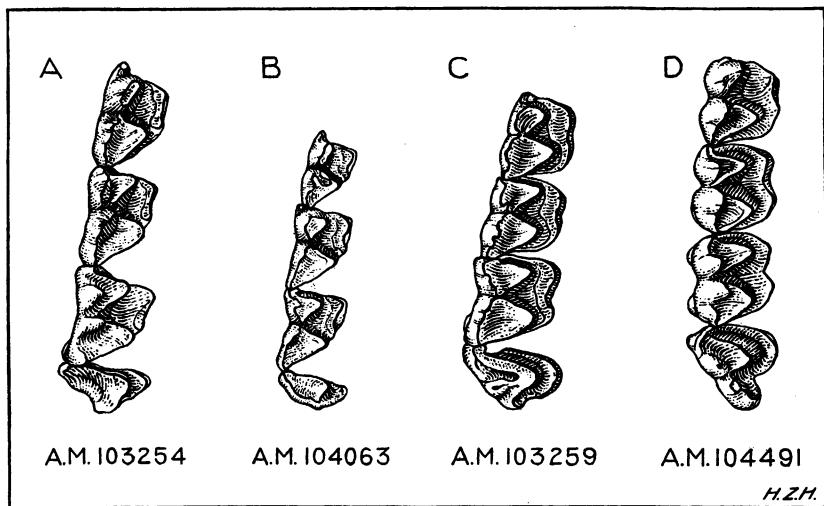


Fig. 3. Crown views of molars of (A) *Peroryctes raffrayana*; (B) *Peroryctes ornata ornata*; (C) *Echymipera doreyana*; (D) *Isoodon moresbyensis*. $\times 3$.

yellow, the two females having the underparts dull whitish. A second sexual difference appears in the skulls, for not only are the canines of the males very much larger than those of the females (alveolar length of canine 5 mm. in old males, 3 in females) but i^3 also is enlarged and distinctly caniniform in some males, whereas in females it is only slightly differentiated from the other incisors. In the mandible the canines are enlarged to correspond morphologically and functionally with those of the upper jaw.

In the juvenal specimens of the series the last premolar (deciduous) is extremely small. Its crown length is 1.3 mm. or one third of the crown length of the second (permanent) premolar. This milk tooth is replaced by a permanent tooth whose crown length is nearly 3 mm.

The anterior palate in the young animal is short and narrow, so that the incisors and canines are crowded closely together. In the adults a small space develops between i^4 and i^5 and a larger one between i^5 and c . Two of the juvenals examined have two molars erupted; the third has three and in it the tip of the permanent last premolar is just visible. The dimensions of individual molars (see table pp. 437-438) indicate either an unusually wide range of dental variation in the one race or that more than one form of bandicoot is present in the series of specimens. It is unfortunate that the two individuals from Baroka are juvenal, for Baroka is not very remote from Port Moresby, which may be considered type locality of *moresbyensis* Ramsay. The difference in size of the molars of the two specimens is noteworthy (see p. 437).

When the better collection from the Oriomo River, Western Division of Papua is compared with the near-topotypes just mentioned, further dental discrepancies are encountered: in every case, male or female, the molars of the Oriomo material exceed those of the Baroka material in width and usually in length and there appear to be two distinct types of m^4 developed.

Ramsay's type (sex not stated) was described as "fully grown, but young, with four true molars developed." It would seem about equivalent in age to our No. 104491. Bearing in mind the presence of *torosus*, *peninsulae* and *macroura* in the Cape York region of Australia and the considerable degree of aberration in the Oriomo series, it is with doubt that this material is referred to *moresbyensis*.

MEASUREMENTS.—See pp. 437-438. Skull (Fig. 2 D), dentition (Fig. 3 D).

PHALANGERIDAE

The family was classified by Wood Jones¹ into three subfamilies, Phalangerinae (phalangers and flying phalangers), with more or less bunodont molars; Phascolarctinae (*Pseudochirus* and *Phascolarctus*, the latter not known in New Guinea) with selenodont molars; and Tarsipedinae (*Tarsipes*, absent from New Guinea) with degenerate molars.

PHALANGERINAE

The Phalangerinae of New Guinea comprise the genera *Phalanger*, *Dactylopsila*, *Dactylonax*, *Eudromicia*, *Distoechurus* and *Petaurus*. In all of the above genera the molar teeth are bunodont to lophodont, and quite without the selenodont pattern of the Phascolarctinae (*Pseudochirus*). Furthermore, in the lower jaw of all, the i_{1-1} are distinctly muriform, as compared to those of *Pseudochirus* in which the cutting edge is long and set obliquely. And there is ample space (except in *Dactylonax* and *Dactylopsila*) between m_1 and i_1 which is usually occupied by three or four much reduced teeth and by the large p_4 (p_4 small in the two genera just mentioned); on the contrary, in *Pseudochirus* the space between m_1 and i_1 is small and commonly quite filled by the large macropoid p_4 and a second tooth.

The Phalangerinae appear to be the remnants of a group which has diverged so markedly that the ancestral form can be reconstructed only with much doubt. Probably *Phalanger* should be considered the least specialized of the living genera: I^1 is but little enlarged (though i_1 is completely muriform); the upper canines are large and raptorial; p^4 is massive and slightly sectorial, p^3 minute, p^2 (or 1^2) though caniniform, rather blunt; molars somewhat lophodont. In the lower jaw p_4 is the only fully functional tooth excepting i_1 anterior to the molars. The dentition appears of generalized omnivorous type. Prehension with the tail may well be a relatively new character in *Phalanger*.

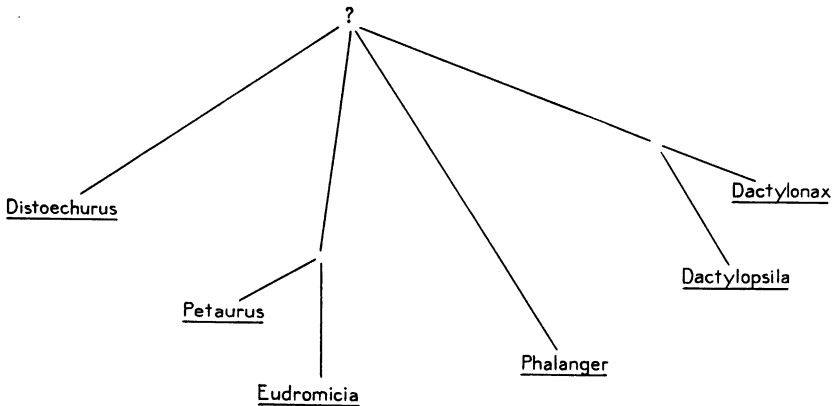
In the Phalangerinae of New Guinea several distinct lines are discernible:

- a.—*Phalanger* (see above).
- b.—*Eudromicia* and the gliding *Petaurus*, bunodont, the former with prehensile tail.
- c.—*Distoechurus*, insectivorous, with high sharp canines and premolars, and with m_4^1 lost.
- d.—*Dactylopsila* and *Dactylonax* with upper incisors, canines and anterior premolars chisel-like and with molars bunodont. Probably herbivorous.

In b, c and d, i^1 is already enlarged, chisel-like and proödont, extreme development of that condition appearing in d. The diagram fol-

¹ 1924, 'Mamm. S. Australia,' pt. 2, p. 173.

lowing merely suggests the relationship of the Phalangerine genera in the New Guinea region.



PHALANGER STORR

Phalanger STORR, 1780, 'Prodromus Meth. Mamm.,' p. 33.

GENOTYPE.—By subsequent designation (Thomas, 1888), "*Ph. orientalis*, (= *Didelphis orientalis* Pallas).

The members of the genus *Phalanger* can be sorted into four primary groups, distinguishable at a glance by strongly marked anatomical features. Those four groups may be named, respectively, *orientalis*, *celebensis*, *ursinus* and *maculatus*.¹ *Orientalis* (see p. 366) may be taken as the most central and characteristic group of the genus—a view which is reasonable on structural grounds, because *orientalis* is least specialized, on distributional grounds because it is most widely distributed and includes the most species and races, and on taxonomic grounds because it contains the genotype—then the remaining three groups can be compared conveniently with it point by point.

The *celebensis* group differs from the *orientalis* group through (1) extreme pinching in of the face anterior to the orbits, (2) reduced, rounded exterior of the mastoid-exoccipital portion of the skull, (3) thin, drawn-out paroccipital processes, (4) small size of canine and space between c and i³, also absence of p³. (See p. 378.)

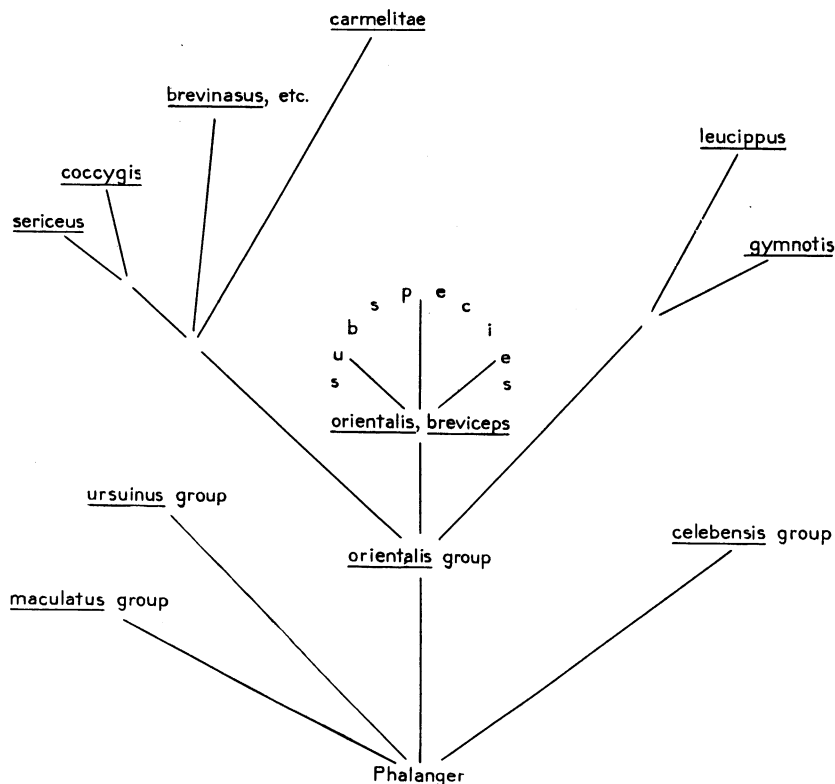
The *ursinus* group differs from the *orientalis* group through (1) the extraordinary lateral expansion of the anterior nasal openings to the extent that the width of the opening is double the height, coupled with un-

¹ Generic or subgeneric terms are available for these groups as follows: for the *celebensis* group, *Strigocuscus* Gray (1861); for the *ursinus* group, *Ceonyx* Temminck (1827), *Ailurops* Wagler (1830), and *Eucuscus* Gray (1861); and for the *maculatus* group, *Spilocuscus* Gray (1861). The *orientalis* group would naturally bear the subgeneric name *Phalanger*, under which *Phalangista*, *Coescoes*, *Balanitia*, *Sipalus* and *Cuscus* fall as synonyms.

usual breadth of the nasal bones, (2) pronounced swelling of the anterior portion of the frontal bones where they adjoin the orbit, (3) long, strong paroccipital processes, (4) i^3 larger than i^2 , and separated from c by a small space; p^3 absent; no space between c and p^1 , and p^1 and p^4 (see p. 379).

The *maculatus* group differs from the *orientalis* group through (1) moderate swelling of frontals at level of orbit, the swelling becoming extreme at level of postorbital processes of zygoma; (2) p^3 usually absent. (See p. 380.)

Palatal views representing the four groups of *Phalanger* are shown in Figs. 4-7. Their probable relationship can be expressed by the following diagram:



New Guinea, in which the two largest of the four groups of the genus *Phalanger* are indigenous, may be taken as the distributional center for the genus. Of those two the *maculatus* group alone extends into north

Queensland, the larger and more diversified *orientalis* group being restricted to New Guinea and adjoining islands. The generic range is extended to the northwest by the two small but markedly distinct groups *celebensis* and *ursinus*, the former occurring on Celebes and Sangir Islands, the latter on Celebes and Talaud Islands.

Phalanger orientalis Group

A number of forms of *Phalanger* have been described as geographical races of *P. orientalis*, particularly from the islands off the eastern part of New Guinea. The named races with their type localities are as follows: *P. o. orientalis* (Amboina), *P. o. mimicus* (Mimika River), *P. o. intermedius* (Weyland Mts., Dutch New Guinea), *P. o. ducatoris* (Duke of York Island), *P. o. breviceps* (Malaita Island), *P. o. kiriwiniae* (Trobriand Isl.), *P. o. intercastellanus* (Fergusson Isl.) and *P. o. meeki* (Louisiades).¹ It thus appears that no race of *orientalis* has been described from the mainland of the central or eastern parts of New Guinea. Furthermore, the status of such species as *microdon*, which takes the place of *orientalis* in the southern part of the Western Division of Papua, remains to be settled. There is even the possibility that that entire section comprising *ducatoris*, *breviceps*, *kiriwiniae*, etc., and the forms on southern New Britain, Long Island, Ruk Island and the Huon Peninsula would be better regarded as a Formenkreis distinct from the much larger *orientalis orientalis* from Amboina (and Wetar).

Although the matter of the subspecies of *orientalis* must for the present remain unsettled, there can be no doubt that most of the remaining New Guinea opossums are properly included in the *orientalis* group and also that certain of those same species come naturally together to form what may be considered Artenkreise. Two of the latter can be readily picked out: (a) *leucippus* and *gymnotis* (of the Aru Islands), both of which have greatly enlarged p⁴; (b) *sericeus* and *coccygis*, long-furred mountain species with skulls pear-shaped in outline. The remaining species, *carmelintae*, *brevinasus* (males only known), *matsika* (females and juvenal males only known), and *microdon*, are less definitely separable from what are known commonly as "subspecies" of *orientalis*. And before their standing can be determined, more specimens of all are needed and more work must be done upon them. Tentatively meanwhile the following arrangement of the *orientalis* group based mainly on cranial characters is offered:

¹ *Vestitus* Milne-Edwards may belong with one of the other mountain-living species.

- 1.—*leucippus* and *gymnotis*.
- 2.—*sericeus* and *coccygis*.
- 3.—True *orientalis* and (probably) *intermedius* with (possibly) *carmelitae* and *brevinasus*.
- 4.—The eastern "subspecies" of *orientalis*, with probable inclusion of *microdon*. Because of the uncertain relationship of *matsika* (whether it may not represent the female of *brevinasus*) that form must remain unplaced.

Phalanger ornatus of the islands northwest of Dutch New Guinea (see Thomas, 1888, 'Cat. Marsup. Monotr.'), has not been included in the foregoing review. No specimens are at hand, and the old descriptions of *ornatus* do not furnish the data required to place that species in relation to those given above. From the fact that Jentink (1885, Notes Leyden Mus., VII) held it to be synonymous with *orientalis*, it must surely belong in that group.

Under the species headings which now follow the salient characteristics (particularly of the skulls) of a number of the above-listed forms will be found outlined. Due to the fact that most species have been compared with the genotype *orientalis orientalis* it has been thought best to provide a rather full description of the cranial characters of that form (p. 371) so that corresponding characters in later-described species may be contrasted with it. The order in which the species are taken, however, is that of the list above.

***Phalanger leucippus* Thomas**

Phalanger leucippus THOMAS, 1898, Ann. Mus. Civ. Genova, (2) XIX, pp. 7-8.

MATERIAL.—Central Division of Papua: Mt. Tafa, 2 juv. ♂s; Mafulu, 1 ad. ♂, 1 ad. ♀; Matsika, 1 juv. ♀; no locality, 1 ad. ♂.

Skull as large or larger than *orientalis* from Wetar (84 × 62.5); zygomatic outline about the same or slightly bolder; interorbital ridges equally heavy but only about 15 mm. across and passing smoothly into sagittal crest instead of abruptly; nasals with strongly prolonged anterior tips exceeding notch by 5 mm., their narrowest parts as in *carmelitae*, and their posterior parts comparatively little widened (13 to 13.5); maxillo-frontal contact broad (5 to 5.5 mm.); facial exposure of lacrimal slight (4 to 4.5 mm.); posterior palatal openings slightly less than 33% of palatal length; mastoid breadth about 80 to 85% of zygomatic width; paroccipital processes relatively weak (diameters about 2 × 2.7); exposure of tympanic much masked by lapping over of mastoid from behind and squamosal from glenoid fossa in front; alisphenoid "bulla" very slightly rounded; i¹ remarkably large and heavy, its crown length 2.3 to 3.5, according to age; i² crown, 3.2; i³ crowded between i²

and canine, as in *orientalis*; p^4 peculiarly large and complex with hollow-channeled inner and outer faces and a blade composed of at least 3 serrations, its mass appearing to exceed that of m^1 , its crown dimensions about 6.3×5.6 ; molars relatively small, but with a marked size gradient (from front to back); length m^1 , 5.4; m^2 , 4.8; m^3 , 4.6; m^4 , 4.5, and width m^1 , 4.5; m^2 , 4.4; m^3 , 4.1; m^4 , 3.7.

It has been suggested lately¹ that *leucippus* and *gymnotis* may be synonymous. Both, however, appear to be extremely rare in collections and on the point of their identity further information is desirable. It is very likely that they are at least conspecific.

Whatever the inter-relationships of *gymnotis* and *leucippus*, together they constitute a definite and well-marked section of the *orientalis* group.

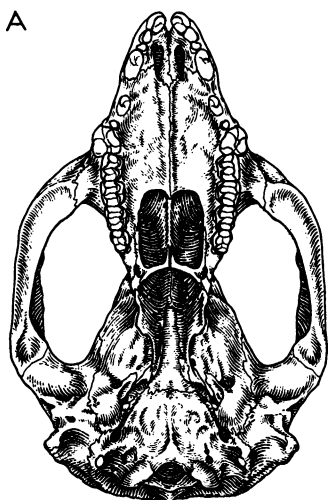
MEASUREMENTS. See pp. 443–444. Skull (Fig. 4 A).

Phalanger sericeus Thomas

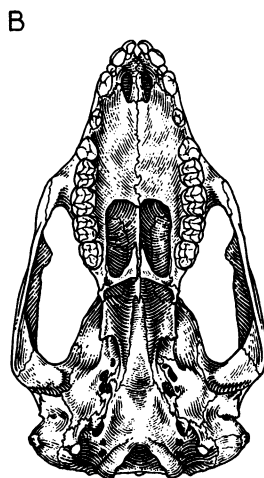
After careful study the conclusion has been reached that the mountain-dwelling, blackish-brown, long-haired phalangers with white underparts, *sericeus* and *coccygis* should be treated as subspecies of one another. The characters of the skull given below, though such as to separate them rather sharply from other species, only just suffice for their distinction from each other. The fact that Thomas repeatedly compared *coccygis* with *carmelitae* may imply very close relationship, but such is apparently not really the case, *carmelitae* being, if anything, more closely allied to *brevinasus*.

The skulls of *sericeus* (and *coccygis*) are pear-shaped, of intermediate size (67×53), the tapered appearance being due to the location of the widest extent of the zygoma at the squamosal; interorbital ledges little separated (10–12); muzzle short and thick, the face anterior to the lacrimals not pinched in; nasals scarcely exceeding the nasal notch (by 1 to 2 mm.) not much expanded behind (12 to 13 mm.); facial exposure of lacrimal considerable (5 mm.); anterior palatal foramina short (5 mm.); posterior vacuities less than 25% of palatal length; mastoid breadth about 80–85% of zygomatic breadth; mastoid and back of squamosal strongly inflated; paroccipital processes relatively long and slender, their tips frequently converging slightly, placed slightly nearer to condyle than to outer tip of mastoid; width across outside of condyles (15.5) decidedly less than distance from margin of foramen magnum to outer tip of mastoid (19); exposure of tympanic very slight (7 mm.) due to extension of "bulla" onto base of paroccipital process; crown of i^2

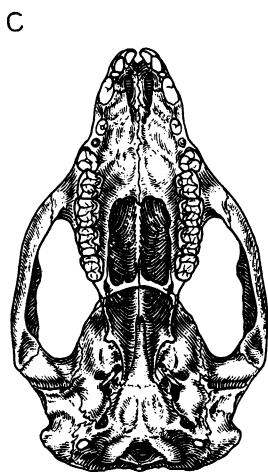
¹ Schwarz, 1934, Proc. Zool. Soc. London, I, p. 87.



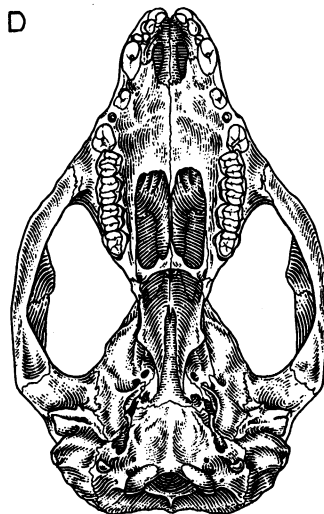
A.M. 104097



A.M. 104090



A.M. 79786



A.M. 80933

H.Z.Hunt

Fig. 4. Palatal views of skulls of (A) *Phalanger leucippus*; (B) *Phalanger sericeus sericeus*; (C) *Phalanger sericeus coccygis*; (D) *Phalanger orientalis orientalis*. 2/3 natural size.

exceptionally large, its length 4 mm.; p^3 often absent; p^4 with hollowed facets not unlike those in *leucippus* but the tooth not unduly enlarged, its crown dimensions 4.6×4.0 ; molars, on the contrary very large in proportion to the size of the skull, with little or no size gradient, m^1 , 5.4×4.6 ; m^2 , 5.3×5.0 ; m^3 , 5.4×4.8 ; m^4 5.3×4.6 . Note the large size of m^4 , the width of whose second loph is 3.8.

Phalanger sericeus sericeus Thomas

Phalanger sericeus THOMAS, 1907, Ann. Mag. Nat. Hist., (7) XX, p. 74.

MATERIAL.—Central District of Papua: Mt. Tafa (2400 meters) 1 ad. ♂, 1 ad. ♀; Murray Pass (4860 meters) 1 ad. ♂, 2 ad. ♀s; 1 juv. ♀.

The type locality of *sericeus* was Owgarra, Angabunga River, "6000 feet," or considerably below the altitude of the places of capture of the present series. Our species appear not to deviate from the description of the type, however, and must be referred to true *sericeus*.

The absence of the usually minute p^3 , pointed out by Thomas, is maintained in every skull of our series.

MEASUREMENTS.—See pp. 442–443. Skull (Fig. 4 B).

Phalanger sericeus coccygis Thomas

Phalanger coccygis THOMAS, 1922, Ann. Mag. Nat. Hist., (9) IX, p. 673.

MATERIAL.—Mandated Territory of New Guinea: Sevia, Huon Peninsula, 1700 meters: 2 ad. ♂s and 4 ads. not marked for sex, virtual topotypes.

The lengthened furred part of the tail and the usual presence of p^3 (one specimen has p^3 absent from one side) suffice for the distinction of *coccygis* from *sericeus*.

MEASUREMENTS.—See p. 442. Skull (Fig. 4 C).

Phalanger orientalis (Pallas)

As stated previously (p. 366) true *orientalis* of extreme west New Guinea and nearby islands is considered possibly derived from a genetic line long distinct from the several island races occurring north and east of the eastern end of New Guinea, for which the name *breviceps* is now employed specifically (p. 374).

The name *interpositus* Stein is used to denote mainland animals from the Weyland Mountain region; *orientalis orientalis* indicating our small series of opossums from Wetar. In default of much more material, the relationships of west New Guinea *orientalis* will not be further touched upon other than to prepare a close analysis of *orientalis* proper for purposes of comparison with eastern forms.

Phalanger orientalis orientalis (Pallas)

Didelphis orientalis PALLAS, 1766, Misc. Zool., pp. 59-62.

TYPE LOCALITY.—Amboina, off southwest coast of Ceram.¹

The American Museum possesses no topotype of *orientalis*, but the external measurements given by Thomas² of specimens "d1" and "d" and the skull dimensions of specimen "e" are data based upon topotypical material.

A series of four skins and four skulls (not correlated with the skins) collected by D. Burden at Wetar constitute the closest approach in our collections to typical *orientalis* of Amboina. The two larger skulls, A.M.80933, 80935 (probably old males) agree remarkably closely in their dimensions (see p. 438) with those listed by Thomas (1888, p. 208) for the skull of a male topotype. They differ in having larger nasals and larger molar teeth. The Wetar skins agree also with described *orientalis* skins, one large one (male ?) showing the yellowish cast about the throat and neck which Thomas mentions. It is believed, however, that Thomas' second measured skull ("x", a female from Port Moresby) is not that of *orientalis* but of the later described *carmelitae* (compare particularly dimensions of nasals).

A female specimen from the Weyland Range, Dutch New Guinea, collected by F. Shaw Mayer and identified as *orientalis* by Dollman,³ may well correspond with *interpositus* Stein⁴ from that identical range (see p. 372).

If the material from Wetar Island can be considered typical of *orientalis*, the cranial characters of adult male *orientalis*, *sensu stricto* may be outlined as follows: skull large (85 × 60) and massive; interorbital ridges 14-15 mm. across but pinched in abruptly to form sagittal crest; zygomata well widened at both maxillary and squamosal roots, widest at level with pterygoids; nasals widening gradually from their middle to level with premaxillo-maxillary sutures, then forming a V-suture posteriorly which terminates on a level with lacrimo-frontal sutures in orbit; tips of nasals exceeding nasal notch by about 3 mm.; facial part of lacrimal reaching 7-8 mm., measured in longitudinal axis of skull; premaxillo-nasal suture from 35% to 60% of maxillo-nasal suture; masseteric ridge of zygoma from middle to slightly below middle of jugal; anterior palatal foramina 14 to 15% of palatal length; posterior palatal

¹ Pallas's description was based entirely on the writings of F. Valentijn ('Oud en nieuw Oost-Indien' . . . 5 vols., Amsterdam, 1724-1726) which dealt with the Moluccas, Amboina, etc. This work has not been seen, but Jentink (Notes Leyden Mus., VII, p. 96, 1885) states that the subject of Valentijn's description came from Amboina.

² 1888, 'Cat. Marsup. Monotr.', pp. 203, 208.

³ Rothschild and Dollman, 1933, Proc. Zool. Soc. London, p. 216.

⁴ 1933, Zeits. f. Säugetierk., VIII, pp. 90-91.

openings 37 to 38% of palatal length; mastoid breadth 75% of zygomatic breadth; mastoid distinctly inflated both anteriorly and posteriorly; paroccipital process short, thick and heavy, placed midway between condyle and styloid process of mastoid; external width across condyles (17 mm.) less than distance from margin of foramen magnum to tip of mastoid tuberosity (19 mm.); exposure of tympanic (from opening of meatal tube to its point of concealment by conjunction of audital part of alisphenoid with mastoid) 9–11 mm.; nearly flat alisphenoid “bulla” excluded from medial wall of glenoid by small nodular portion of squamosal.

Teeth: Incisors 1, 2 and 3 crowded and 3 in contact with canine, crown of i^2 only moderately enlarged, its length about 3.5 mm.; canine very large, not recurved or hook-like as in *breviceps*, an incipient cuspule (a sex character ?) often to be noted on its anterior face; p^4 indistinctly double-pointed, 3-rooted, its mass appearing slightly less than that of m^1 , its crown dimensions about 5.2×4.7 as compared with 5.3×4.7 of m^1 ; p^3 peg-like, normally present; p^1 caniniform. Molars with little appreciable size gradient (about m^1 , 5.3×4.7 ; m^2 , 4.8×4.7 ; m^3 , 5.0×4.8 ; m^4 , 5.2×4.5), in each case the width at the posterior loph slightly less than that at the anterior loph (where measurements were taken), but in m^4 the posterior loph only 3.5 in width.

MEASUREMENTS (additional).—See pp. 438–439. Skull (Fig. 4 D).

***Phalanger orientalis interpositus* Stein**

Phalanger orientalis interpositus STEIN, 1933, Zeits. f. Säugetierk., VIII, pp. 90–91.

MATERIAL.—Weyland Range, Dutch New Guinea: 1 ad. ♀, (Mayer coll. No. 98, 1800 meters); 1 ad. ♂, (Stein coll. No. 578). The latter is a paratype, presumably.

The skins of the two differ mainly in the extensive pure white of the underparts of the male, the female being for the most part grayish brown, with white limited to narrow median stripes on neck and chest. The skulls are much alike, the mastoids being more inflated in the male than in the female.

A few distinctive features only of the skull can be indicated: the smaller size, 74×49.8 compared with 80×52.5 in a Wetar female (supposed); shorter anterior palatal foramina, 5.0 to 6.0 (compare 6.8); i^2 crown, 4.1 mm. Thus, apart from its rather smaller size, the skull of *interpositus* conforms to a high degree with that of *Wetar orientalis*.

MEASUREMENTS.—See p. 439.

***Phalanger brevinasus* Tate and Archbold**

Phalanger brevinasus TATE AND ARCHBOLD, 1935, Amer. Mus. Novit. No. 810, p. 5.

MATERIAL.—Central Division of Papua, Mafulu: 2 ad. ♂s (including the type).

Cranial outline in regard to form of zygomatic parts in full agreement with *Wetar occidentalis*, but skull smaller (78×54 or 55); maxillary part of muzzle above infraorbital nerve opening decidedly more pinched in; nasals markedly different, their anterior tips little pointed and extending little beyond nasal notch (about 2 mm.), posteriorly the V-suture very wide, the narrowest part of nasals just anterior to the premaxillo-maxillary sutures; premaxilla extending well back between

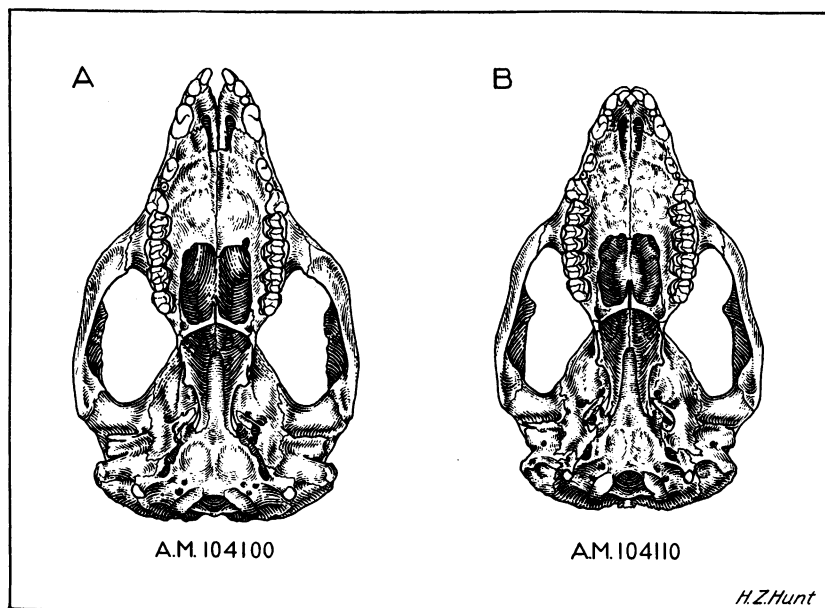


Fig. 5. Palatal views of skulls of (A) *Phalanger brevinasus*; (B) *Phalanger carmelitae*. 2/3 natural size.

maxilla and nasal so as commonly to cause the length of premaxillo-nasal suture (13 mm.) to exceed the maxillo-nasal suture (10 mm.); supraorbital ledges, though massive, narrow (10–12 mm.), formed much as in the Long Island race of *orientalis*; facial part of lacrimal narrow (5 mm.); posterior palatal openings 1/3 length of palate; mastoid only moderately inflated, the suture between mastoid and squamosal, between paroccipital process and styloid process distinct (often indicated by a groove); external width across condyles (16.5 to 17) as in *Wetar orientalis*, less than distance from margin of foramen magnum to

outer tip of mastoid (17–19); exposure of tympanic 8.5 to 9.5, tympanics bounded medially by slightly rounded alisphenoid “bullae” which send slight, irregular processes to make contact with mastoids; i^2 larger (3.8) than in *orientalis* of Wetar; p^3 exceedingly reduced, the largest alveolus measuring 1.3; p^4 rather smaller in mass (5×4) than m^1 (5.1×4.2), and showing less bifurcation of tip; molars rather smaller than those of *orientalis*, with more pronounced size gradient ($m^4, 4.4 \times 3.9$).

MEASUREMENTS.—See p. 433. Skull (Fig. 5 A).

Phalanger carmelitae Thomas

Phalanger carmelitae THOMAS, 1898, Ann. Mus. Civ. Genova, (2) XIX, p. 5.

MATERIAL.—Central Division of Papua, Bellavista, 1450 meters: 1 ad. ♀; Mt. Tafa, 2000 meters: 1 ad. ♂.

TYPE LOCALITY.—Upper Vanapo River, Central District of Papua.

In spite of the possession of a somewhat pear-shaped outline (as in *sericeus*) and generally similar measurements (see tables) the skull of *carmelitae* differs sharply in the short front tip of its nasals and massive muzzle (in those respects resembling *brevinasus*). In addition it has greater mastoid breadth and shorter braincase, the latter resulting in apparent retraction of the entire palatine and pterygoid systems towards the audital and basioccipital region. P^3 is present, as pointed out by Thomas.

The short-haired grayish skins of *carmelitae* contrast sharply with the long, blackish-brown pelts of *coccygis* and *sericeus*.

MEASUREMENTS.—See p. 443. Skull (Fig. 5 B).

Phalanger breviceps Thomas

As pointed out before (p. 366), the phalangers of the *orientalis* group from the islands off the eastern end of New Guinea appear to constitute a somewhat variable but closely allied genetic group, the members of which are more closely allied to each other than any one of them is to true *orientalis* of Amboina. Accordingly, this group of forms has been handled in these pages as a full species, *breviceps*, distinct from *orientalis*, the several island races being treated as subspecies of *breviceps*, namely, *P. b. ducatoris*, *P. b. kiritwinae*, *P. b. intercastellanus*, *P. b. meeki*. The race occurring on Long and Ruk Islands and probably in southern New Britain and on the adjoining mainland has been characterized (p. 377), but it is doubtful whether it rates a subspecific name.

Phalanger breviceps breviceps Thomas

Phalanger orientalis var. *breviceps* THOMAS, 1888, 'Cat. Marsup. Monotr.', p. 204.

MATERIAL.—Malaita Island, 1 ad. ♂, 5 y. ad. ♂s, 1 juv. ♂; Ren-

dova, 1 y. ad. ♂, 2 ad. ♀s, 1 y. ad. ♀, 1 juv. ♀; Komanchi, 1 y. ad. ♀; Molakobi, 1 ad. ♀; Gatukai, 1 juv. ♂, 1 ad. ♀; Ganonga, 2 ad. ♂s, 1 y. ad. ♂, 1 juv. ♂, 1 ad. ♀, 3 y. ad. ♀s, 1 young (pouch); Mono, 1 sub-ad. ♂, 3 juv. ♂s, 1 young ♂ (pouch), 2 sub-ad. ♀s, 1 juv. ♀; Bougainville, 1 sub-ad. ♂, 3 juv. ♂s, 4 ad. ♀s; Nissan, 1 ad. ♂, 1 ad. ♀, 6 y. ad. ♀s; Tabar, 1 ad. ♂, 1 ad. ♀, 1 y. ad. ♀; Lihir, 1 ad. ♂, 1 ad. ♀; Tanga, 1 ad. ♀; Amboi or Rooke Island, 1 ad. ♂; Mungair, 1 ad. (not sexed).

Though smaller (66×44) than those of *ducatoris*, skulls from Malaita are most closely like those of Long Island. Their zygomata, however, not especially widened at orbit; paroccipital process short; mastoid region slightly inflated; outer width across condyles (13.8) only slightly less than distance from edge of foramen magnum to outside of styloid process (15.0); tympanic exposure, 6.5 mm.; teeth with canines and p^1 hooked; p^4 quite small (3.7×3.4); m^1 , 4.9×4.0 ; m^4 , 4.3×3.8 , thus only slightly less than those of the Long Island race.

The material listed above represents a considerable degree of variation. As pointed out by Thomas (1888) variations of color occur from gray to umber brown. The brown phase occurs in our collections from Malaita, Ganonga, Rendova and Bougainville Islands. Specimens from Bougainville have larger skulls and teeth than those of true *breviceps*, but those from Nissan Islands, northwest of Bougainville again have small teeth. The specimens recently brought by Coultas from the small island groups Lihir, Tabar and Tanga (off the north coast of New Ireland) agree with *breviceps* in having fairly small teeth and zygomata anteriorly widened, rather than with *P. b. ducatoris* from south of New Ireland.

MEASUREMENTS.—See pp. 439–441. Skull (Fig. 6 A).

Phalanger breviceps ducatoris Thomas

Phalanger orientalis ducatoris THOMAS, 1922, Ann. Mag. Nat. Hist., (9) IX, p. 680.

MATERIAL.—Northern New Britain (Wide Bay): 1 ad. ♂, 2 ad. ♀s (skins and skulls); 3 ad. ♂s, 1 ad. ♀ (skulls only).

From the Wide Bay region of northern New Britain skulls of old males are proportionately long and narrow (80×50); interorbital ridges wider in front (11.5–13.7) than behind (10.0–13.0), the constriction (8.0–10.5); widest part of zygoma, as in Wetar *orientalis* on level with pterygoids; nasals scarcely pointed in front, their V-shaped posterior ends entering the interorbital trough for a distance of nearly 5 mm.

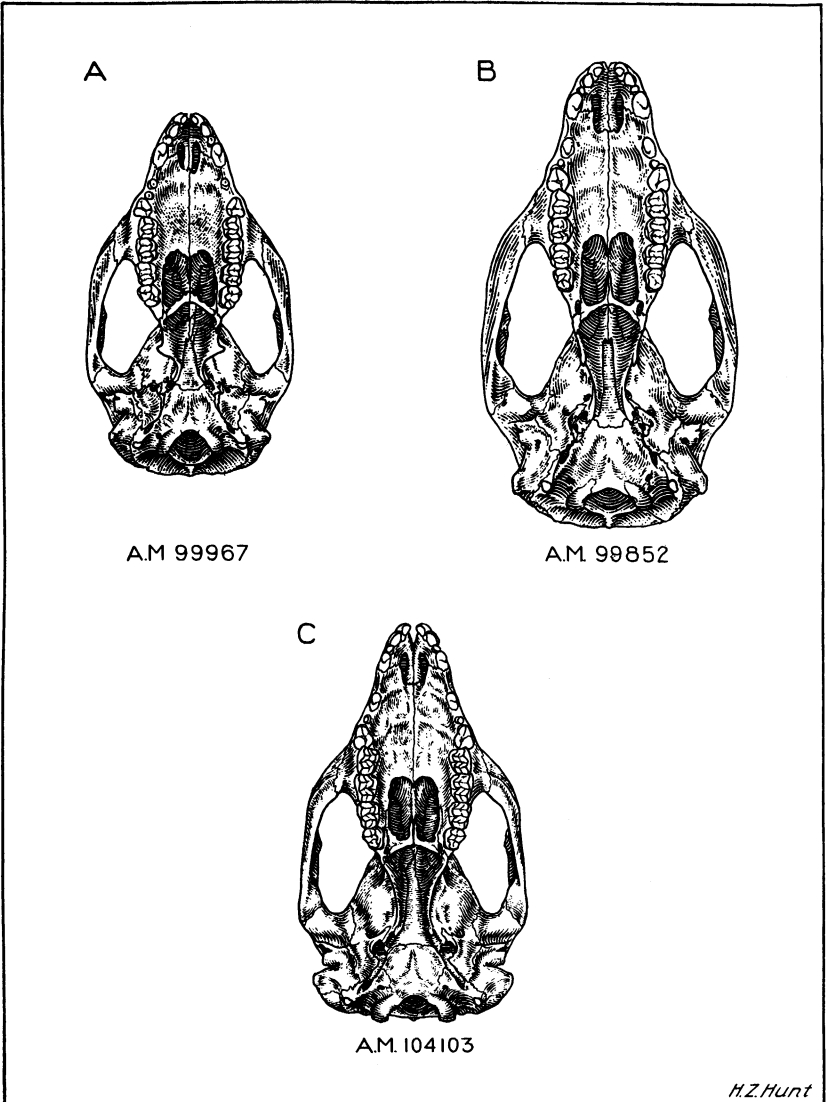


Fig. 6. Palatal views of skulls of (A) *Phalanger breviceps breviceps*; (B) *Phalanger breviceps ducatoris*; (C) *Phalanger matsika*. 2/3 natural size.

behind the level of the lacrimo-frontal suture within the orbit (compare description of *Wetar orientalis*), and nasals thus elongate and narrow (about 36×12.5 . Compare measurements in previously described forms); lacrimal exposure on face as in Long Island form; masseteric ridge in upper half of jugal; length of posterior palatal openings intermediate; mastoid breadth 38 mm. but in proportion to zygomatic breadth; mastoid quite without inflation; paroccipital process distinctly nearer to styloid process of mastoid than to condyle; styloid process, due to lengthening of skull, remote from meatus, center to center 10 mm. (in larger *orientalis* of *Wetar* 8 mm., and in Long Island form only 7 mm.); tympanic exposure 6.7 mm.; teeth generally as in Long Island race, but p^4 , 4.5×4.2 and m^4 , 4.4×3.6 , or longer and narrower.

MEASUREMENTS.—See p. 442. Skull (Fig. 6 B).

From Thomas's description of the skull of *kiriwinae* from the Trobriand Islands, that species would seem to be most nearly related to our long, narrow-skulled form described above. *Intercastellanus* on the contrary was said to be a "pauperized insular form." *Meeki* from the Louisiade Archipelago was described as smaller than *kiriwinae* and as approaching true *breviceps* in size. A juvenal male (A.M.79835) from Tagula Island represents this race. M^1 and m^2 alone have been erupted, the crown of m^1 measuring 5.1×3.7 , that of milk p^4 , 3.5×3.0 . The latter length agrees with an example of young *breviceps* from Malaita Island (p. 440).

A slightly differentiated race of *breviceps* occurs upon Long Island and Ruk Island (near western end of New Britain). Size of old males, small (about 74×52.5); widest expanse of zygoma on a level with orbit, which is wide in proportion to distance across supraorbital ledges, 155% (130% in *Wetar* males); points of nasals blunt, barely exceeding nasal notch; facial part of lacrimal only 4.5 (compare 7 to 8 mm. in *Wetar* males); posterior palatal openings less than $1/4$ of palatal length; external width across condyles (16 mm.) exceeding distance from margin of foramen magnum to tip of mastoid tuberosity (14.8 mm.); exposure of tympanic (compare *Wetar* males) only 7 to 7.5 mm.; alisphenoid "bulla" often slightly concave instead of convex, entering slightly into composition of glenoid fossa; canines distinctly hooked; p^4 (3.7×3.6) much smaller in mass than m^1 (4.9×4.3); molars though all smaller than those of *Wetar* Island animals and with much the same proportions in relation to one another, exhibit a slight though definite gradient, as follows: length m^1 , 4.9; m^2 , 4.7; m^3 , 4.5; m^4 , 3.9; but width m^1 , 3.9; m^2 , 4.0; m^3 , 3.9; m^4 , 3.9. Other measurements, pp. 440-441.

Phalanger matsika Tate and Archbold

Phalanger matsika TATE AND ARCHBOLD, 1935, Amer. Mus. Novit. No. 810, p. 7.

TYPE LOCALITY.—Matsika, Central Division of Papua, 950 meters.

This species, provisionally described under the above reference, is based upon one adult female and a number of juvenal specimens of both sexes. It is a rufous species with teeth only slightly smaller than those of *brevinasus*; posterior palatal vacuities 28 to 29% of the palatal length; mastoid width (39.4) about 90% of zygomatic width (44.8). In practically all other respects except size the skulls resemble those of *brevinasus*. The possibility of *matsika* representing merely females and juvenal males of *brevinasus* has been considered. If such should prove to be the case a pronounced color transformation from young male pelage to adult male pelage must take place.

MEASUREMENTS.—See pp. 444–445. Skull (Fig. 6 C).

Phalanger microdon Tate and Archbold

Phalanger microdon TATE AND ARCHBOLD, 1935, Amer. Mus. Novit. No. 810, p. 8.

TYPE LOCALITY.—Dogwa, Oriomo River, Western Division of Papua, 30 meters.

MATERIAL.—From type locality, 1 ad. ♀, 2 y. ad. ♀s, 1 juv. ♂.

Here, as in *matsika*, adult males are badly needed for purposes of comparison. The several females and the young male, though their skins strongly resemble the skins of the above form, can at once be separated by their much smaller teeth. Inter-orbital ridges 12.7 mm. apart (about 10.0 in *matsika*); nasals exceeding nasal notch by 2 mm.; pre-maxillo-nasal suture, 11.4; maxillo-nasal suture, 8 to 8.5; posterior palatal openings about 33% of palatal length; palate extending well behind m^4 , due to shortness of toothrow; mastoid width (41.7) 87 to 88% of zygomatic width (48.0); i^2 rather small, 2.8; p^4 small, 3.9×3.5 (compare with ♀ *matsika*, 4.8×3.9); m^1 , 4.4×3.8 ; m^4 , 3.8×3.5 (*matsika*, m^1 , 5.0×4.3 ; m^4 , 4.4×3.9).

MEASUREMENTS.—See p. 444.

Phalanger celebensis Group

The single attempt to divide *celebensis* is represented by Meyer's¹ description of *sangirensis*. Meyer's phalanger of Sanghir Is. has currently been referred to *celebensis*. The differences pointed out by him lie

¹ 1896, Abh. Mus. Dresden, VII, No. 6, p. 34.

wholly in coat color and pattern, in consequence of which *sangirensis* is probably best treated as an island race of *celebensis*. No material from Sanghir is available for examination.

Our disagreement with the view of Schwarz¹ that *celebensis* is a subspecies of *orientalis* has already been stated (p. 364).

From the *orientalis* type of skull that of *celebensis* is distinguished by several important characters: the relatively great degree of pinching in of the face on either side of the rostrum; the distinctive form of the mastoid region; the marked reduction in size of the canine teeth together with the well-marked diastema between i^3 and c .

***Phalanger celebensis celebensis* (Gray)**

Cuscus celebensis GRAY, 1858, Proc. Zool. Soc. London, p. 105.

TYPE LOCALITY.—Macassar, Celebes. (Jentink,² besides giving Gray a thorough verbal drubbing for his slipshod taxonomic work, restricted the type locality to Macassar. *Celebensis* as proposed by Gray was composite, being founded upon a juvenal true *celebensis* from Macassar together with two individuals of *breviceps* from San Cristoval, Solomon Islands. Thomas³ designated the Macassar specimen type of the species.)

MATERIAL.—South Celebes: Mt. Lampobatang, Warra Karaing, 2000 meters, 1 ad. ♂; Mengkoka Mts., Tanka Salocco, 2000 meters, 1 ad. ♂. Northeast Celebes: Roeroekan, 700–1000 meters, 4 ad. ♂s, 4 ad. ♀s.

MEASUREMENTS.—See pp. 445–446. Skull (Fig. 7 A).

Phalanger ursinus Group

Three forms *ursinus*, *furvus* and *melanotis* are referable to the present branch of *Phalanger*. The first and second occur in Celebes; *melanotis*, of which we have no specimens, on the Talaud Islands.

The characteristics of this group of *Phalanger* have been outlined already (pp. 364–365).

***Phalanger ursinus* (Temminck)**

The series of topotypical specimens collected by Heinrich (listed beyond), although consisting of rather young individuals, is amply sufficient to be used for comparison with material from other parts of Celebes. After making due allowance for age-differences it has not been possible

¹ 1934, Proc. Zool. Soc. London, pp. 88–91.

² 1885, Notes Leyden Mus., VII, pp. 104–107.

³ 1888, 'Cat. Marsup. Monotr.', p. 207.

to find any character for separation of the much older animals from Lampobatang at the extreme southern tip of the island.

A single sub-adult individual from Latimodjong Mountains at the junction of the southern peninsula with Middle Celebes is referred tentatively to *furvus*, which appears to be merely a nigrescent mountain race of *ursinus*. No differences appear in the skull nor indications that *furvus* is larger than *ursinus*, as stated by its describers. The measurements given show that it is certainly larger than our rather young specimens from Menado but it matches our adult Lampobatang material perfectly.

Phalanger ursinus ursinus (Temminck)

Phalangista ursinus TEMMINCK, 1827, 'Monogr. Mamm.,' I, p. 10.

TYPE LOCALITY.—Menado, northeast Celebes (Jentink, 1885, Notes Leyden Mus., VII, pp. 118–119, may be considered as having restricted the type locality).

MATERIAL.—From North Celebes, Koenersob, Kalabat, Menado District (and therefore topotypical), 1 y. ad. ♂, 5 y. ad. ♀s; South Celebes, Mt. Lampobatang: Warra Karaing, 2000 meters, 1 ad. ♀; and Lambasang, 1100 meters, 1 ad. ♀; locality doubtful, 1 ad. ♂.

MEASUREMENTS.—See p. 446. Skull (Fig. 7 B).

Phalanger ursinus furvus Miller and Hollister

Phalanger furvus MILLER AND HOLLISTER, 1922, Proc. Biol. Soc. Wash., XXXV, p. 115.

TYPE LOCALITY.—Rano Rano, Middle Celebes.

MATERIAL.—From lower Middle Celebes, Latimodjong Mts., 800 meters, 1 y. ad. ♂.

Phalanger maculatus Group

The latest treatment of the *maculatus* group is that by Schwarz.¹ Besides the typical form Schwarz recognizes *P. m. papuensis* (Desmarest) from Waigeu and *P. m. Krämeri* from the Admiralty Islands. When he speaks of treating *ursinus* of Celebes as a "subspecies of *maculatus*" it becomes clear, as indeed the whole tenor of his article suggests, that he has given attention primarily to the skins of those phalangers; for the skulls, apart from a slight similarity in the inflation of their frontals, differ markedly.

In addition to the names cited above, there remain *goldiei*, available

¹ 1934, Proc. Zool. Soc. London, pp. 87–91.

for material from Port Moresby, and *nudicaudatus* of North Australia. *Minor* Cohn from Admiralty Islands would appear to be a synonym of *krämeri* Schwarz; *quoy* Gaimard, *quoyi* Gray and *macrourus* Lesson and Gaimard, all from Waigeu are synonyms of *papuensis* Desmarest (whose description is based on the Gaimard specimen); *chrysorrhous* Temminck from "Les Moluques" is apparently a synonym of *maculatus* Geoffroy; and *ochropus* and *brevicaudatus*, both from Queensland are listed by Iredale and Troughton¹ as synonyms of *nudicaudatus*. *Variegata* Schinz, the original description of which has not been seen, is listed by Cabrera² in the synonymy of *maculatus* Geoffroy. Cabrera's list (*loc. cit.*), showing three races of the *maculatus* group, true *maculatus* ranging from the Moluccas to north Queensland, and the two island races *papuensis* (Waigeu) and *krämeri* (Admiralty), seems to be reasonably arranged, with the possible exception that the species in south New Guinea may be separable from the type form from the Moluccas and that *nudicaudatus* of Queensland may be a good race.

The Archbold collection includes material from Arfak Mts., which comes nearest geographically to the type form; a good series from western Division of Papua; a specimen from Central Division of Papua representing *goldiei* Ramsay; topotypes of *krämeri* (= *minor*); and an individual from Astrolabe Bay north of the Huon Peninsula.

The skulls of these animals are remarkably uniform, exhibiting only minor variations in the size and proportions of the teeth. The series collected by Archbold in south New Guinea (4 ad. ♂s, 3 ad. ♀s), however, exhibits an exceptionally large range of dental variation (p^4-m^4 , 29.5 to 31.7 and one individual ♀, 34.0). The relation of lacrimals to nasals, discussed under *krämeri* by Schwarz³ is not constant for south New Guinea material; in most cases the naso-lacrimonal suture is 4 or 5 mm. in length; in a few there exists a short (1 mm.) fronto-maxillary suture; and in one skull the frontal and maxillary are contiguous on one side and lacrimonal and nasal on the other. In an unusually large skull (A.M.79807) from Astrolabe Bay the fronto-maxillary suture is 3 mm. in length. The same specimen has the nasals unusually elongate backwards, reaching to a distance of 14 mm. behind the fronto-maxillary suture, the resulting V-suture being high and narrow. The same skull as can be seen in the table (p. 448) is exceptionally large in all respects.

In regard to evidence drawn from the pelage of the group (as ex-

¹ 1934, Mem. Austral. Mus. Sydney, VI, p. 32.

² 1919, Gen. Mamm., Mus. Nac. Cien. Nat. Madrid, p. 121.

³ 1910, Sitz.-ber. Ges. Naturf. Freunde, Berlin, p. 408.

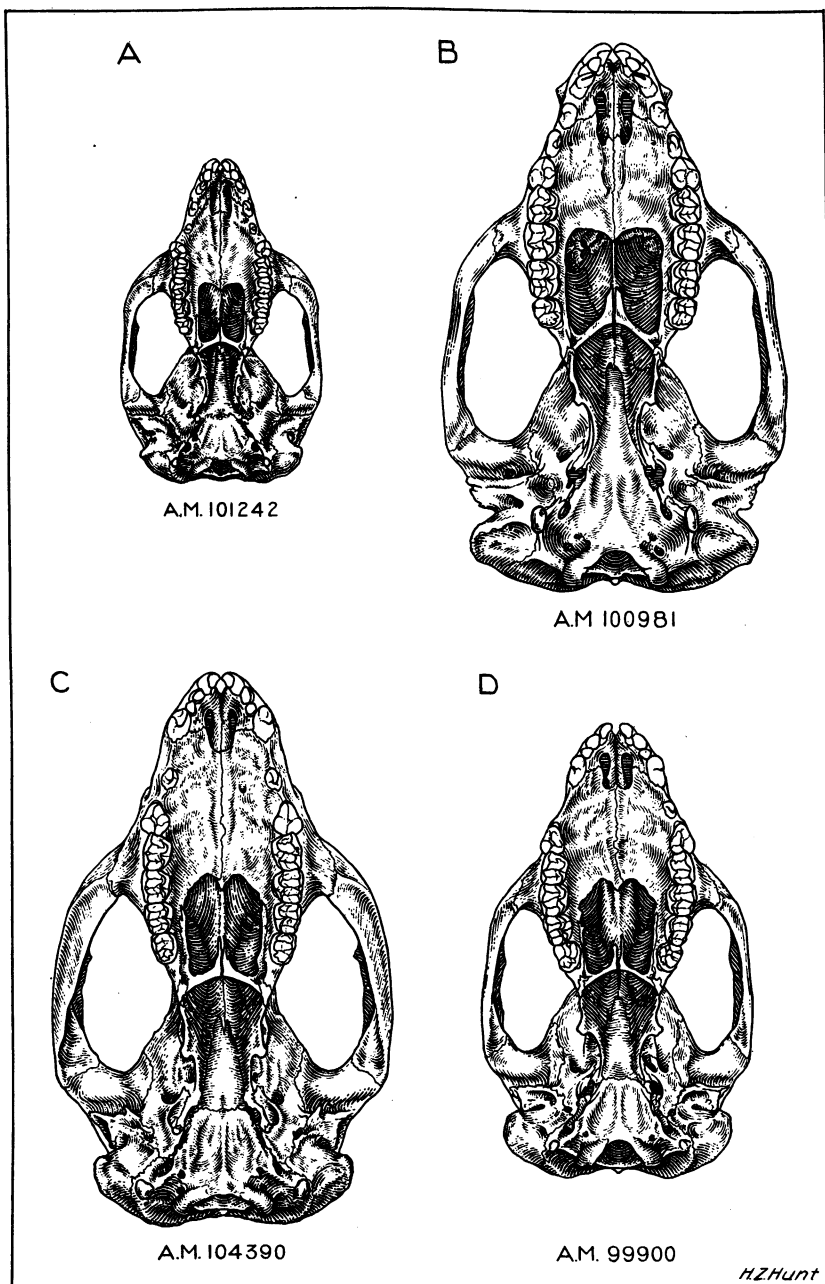


Fig. 7. Palatal views of skulls of (A) *Phalanger celebensis*; (B) *Phalanger ursinus ursinus*; (C) *Phalanger maculatus goldiei*; (D) *Phalanger maculatus krämeri*. 2/3 natural size.

hibited by our material), it must be admitted that *krämeri* appears to be thoroughly and consistently distinct from that of our Arfak and south New Guinea specimens. The male specimen from Astrolabe Bay, see above, is intermediate in regard to its coat. A striking characteristic of *krämeri* in both sexes is the nearly black head on which the cinnamon-colored ears stand out contrastingly, and the deep chestnut-colored fore limbs. The animal from Astrolabe Bay has the normal head of *maculatus*, but the body is spotted with black on the prevailing ochraceous orange ground color, the usual white spots being entirely absent. Possibly this north-coast phalanger should be distinguished as a local race.

Our single female from the Central Division of Papua differs only slightly from the series from the Western Division in having the hair-tips of the arms, sides of neck and shoulders whitened instead of chamois. The animals are otherwise identical. The males of the south New Guinea series have the dorsal maculations blackish brown in contrast to the clear tawny or russet without admixture of blackish to be seen in the Arfak male (true *maculatus* ?) and further, m^4 of the former, though variable, is definitely smaller than m^4 of the latter. For this slightly differentiated race in British New Guinea the name *P. m. goldiei* is available.

Phalanger maculatus (Geoffroy)

Phalanger maculatus maculatus (Geoffroy)

Phalangista maculata I. GEOFFROY ST.-HILAIRE, 1803, 'Cat. Mus. Paris,' p. 149.

TYPE LOCALITY.—"Les Moluques" (Geoffroy).

MATERIAL.—From Momi, Arfak Mts., Dutch New Guinea. 1 sub-ad. ♂, 1 juv. ♀.

MEASUREMENTS.—See p. 448.

Phalanger maculatus (un-named form)

MATERIAL.—From Keku, Astrolabe Bay, Mandated Territory of New Guinea, 1 old ad. ♂.

MEASUREMENTS.—See p. 448.

Phalanger maculatus goldiei (Ramsay)

Cuscus chrysorrhous var. *goldiei* RAMSAY, 1878, Proc. Linn. Soc. N. S. Wales, I, p. 395.

MATERIAL.—From Central Division of Papua, Rona, 750 meters, 1 ad. ♀; Western Division of Papua, Dogwa, Oriomo River, 3 ad., 3 juv. ♂s, 5 ad., 2 juv. ♀s.

MEASUREMENTS.—See pp. 447-448. Skull (Fig. 7 C).

Phalanger maculatus krämeri Schwarz

Phalanger maculatus krämeri SCHWARZ, 1910, Sitz.-ber. Ges. Naturf. Freunde, Berlin, p. 406.

Phalanger maculatus minor COHN, 1913, Zool. Anz., pp. 507-516.

MATERIAL.—Admiralty Islands (Manus Isl.): 1 y. ad. ♂; 3 y. ad. ♀s (all except one ♀ skins only); 3 y. ♂s, 1 y. ♀ (skulls only); 1 ad. albino ♀.

This last specimen is interesting from the fact that heretofore albinism has been recorded commonly in the *orientalis* group and usually in the male sex. That the present animal is a member of the *maculatus* group is attested by its swollen frontals and large teeth, and the complete agreement of the dimensions of the skull with that of *krämeri*. The skin, due to its white pelage, is superficially like a male albino of *breviceps*. The muzzle and the insertions of the superciliary and labial vibrissae are reddish brown (white in *breviceps*), and the skin and hairs of the hands and feet are yellowish (skin slaty in *breviceps*). In addition, the animal is larger and has proportionately much smaller ears than has *breviceps*.

MEASUREMENTS.—See pp. 448-449. Skull (Fig. 7 D).

EUDROMICIA MJÖBERG

Eudromicia MJÖBERG, 1916, Handl. K. Svenska Vetensk. Akad., LII, No. 2, pp. 13-20.

Dromiciola MATSCHIE, 1916, Mitt. Zool. Mus. Berlin, VIII, 2, p. 260.

By his careful analysis of the known species of *Dromicia*, Mjöberg showed conclusively that two of its members, *lepida* and *caudata* should be transferred to a separate genus *Eudromicia*, whose type he designated as *macrura*, described in the same paper as a new species. *Eudromicia* was separated from *Dromicia* (type *Phalangista nana*) on the basis of adequate anatomical characters which need not now be repeated.

A few months later¹ Matschie erected *Dromiciola* with type *D. lepida* which in his key he distinguished from *Dromicia* by its having 3 molars only, its "lower p⁴" very small, and its ear "at least as long as the hind foot without claws." Thus Matschie removed *lepida* from *Dromicia*, leaving therein the type from Atherton Tableland, north Queensland, and *caudata* from Arfak Mts., Dutch New Guinea. Iredale and Troughton (*loc. cit.*) have synonymized *Dromiciola* with *Eudromicia*.

As illustrated by the table of measurements (pp. 449-450) the race of *Eudromicia* living in the Huon region seems to have slightly smaller teeth than has that at Matsika. But on account of present lack of de-

¹ For dates see Iredale and Troughton, 1934, Mem. Austral. Mus., Sydney, VI, p. 23.

tailed information concerning the dimensions of topotypical material, it is not possible to say whether the Huon race or the Papuan race is more nearly equal to the original *caudata*.

Eudromicia caudata (Milne-Edwards)

Dromicia caudata MILNE-EDWARDS, 1877, *Compt. Rend.*, LXXXV, pp. 1079-1080.

MATERIAL.—Central Division of Papua, Matsika, 950 meters, 2 ad. ♂s, 1 juv. ♂, 1 ad. ♀. Mandated Territory, Huon Peninsula, Sevia, 3700 meters, 1 ad. ♀, 2 juvs., sex unknown.

MEASUREMENTS.—See pp. 449-450. Skull (Fig. 8 A).

PETAURUS SHAW

Petaurus SHAW, 1791, 'Nat. Miscell.,' II, pp. 1-4.

GENOTYPE.—*P. australis* Shaw, by monotypy.

Petaurus remained undivided generically until Matschie¹ partitioned it into subgenera, *Petaurus* (restricted); *Petaurula*, with type *breviceps* Waterhouse; and *Petaurella*, with type *papuanus* Thomas. At this time no opinion has been formed by us as to the worth of these subgenera, only one of which, *Petaurella*, is present in the New Guinea region.

Petaurus (Petaurella) papuanus Thomas

Petaurus papuanus, first treated as a form of *breviceps* of the northern part of Australia, has been recorded from a large number of localities in New Guinea and neighboring islands.² Until 1935 no attempt to outline local forms has been made, although Jentink³ suggested some years ago that distinct races might be recognizable. Though the material listed is not nearly adequate for full treatment, it is believed that a beginning can be made with what little is at hand.

The type locality of *papuanus*, Huon Gulf, suggests that Thomas' type was a lowland animal. That idea is borne out by his description "whole of under side yellowish or orange, the hairs not or very slightly grey basally."

The tooth dimensions given by Thomas ($m^{1-3} = 5.4$, and horizontal length of $p^4 = 1.9$) agree almost exactly with those of an adult female from Goodenough Island but less closely with the young male from New Britain. The length of the anterior palatal foramina was 2.5 (in the

¹ 1916, *Mitt. Zool. Mus. Berlin*, VIII, 1, p. 261.

² The race from Aru was termed *ariel* by Gray (1858, *Proc. Zool. Soc. London*, p. 109), which was a homonym of *ariel* Gould (1842, *Proc. Zool. Soc. London*, p. 11) = *breviceps* Waterhouse, 1838.

³ 1917, 'Nova Guinea,' V, p. 371.

type); those of the Goodenough and New Britain specimens are 2.9 and 5.4, respectively. Darkening of ventral pelage (whenever it occurs) seems to be brought about by the presence along each hair of a section colored pale fuscous. The bases of the hairs in all the dark specimens examined are clear buffy yellowish, the tips beyond the light fuscous zone being similarly colored. The darkening just alluded to is barely perceptible in the specimens from New Britain and Goodenough, and in the absence of evidence to the contrary those specimens must be considered as representing Thomas' pair of co-types.

If now the material from the lowlands of the Central Division of Papua is compared with the foregoing, two differences (one very slight and perhaps inconstant) can be noted: the length of the anterior palatal foramen is slightly reduced (2.0 to 2.2); and the dark tinting of the buffy underparts is virtually absent. In view of the essential likeness of the coloration and of the dental dimensions all of the Central Division lowland material should be referred to *papuanus*.

The two specimens from the mountains of the Huon region (1700 meters) and the individual taken by Archbold on Mt. Tafa (2000 meters) diverge rather markedly from typical *papuanus*. The pelage is lengthened, attaining 11 to 12 mm. on the back. (That of lowland *papuanus* is 8 mm.) The banding of the ventral hairs has increased until an appearance of smoky gray with a slight buffy over-wash has been reached, the fur of the scrotum alone remaining white or buffy. In the skull a distinct reduction in the size of the teeth can be observed (see table, p. 452); the palatal openings on the other hand are unaltered. This mountain race has been named *Petaurus papuanus tafa*.

The considerable series from the Oriomo River differs also from typical *papuanus*. The buffy wash present in adults on both dorsal and ventral pelage is intensified, while at the same time no trace of fuscous remains in the ventral fur. The strong fuscous markings of the typical species are modified to brownish fuscous. That part of the band on the crown of the head is often expanded to a diamond-shaped mark whose center is paler. On the fore limb the normal fuscous of the wrist and the metacarpal portion of the membrane is replaced by a mixture of light brown and gray hairs, the former predominating. Juvenal specimens, however, have the dorsal color clear gray, almost devoid of the yellowish cast of adults and the ventral hue only just off white. In skull characters there is substantial agreement with *papuanus* of the Central Division. This race of southern New Guinea has been named *Petaurus papuanus flavidus*.

In specimens from the Weyland Mountains no distinctive characters have been observed, the animals appearing nearly identical to true *papuanus*.

***Petaurus (Petaurella) papuanus papuanus* Thomas**

Petaurus breviceps var. *papuanus* THOMAS, 1888, 'Cat. Marsup. Monotr.', p. 158.

TYPE LOCALITY.—(Thomas, *loc. cit.* p. 159) "Huon Gulf, Eastern New Guinea." The co-types, whose skull measurements were shown by Thomas (*loc. cit.*, p. 162) were an adult male (f) and adult female (j).

MATERIAL.—New Britain, 1 ♂; Goodenough Island, 1 ad. ♂, 1 ad. ♀; Lowlands of Central Division of Papua (Mafulu, Rona, Matsika) 2 ad. ♂s, 1 ad. ♀, 2 juvs.; Weyland Mts., Dutch New Guinea, 1 ad. ♂, 2 ad. ♀s, 1 juv. ♀.

MEASUREMENTS.—See pp. 457–452.

***Petaurus (Petaurella) papuanus tafa* Tate and Archbold**

Petaurus (Petaurella) papuanus tafa TATE AND ARCHBOLD, 1935, Amer. Mus. Novit. No. 810, p. 1.

MATERIAL.—Mt. Tafa, Central Division of Papua (2000 meters), 1 y. ad. ♂; Huon Peninsula (1700 meters), 2 y. ad. ♂s.

A mountain-inhabiting melanistic race in which the molars are definitely smaller than those of the *Petaurus* of the lowlands.

Specimens from Sevia, Cromwell Range, Mandated Territory, 1700 meters, which conform closely to the type form have been referred to *tafa*.

MEASUREMENTS.—See p. 452.

***Petaurus (Petaurella) papuanus flavidus* Tate and Archbold**

Petaurus (Petaurella) papuanus flavidus TATE AND ARCHBOLD, 1935, Amer. Mus. Novit. No. 810, p. 2.

MATERIAL.—Western Division of Papua, Oriomo River, 6 ad. ♂s, 5 juv. ♂s, 12 ad. ♀s, 5 juv. ♀s.

Flavidus is to be regarded as the open-country representative of the lowland *papuanus*. The long series secured by Archbold and Rand in southwest Papua demonstrates that the *Petaurus* of that region is consistently paler and more yellowish than is true *papuanus*. The skull, however, shows no trace of differentiation such as appears in the case of the mountain race *tafa*.

MEASUREMENTS.—See pp. 450–451.

DISTOECHURUS PETERS

Phalangista (*Distoechurus*) PETERS, 1874, Ann. Mus. Civ. Genova, (1) VI, p. 303.

Distoechurus THOMAS, 1888, 'Cat. Marsup. Monotr.,' p. 139.

TYPE (by monotypy).—*Phalangista* (*Distoechurus*) *pennatus* Peters.

This genus, which on account of the arrangement of the teeth and the distichous character of the tail, has usually been considered nearly allied to *Acrobates*, is nevertheless rather markedly distinct. Even in those respects the two genera have little in common. In *Distoechurus* the fourth molariform tooth is absent, and in the premolar series the chief

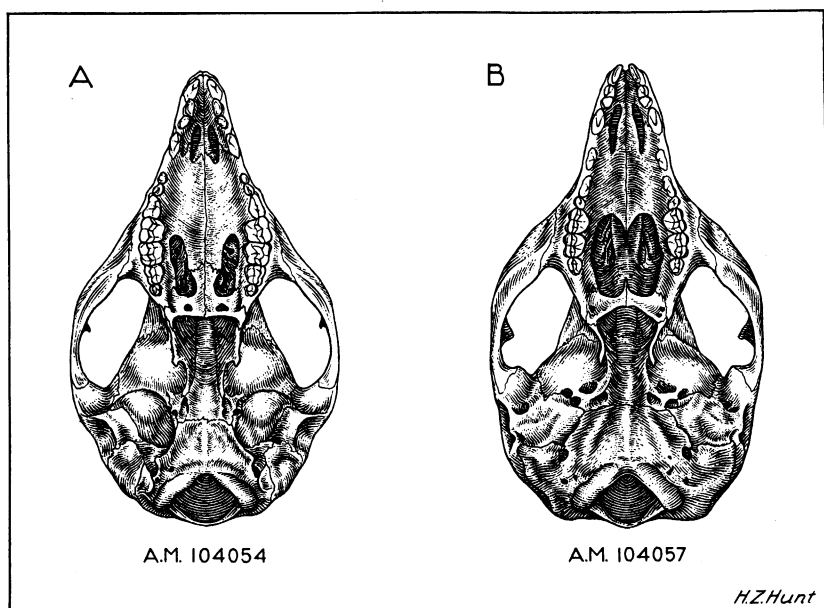


Fig. 8. Palatal views of skulls of (A) *Eudromicia caudata*; (B) *Distoechurus pennatus dryas*. $\times 3/2$.

functional tooth of *Distoechurus* is p^2 , whereas in *Acrobates* the principal premolar seems to be p^3 as in *Eudromicia*, the p^3 of *Distoechurus* being greatly reduced and single-rooted. The distichous tails of *Acrobates* and *Distoechurus* also differ sharply. In the former the slightly stiffened hairs become longer from the base of the tail towards its tip, whereas in *Distoechurus* that condition is reversed, the flat-growing hairs becoming gradually shorter as the end of the tail is reached. The presence of a weak flying membrane in both is, of course, sharply distinctive. In Fig. 8 the skull of *Distoechurus* (B) is compared with that of *Eudromicia* (A).

Distoechurus pennatus appears to be an extremely stable species. After the discovery of the type at Andai, on the east coast of Vogelkop, Dutch New Guinea, no race was distinguished until in 1916 Matschie¹ named *neuhausi* from Sattelberg, Huon Gulf, in the present Mandated Territory. Four years afterwards Thomas² described *D. p. dryas* from Mt. Gayata, Richardson Range, Papua, and *D. p. amoenus* from Rawlinson Mts., Huon Peninsula. The latter was admitted by Thomas, himself,³ to be a synonym of Matschie's *neuhausi*.

Neuhausi was claimed by Matschie to be separable from the western *pennatus* by its somewhat larger size and especially by the larger size of its forward premolars. The same race (under the name *amoenus*) was distinguished by Thomas on the bases of its larger size, more contrasting colors excepting the transition line from back to belly. *Dryas* was considered darker and grayer [than *D. p. pennatus*] and the lines of the head less contrasted.

Four specimens are available for examination: a young adult male from Weyland Range, Dutch New Guinea (Shaw Mayer, No. 153), probably representing true *pennatus*; a juvenal male from Kurasimeri, in the Sepik River district, referable by reason of its strong colors and its geography to *neuhausi*; and an adult female and juvenal male from Kubuna, Central District of Papua, which perhaps represents *dryas*.

Although the above material is inadequate to be of weight as evidence regarding the validity of the local races of *pennatus*, slight differences in color can be noted which seem to support the descriptions. The Weyland animal is paler than the others (near tawny olive) with the black head lines becoming diffuse posteriorly, its under coloring is near cream buff; the juvenal from the Sepik is strongly colored, between buckthorn brown and ochraceous tawny dorsally (with numerous dorsal over-hairs) and from chamois to antimony yellow ventrally; the two specimens from Kubuna can be described as between wood brown and natal brown dorsally and light ochraceous buff ventrally. The black of the facial marks encircles the eye completely, reaching a width at the posterior corner adjoining the post-ocular vibrissae of 2 mm. in the adult female. In the Sepik specimen no enlargement of p^1 , such as Matschie described for *neuhausi*, has been discovered.

Thomas (*loc. cit.*) found p^4 two-rooted and obliquely set in *p. pennatus*; in *p. dryas* single-rooted and oval; and in *neuhausi* (= *amoenus*) single-rooted, circular in section and very small. Examining those

¹ 1916, Mitt. Zool. Mus. Berlin, VIII, p. 292.

² 1920, Ann. Mag. Nat. Hist., (9) VI, pp. 536-537.

³ 1922, Ann. Mag. Nat. Hist., (9) IX, p. 675.

animals in our collection in which p^3 is developed (namely the Weyland animal and the adult female from Kubuna), no divergence in the size of the tooth can be discovered. P^3 of the Weyland specimen, however, if not double-rooted, at least has its main root deeply scored or cleft on the outer side.

In the accompanying table (p. 453) the measurements offer little information that can be interpreted as diagnostic for the three races.

***Distoechurus pennatus pennatus* (Peters)**

Phalangista (Distoechurus) pennatus PETERS, 1874, Ann. Mus. Civ. Genova, (1) VI, p. 303.

Phalangista pinnata RAMSAY, 1877, Proc. Linn. Soc. N. S. Wales, II, p. 12.

Distoechurus pennatus THOMAS, 1888, 'Cat. Marsup. Monotr.,' p. 139.

MATERIAL.—Weyland Mts., Dutch New Guinea, 1600 meters, 1 y. ad. ♂.

MEASUREMENTS.—See p. 453.

***Distoechurus pennatus neuhaussi* Matschie**

Distoechurus neuhaussi MATSCHIE, 1916, Mitt. Zool. Mus. Berlin, VIII, p. 292.

Distoechurus pennatus amoenus THOMAS, 1920, Ann. Mag. Nat. Hist., (9) VI, p. 537.

MATERIAL.—Sepik River area, 600 meters, 1 juv. ♀.

MEASUREMENTS.—See pp. 453–454.

***Distoechurus pennatus dryas* Thomas**

Distoechurus pennatus dryas THOMAS, 1920, Ann. Mag. Nat. Hist., (9) VI, p. 537.

MATERIAL.—Kubuna, Central District of Papua, 100 meters, 1 ad. ♀, 1 juv. ♂.

MEASUREMENTS.—See pp. 453–454. Skull (Fig. 8 B).

DACTYLOPSILA GRAY

Dactylopsila GRAY, 1858, Proc. Zool. Soc. London, p. 109.

GENOTYPE.—*Dactylopsila trivirgata* Gray, by monotypy.

Subsequent to the description of the original species *trivirgata* from Aru Islands, two names, *albertisii* Peters and *angustivittis* Peters and Doria, from Hatam (Arfak) and from Sorong, were proposed, respectively, in 1875 and 1880. In 1888 Milne-Edwards named *Dactylopsila palpator*, which was removed to *Dactylonax* by Thomas in 1910. Further forms, *picta* from Queensland and *melampus* from the Mambare River, New Guinea were described by Thomas in 1908; *hindenburgi* by Ramme, in 1914; *occidentalis*, *biedermanni*, *kataui* and *arfakensis* by Matschie in 1916; and *megalura* by Rothschild and Jordan in 1933.

Angustivittis and *albertisii* have been synonymized commonly with *trivirgatus*.

For the most part the "species" of *Dactylopsila* have been distinguished only by variations in the pattern of the stripes, the skulls being (presumably) so nearly uniform as to offer no structural differences capable of supplementing observed differences in the designs of the pelts. At least those few characters mentioned by writers seem in the main to be without diagnostic values.

Beyond (pp. 454-457) both the published measurements of the named forms and those taken on our own material have been tabulated; and it must be admitted that remarkable constancy of proportion exists throughout most of the series.

Keys to some of the species have been made by Thomas (1908), Ramme (1914) and Matschie (1916).

The *Dactylopsila* material in our collections comprises five lots of specimens, namely Central Division of Papua (*melampus* or *bieder-manni*); south of the Fly River, Western Division (*kataui*); Weyland Mts., Dutch New Guinea; Huon Peninsula (one specimen perhaps referable to *hindenburgi*), and one individual of the distinct *megalaria* from Weyland Mts.

Between the Huon specimen and Archbold's series from Central Papua there appear to be only two appreciable differences in the skins: The transition from gray to black on the under side of the tail is placed in the former near the base, at only 5 cm. from the root of the tail, whereas in all seven of the Archbold animals it occurs half-way between the root and the tip. Secondly, although the hairs on the metacarpal portion of the hands are black in both groups of animals, the digits of the Huon specimen are whitish, while those of the Papuan animals are black. (*Melampus* had occasionally whitish hairs on the fingers, but otherwise black hands.) The white tip of the tail may be present or absent and probably has no systematic significance.

The series of *kataui* taken by Archbold in southern New Guinea (eight specimens) is rather markedly distinguishable from either of those discussed above on account of the narrowness of the tail, due to shortness of the lateral hairs (length of hairs approximately 2 cm., that of *bieder-manni* about 3.5 cm.), and on account of the pattern of the chin region, the black chin mark assuming a nearly circular form, which is sharply and clearly separated by encircling buffy-whitish from the black of the face, in turn restricted to elongate ocular marks not quite reaching the rhinarium. The light cheek-stripe which so markedly divides the black

chin and eye marks in *kataui* is little developed in our Central Division series. It is commonly restricted to a small pale spot by a black bar running from the back of the chin mark to the black base of the ear. The amount of black on the under surface of the tail varies in *kataui*, so judging from comparison of our one Huon animal with the Central District series, the distinction made above may not be constant.

The four specimens from Weyland Mountains partake to some extent of the characters of *kataui* and of the *Dactylopsila* with more densely haired coat at the eastern end of the island (*melampus*). The pattern of their chin-spots is that of *kataui*; on the other hand the tails are rather more densely haired than in *kataui* especially near the body, and have thus a slight taper in outline.

The individuals composing our several series show a rather wide range in intensity of the buffy over-wash of the chiefly gray-based whitish ventral coloration. Furthermore the entire series from Central Division, Papua, shows a narrow median band (width about 1 cm.) of hairs without gray bases, which expands somewhat on chest and neck. In *kataui* that self-colored area is usually expanded to a width of 3 cm.; in the four Weyland specimens an intermediate condition occurs, the band varying from 1 to 2.5 cm. In *kataui* none of the eight specimens has the tip of the tail white, yet three out of the four Weyland skins possess white tail-tips.

In regard to the skulls and teeth of these races a truly remarkable uniformity prevails. After allowing for a small but apparently general amount of individual variation, no character consistently supplementing those slight pelage differences described above has been found. The minute p^3 is apparently deciduous, but our tables giving the crown dimensions of p^4 and of the molars seem to reveal no characters which can be used in taxonomy.

Turning now to *megalaria*, the primary difference as its name implies is to be found in the remarkable development of the hairs of the tail, which attain a length of 8 cm. The tri-linear dorsal pattern of the genus is maintained, but the paler inter-lines are much narrowed and the dark stripes correspondingly widened to produce an effect of more somber coloring. In addition, slight differences are to be noted in the skull: thus, the narrowed muzzle, expressed by the narrow palate with p^1 - p^1 closer together than in other *Dactylopsila*; and the slightly larger m^4 . The smaller size of the skull may be a character of value, but both of Dollman's specimens were females, it must be recalled.

Having seen so few of the named forms, it is not possible to propose

any general arrangement of the genus, but on the basis of material at hand, it may be suggested tentatively (1) that *melampus*, *biedermanni* and *hindenburgi* are variants of a single eastern race which should bear the name *D. trivirgata melampus*, (2) that *kataui* is a valid short-haired, lowland race and should be called *D. t. kataui* and (3) that *megalura* in view of its more pronounced structural characters and co-dweller in the Weyland Mts. with *trivirgatus* should be treated as a full species. Regarding *albertisii*, *angustivittis*, *occidentalis* and *arfakensis*, all with type localities in the Vogelkop area no suggestions can be offered at present.

Dactylopsila trivirgata Gray

Dactylopsila trivirgata trivirgata Gray

Dactylopsila trivirgata GRAY, 1858, Proc. Zool. Soc. London, p. 109.

MATERIAL.—Weyland Mts., Dutch New Guinea, 4 ad. ♀s, 1 juv. ♀.

The above individuals which have been reported upon by Dollman¹ and his identification is here followed. The type locality of the species is Aru Islands. Three forms, *arfakensis*, *albertisii* and *angustivittis* taken on Vogelkop have been described. The relationship of those three to *trivirgatus* cannot be profitably discussed in default of specimens.

MEASUREMENTS.—See p. 456. Skull, audital part (Fig. 9 A).

Dactylopsila trivirgata melampus Thomas

Dactylopsila melampus THOMAS, 1908, Ann. Mag. Nat. Hist., (8) I, p. 122.

Dactylopsila hindenburgi RAMME, 1914, Sitz.-ber. Ges. Naturf. Freunde, Berlin, p. 413.

Dactylopsila biedermanni MATSCHIE, 1916, Mitt. Zool. Mus. Berlin, VIII, Heft 2, p. 303.

MATERIAL.—Sevia, Huon Peninsula, Mandated Territory, 1700 meters, 1 ad. ♀; Central Division of Papua, Deva-deva, 1 ad. ♂, 2 ad. ♀s; Mafulu, 1 ad. ♂; Matsika, 2 ad. ♀s; Baroka, 1 juv. ♀.

MEASUREMENTS.—See pp. 455–456.

Dactylopsila trivirgata kataui Matschie

Dactylopsila kataui MATSCHIE, 1916, Mitt. Zool. Mus. Berlin, VIII, Heft 2, p. 304.

MATERIAL.—Western Division of Papua, Dogwa, Oriomo River, 30 meters, 4 ad. ♂s, 1 juv. ♂, 3 ad. ♀s.

Matschie's type was a juvenal female, in consequence of which some additional notes based on the pelage of adults are now offered. In all of our specimens the hands are black with a few white hairs located dor-

¹ Rothschild and Dollman, 1933, Proc. Zool. Soc. London, p. 215.

sally at the base of the ulna. The general arrangement of the chin mark has been described (pp. 391–392). In most cases the well-marked whitish cheek stripes extend narrowly along the lower lip to meet at the mid-line. The basic color varies both dorsally and ventrally from cream buff to cartridge buff, the ventral color is slightly deeper, becoming almost chamois in specimens with cream-buff faces. The character of the tail has been pointed out already (*loc. cit.*).

This race is to be looked upon as a short-haired off-shoot of that at Weyland Mts., if the forms of the chin-spot and of the tail may be employed as criteria.

MEASUREMENTS.—See pp. 455–457.

***Dactylopsila megalura* Rothschild and Dollman**

Dactylopsila megalura ROTHSCHILD AND DOLLMAN, 1933, Proc. Zool. Soc. London, p. 215.

MATERIAL.—One co-type, field No. 79 (now A.M.101989), the specimen whose skull measurements alone were published by Dollman.

Measurements (additional).—See pp. 455, 457.

DACTYLONAX THOMAS

Dactylonax THOMAS, 1910, Ann. Mag. Nat. Hist., (8) VI, p. 610.

GENOTYPE.—*Dactylonax palpator* (Milne-Edwards).

The relation of *Dactylonax* to *Dactylopsila* in taxonomy has been as follows: Thomas in 1908 placed the single species *palpator* in a distinct branch of his key to *Dactylopsila*. Two years later he segregated *palpator* generically as *Dactylonax*. Ramme, 1914, reduced *Dactylonax* to subgeneric rank, and Cabrera, 1920, re-instated it as a full genus.

Archbold had suspected for some time that with respect to the length of the fourth finger, it might be possible to arrange a series demonstrating a gradient from the normally moderately elongate 4th digit of *Dactylopsila* to the greatly elongated structure present in *Dactylonax*. In the table following, the lengths of the metacarpal and first two phalanges of the fourth finger (approximate only, because measured through the dried skin) are compared for our material representing *Dactylopsila* and for *Dactylonax* and the total lack of such a gradient is readily noted. However, a wide range of variation can be seen in the lengths and proportions of the phalanges in *Dactylopsila*. It is not to be expected therefore that a structure so obviously variable can be of much value in systematic work. Some lengthening of the pedal phalanges, not only of D⁴ and D⁵ of *Dactylonax* but also of the syndactylous D² and D³ has taken place.

Archbold has examined a specimen of *Dactylonax* at Sidney (No. M.5089) whose anterior fourth digit he records as measuring 55 mm.; Milne-Edwards gives (p. 175) 31 mm. (c.u.). The phalanges of D⁴ (c.u.) in our individual of *D. p. ernstmayri* total 37 mm.; the addition of the metacarpal brings a total of 56.5 mm. Doubtless Archbold's dimension included the metacarpal and Milne-Edward's excluded it. In spite of the relative shortness of the finger (31 mm.) in his specimen, the latter called it a "mâle très adulte."

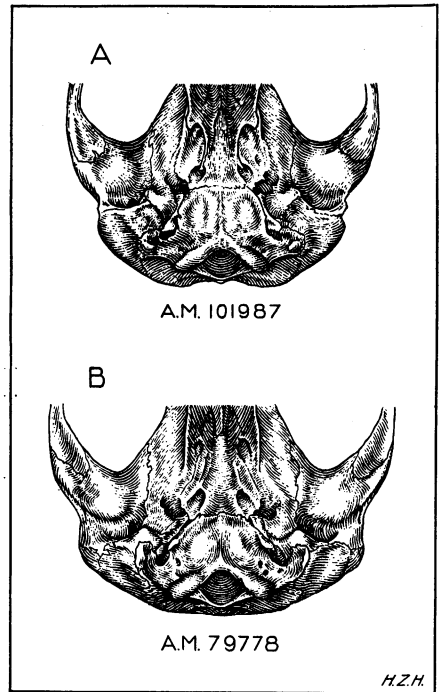
LENGTHS OF JOINTS OF ANTERIOR FOURTH FINGER OF *Dactylonax* AND *Dactylopsila*
(In millimeters)

	Metacarpus	Proximal (first) phalanx	Second phalanx
<i>Dactylonax p. palpator</i> ♀	18	19.5	13.0
<i>Dactylonax p. ernstmayri</i> ♂	19	19.4	14.3
<i>Dactylopsila trivirgata melampus</i>			
Central District ♀	10.2	12.8	9
" " ♀	9	13.5	10.5
" " ♂	9.5	12.0	11
" " ♂	10.3	14.5	9
" " ♀	..	14.5	8.5
" " ♀	..	12.5	9.5
Sevia ♀	12	14.8	12.0
<i>Dactylopsila trivirgata kataui</i>			
Oriomo ♀	11.5	14	9.5
" ♀	12	13.5	10
" ♀	12	13.5	9.5
" ♂	12	14.5	9.5
<i>Dactylopsila trivirgata trivirgata</i>			
Weyland ♀	11	12	10
" ♀	10.5	12	9
" y. ♀	11	13.5	9.5
" ♀	12	13.5	10
<i>Dactylopsila megalura</i> ♀	11	12.5	8.5

In addition to those cranial distinctions from *Dactylopsila* outlined in the original description, a character of the bulla present in our two *Dactylonax* but absent from our series of *Dactylopsila* may be taken note of: In *Dactylopsila* the tympanic bone is scarcely at all exposed on the lower surface of the skull, the alisphenoid forming a partially inflated bulla anteriorly which nearly reaches the mastoid posteriorly. That part of the tympanic which forms the meatal canal is in the same way concealed by the squamosal in front and the mastoid behind, the two bones com-

ing together beneath the tympanic tube and seeming to form an almost closed suture. The meatal opening thus appears as though enclosed anteriorly, above and below by squamosal and behind by mastoid. The true condition has been worked out on a very young *Dactylopsila* skull (A.M.104039). In *Dactylopsila* the low bulla described above bears a roughened process (into the formation of which a very small proportion of the squamosal may enter) for the suspension of the hyoid apparatus. But in *Dactylonax* the condition appears otherwise: Not only does a

Fig. 9. Audital parts of skulls of (A) *Dactylopsila trivirgata*; (B) *Dactylonax palpator ernstmayri*. Natural size.



rather ample portion of the tympanic appear on the lower surface of the skull, but also it is distinctly inflated and carries the roughened surface for the hyoid attachment. That part of the alisphenoid which in *Dactylopsila* goes to form the slight bulla is in *Dactylonax* partly withdrawn forward. The meatal tube is less completely overlaid by squamosal and mastoid. Finally on the outer margin of each basi-occipital where it adjoins the bulla a rather prominent downward-projecting process may be noted in *Dactylonax* which is totally absent from *Dactylopsila*. The drawings (Fig. 9) of the audital parts of the skulls of *Dactylopsila* and *Dactylonax* are intended to illustrate the above-mentioned contrasts.

As pointed out by Milne-Edwards, the tail of *Dactylonax* is notably shorter than in *Dactylopsila*.

***Dactylonax palpator* (Milne-Edwards)**

Dactylonax contains but one species, comprising at present two slightly differentiated races, *palpator* and *ernstmayri*. It appears to be widely distributed through the island of New Guinea, but has been captured so infrequently that its range can be only imperfectly indicated.

***Dactylonax palpator palpator* (Milne-Edwards)**

Dactylopsila palpator MILNE-EDWARDS, 1888, Mem. Soc. Philom. Paris, p. 173.

TYPE LOCALITY.—“South coast of New Guinea.”

MATERIAL.—From Weyland Mountains, Dutch New Guinea, 1 y. ad. ♀ (just received from R. Stein).

This specimen fits Milne-Edwards' description so closely and its measurements are so nearly like those given by that writer that little doubt can remain as to its identity.

From the next race, *ernstmayri*, it differs in its smaller size of cranium, reduced size of p^3 and of molars in general.

MEASUREMENTS.—See pp. 457–458

***Dactylonax palpator ernstmayri* Stein**

Dactylonax palpator ernstmayri STEIN, 1932, Zeits. f. Säugetierk., VII, Heft 6, p. 254.

MATERIAL.—Sevia, Huon Peninsula, Mandated Territory of New Guinea, 1700 meters, 1 ad. ♂.

This specimen agrees perfectly with Stein's short diagnosis in its principal distinctive character, namely a ring of yellowish white around the wrist. It is practically a topotype.

Those cranial characters for *Dactylonax* discussed above were noted from the present specimen.

MEASUREMENTS.—See p. 457. Skull, audital part (Fig. 9 B).

PHASCOLARCTINAE

In spite of the slight superficial resemblance of some of the species of *Pseudochirus* to certain species of *Phalanger*, the opposable second digit of the hand, the structure of the first incisors, reduction of the canines and particularly the selenodont nature of the molars indicate that the true affinities of *Pseudochirus* are with the highly specialized Australian *Phascolarctus*. The two genera must nevertheless have diverged in quite remote times, for the audital region in each has developed along entirely different courses.

PSEUDOCHIRUS OGILBY

Pseudochirus OGILBY, 1837, Mag. Nat. Hist., I, p. 457.

GENOTYPE.—By subsequent designation (Thomas, 1888), *Didelphis peregrinus* Boddaert (= *Phalangista cookii* Ogilby, not Desmarest).

When Thomas¹ dealt with the genus *Pseudochirus* he recognized ten species, four of which—*albertisii*, *schlegeli*, *canescens* and *forbesi*—occur in the New Guinea region. He recognized “three groups, of which *Pseudochirus peregrinus*, *albertisii* and *canescens* may, respectively, be taken as typical,” but did not name them.

Later Matschie² provided subgeneric names for the above groups, *Pseudochirus* (restricted) with type *peregrinus*, *Pseudochirops* with type *albertisii* and *Pseudochirulus* with type *canescens*. He wrote a diagnosis for each subgenus and besides listing the then known species described additional ones. *Pseudochirus* in the restricted sense does not occur in New Guinea but is represented by Matschie's subgenera, *Pseudochirops* and *Pseudochirulus*. In 1916 eight named forms (two, *dahli* and *archeri*, from Australia) were referred to *Pseudochirops* and nine (all from the New Guinea region) to *Pseudochirulus*.

Palatal drawings of several species of *Pseudochirops* may be compared with a number representing *Pseudochirulus* in Figs. 10 and 11.

SUBGENUS PSEUDOCHIROPS MATSCHIE

Pseudochirops MATSCHIE, 1915, Sitz.-ber. Ges. Naturf. Freunde, Berlin, p. 86.

GENOTYPE.—*Pseudochirus albertisii* Peters.

So far as can be determined by checking with descriptions and with the material at hand for study, the members of the subgenus *Pseudochirops* form two natural groups, which may be termed the *albertisii* group and the *corinnae* group. The former is widely distributed over New Guinea; the latter has as yet been found only in the eastern half of the island:

In the *albertisii* group.—*albertisii*, *coronatus*, *paradoxus* (all from Arfak), *insularis*, *beauforti*, *schultzei*, *cupreus*. (For *vulpecula* see p. 400.)

In the *corinnae* group.—*corinnae*, *caecias*, *argenteus*, *bürgersi*.

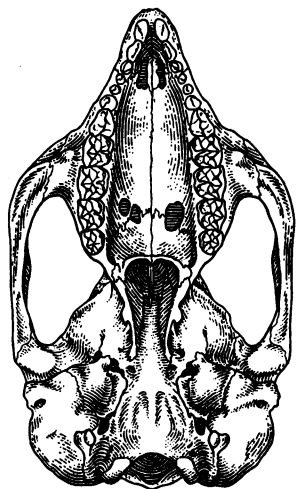
In the *albertisii* group, the ventral surface has white markings, the ears have strong black cilia along their margins, the auditory region is conspicuously enlarged, and the canine is not greatly larger than p¹. In the *corinnae* group, no white markings appear ventrally, no cilia occur on the edges of the ears, the auditory region is little enlarged, and the canine, to quote Thomas,³ is “twice the height and four times the bulk” of p¹.

¹ 1888, 'Cat. Marsup. Monotr.' p. 166.

² 1915, Sitz.-ber. Ges. Naturf. Freunde, Berlin, pp. 83-95.

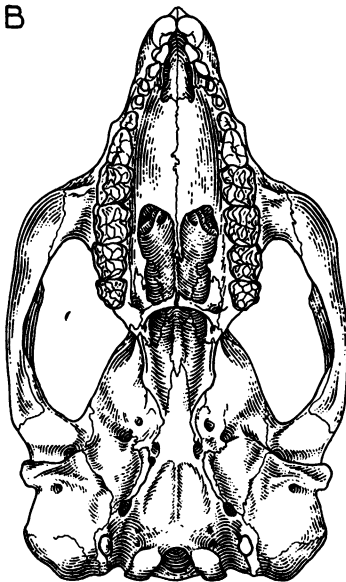
³ 1897, Ann. Mus. Civ. Genova, (2) XVIII, pp. 142-144.

A



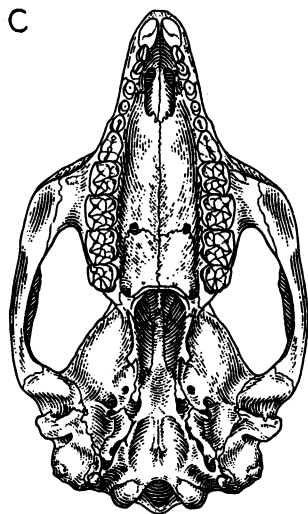
A.M. 100880

B



A.M. 104109

C



A.M. 104116

H.Z. Hunt

Fig. 10. Palatal views of skulls of (A) *Pseudochirus albertisii*; (B) *Pseudochirus cupreus obscurior*; (C) *Pseudochirus corinnae*. 2/3 natural size.

From the tables shown on pp. 458–459 it can be readily noted that true *albertisii* is a small-toothed species extending from the Vogelkop onto the Weyland Mountains and into northern Dutch New Guinea at least as far as Humboldt Bay. Matschie's description of *schultzei* with its small teeth ($m^1-3 = 12.2$), suggests that it too may be closer related to *albertisii* than to *cupreus*. Förster's brief note on the juvenal *vulpecula* from the Sattelburg gives little detail that can be used to allocate it, but Thomas¹ states that it is a *Phalanger*.

The south New Guinea species, i.e., those south of the principal divide, may be recognized by the adpressed condition of the hairs of the distal part of the tail (in *albertisii* those hairs more or less stand out from the skin). Further, an important difference between *albertisii* and *cupreus* is to be seen in the form of the malar arch. In the former the arch springs abruptly from the maxilla, and forms the broad lower rim of the enlarged orbit, whereas in *cupreus* with proportionately smaller orbit the front of the arch is less abruptly developed. This difference results in the greatest width across the zygomata occurring near the front on a level with m^3 in *albertisii*, and in *cupreus* farther back on a level with the hamuli of the pterygoids. Thomas gives no information respecting the character of the malar arches of *beauforti*, but by analogy with the condition of the tail pelage (see above) the arches of *beauforti* may be expected to be like to those of *cupreus*.

***Pseudochirus albertisii* Peters**

Pseudochirus albertisii PETERS, 1874, Ann. Mus. Civ. Genova, VI, p. 303.

Pseudochirus albertisii PETERS AND DORIA, 1874, Ann. Mus. Civ. Genova, XVI, p. 674.

MATERIAL.—Dutch New Guinea, Weyland Range, 1 ad. ♂; Gebroeders Range, 2 ad. ♀s; Sivi, Arfak Mountains, 800 meters, 1 ad. ♂, 1 ad. ♀; Cyclops Mountains, west of Humboldt Bay, 1 ad. ♂.

The specimens from western Dutch New Guinea agree in every way with Peters' description of *albertisii*, and those from the Gebroeders Range have already been so identified by Dollman.² The pair from Sivi, collected by Ernst Mayr, are virtual topotypes of *albertisii*. The fact that the Arfak Range is type locality for three races of *Pseudochirus*, *albertisii* from Hatam, *paradoxus* from 2000 meters, and *coronatus* also from 2000 meters, is likely to cause some doubt as to the validity of those races. From his remark on typical *albertisii*, it is clear that Thomas³

¹ 1922, Ann. Mag. Nat. Hist., (9) IX, p. 673.

² Rothschild and Dollman, 1933, Proc. Zool. Soc. London, p. 216.

³ 1897, Ann. Mus. Civ. Genova, (2) XVIII, p. 144.

regarded it as dwelling in the foothills. Dollman¹ equally clearly considered his *paradoxus* as intermediate between *albertisii* and *coronatus*.

The single male from Cyclops Mts., northern Dutch New Guinea, differs in no appreciable way from *albertisii* of Gebroeders Mts. It is not equivalent to the slightly differentiated *schultzei* from the Sepik region.

MEASUREMENTS.—See pp. 458–459. Skull (Fig. 10 A).

Pseudochirus cupreus Thomas

Besides specimens of true *cupreus*, Archbold and Rand collected a small series of a race which has been described (see beyond) as *Pseudochirus cupreus obscurior*. As indicated in the original notice, *obscurior* occupies the Papuan slopes of the main mountain system of New Guinea between altitudes of 1700 and 2400 meters, and is replaced by *cupreus* from 2500 to about 2900 meters. No specimens of *beauforti* of the southern slopes of the main mountain chain in Dutch New Guinea have been seen, and *obscurior* should be compared with that species.

Pseudochirus cupreus cupreus Thomas

Pseudochirus cupreus THOMAS, 1897, Ann. Mus. Civ. Genova, (2) XVIII, pp. 145–146.

MATERIAL.—Central Division of Papua, Mt. Tafa, 2500 meters, 1 ad. ♂; Murray Pass (Mt. Albert Edward) 2860 meters, 1 ♂ (pouch), 1 ad. ♀; no exact locality, 1 ad. ♂.

Compared with *obscurior*, our *cupreus* is larger, more strongly coppery in color, with larger skull, having the nasals proportionately longer and V-shaped or W-shaped at the back.

MEASUREMENTS.—See pp. 459–460.

Pseudochirus cupreus obscurior Tate and Archbold

Pseudochirus (Pseudochirops) cupreus obscurior TATE AND ARCHBOLD, 1935, Amer. Mus. Novit. No. 810, p. 3.

MATERIAL.—Central Division of Papua, Mt. Tafa, 2070 meters, 1 ad. ♂, 1 ad. ♀ (the type); Mafulu, 1200 meters, 1 juv. ♂.

This form is relatively smaller than *cupreus*. Pelage less coppery and duller and darker in general color; skull smaller, with nasals shorter, and although irregular, generally rounded at the back so as jointly to form a curved suture.

MEASUREMENTS.—See pp. 459–460. Skull (Fig. 10 B).

¹ 1930, Proc. Zool. Soc. London, I, p. 432.

Pseudochirus corinnae Thomas

Pseudochirus corinnae THOMAS, 1897, Ann. Mus. Civ. Genova, (2) XVIII, pp. 142-144.

MATERIAL.—Central Division of Papua; Mafulu, 1250 meters, 1 ad. ♂; Ononge, 1860 meters, 1 ad. ♂; Mt. Tafa, 2400 meters, 1 ad. ♂ (true *corinnae*). Mandated Territory, Huon Peninsula, Sevia, 1700 meters, 1 ad. ♂ (*bürgersi*).

The three specimens listed above from the Central Division of Papua are not only similar among themselves but agree closely with the type description of *corinnae*, which differs from our material only by its slightly longer and wider nasals.

The specimen from the Huon region must be compared with the three races: *caecias* from the Mambaré R., 1000 meters, *argenteus* from Huon (Sattelberg, 1000 meters), and *bürgersi* from Schrader Mts. farther west. Since it is decidedly larger than our *corinnae* and not "more reddish brown" it cannot be referred to *caecias*.¹ *Argenteus*² was described chiefly from the skin, for the type was a juvenal animal. The description of *bürgersi*³ matches that of our individual very closely indeed. The darker bands bordering the pale bands which margin the central dorsal stripe are fairly well marked; the colors for body and tail agree closely with Matschie's description; yet it is fairly obvious from the small body dimensions that Matschie's animal was rather young.

At the same time our Huon specimen is practically a topotype of *argenteus*. On the basis of these facts we suggest that *bürgersi* and *argenteus* may be synonymous, the former representing near-adult pelage, the latter juvenal pelage.

Apart from its greater size the skull of our *bürgersi* can be easily separated from that of *corinnae* by its more inflated auditory parts; the mastoid breadth being 31 mm. against 28 or 29.

MEASUREMENTS.—See p. 462. Skull (Fig. 10 C).

SUBGENUS PSEUDOCHIRULUS MATSCHIE

Pseudochirulus MATSCHIE, 1915, Sitz.-ber. Ges. Naturf. Freunde, Berlin, p. 91.

GENOTYPE.—*Pseudochirus canescens* Waterhouse.

As erected by Matschie *Pseudochirulus* comprised, besides the type *canescens*, the forms *forbesi*, *avarus*, *gyrator*, *larvatus*, *schlegeli* and *bernsteini* (often held to be a synonym of *canescens*). In the same article Matschie described *capistratus* and *barbatus*. Forms subsequently in-

¹ Thomas, 1922, Ann. Mag. Nat. Hist., (9) IX, pp. 674-675.

² Förster, 1913, Zool. Anz., XLII, p. 179.

³ Matschie, 1915, Sitz.-ber. Ges. Naturf. Freunde, pp. 89-91.

cluded are *caroli* Thomas, 1921, *dammermanni* Thomas, 1922, *versteegi* Thomas, 1922, *lewisi* Dollman, 1930, *pygmaeus* Stein, 1932, and *mayeri* Rothschild and Dollman, 1933.

Pseudochirulus may be accepted provisionally as a monophyletic assemblage (as opposed to *Pseudochirops* and *Pseudochirus* subgenera), but it is nevertheless possible to segregate the above-mentioned forms into several markedly distinct groups of species.

Pseudochirus canescens was employed by Waterhouse¹ to name plate 16 of the Atlas of Hombron and Jacquinot.² Waterhouse was ignorant of the locality at which the specimen figured (a female) had been obtained. In the text of Hombron and Jacquinot³ which was published many years later than the account of Waterhouse, the locality of the specimen was given as Triton Bay, which is on the southeast coast of Vogelkop. The body and skull measurements of *canescens* published by Thomas⁴ are stated by him to be those of the type female specimen. Yet under habitat Thomas wrote (*loc. cit.*) "N. W. New Guinea (Sala-watti, Ramoi, etc.)," so apparently he too was ignorant of the type locality of the species.

Plate 16 in Hombron and Jacquinot represents the adult female (type) in color, together with several views of its skull and also a colored drawing of the young one from the pouch with a sketch of its skull. All of the drawings appear to be of high quality. From that plate, and from the detailed descriptions of Waterhouse and Thomas, it appears that *canescens* is a lowland species ("fur short and close") with grayish upper pelage relieved by tawny on the sides of the face and with the underparts grayish white (the hairs probably with gray bases). It thus agrees in general body color with *forbesi*, *larvatus*, *barbatus* and *capistratus*. It differs from *schlegeli* and *lewisi* by the presence of tawny cheek patches, and from *avarus* and *gyrator* by the presence (apparently) of gray bases to the ventral pelage.

The skull (as depicted, *loc. cit.*) possesses well-rounded alisphenoid bullae, as in *avarus* and *gyrator*; its palatine bones are unfenestrated, as in *avarus*; the posterior margin of the orbito-temporal fossa is well separated (by some 5 mm.) from the lambdoidal ridge, as in *forbesi* and most other forms (in *avarus* the posterior margin is almost contiguous with the lambdoidal crest); the orbits are large and their inferior margins, formed by the zygoma, are broadened, causing the widest spread

¹ 1846, 'Nat. Hist.,' I, p. 305.

² 1845, 'Voy. Pole Sud . . . l'Océanie, Atlas.'

³ 1853, 'Voy. Pole Sud . . . l'Océanie,' III, p. 34.

⁴ 1888, 'Cat. Marsup. Monotr.,' pp. 182, 185.

of the malar arches to occur on a level with the orbit instead of farther back on a level with the pterygoids as in most other species (this condition is otherwise known only in *avarus*).

In reviewing the known forms, it becomes clear that two distinct and new species-groups, unknown to Matschie when he proposed the subgenus *Pseudochirulus*, may be set off from the remainder, namely (1) the white-tailed *caroli* and *versteegi* and (2) the pygmy species *dammermanni*, *pygmaeus* and *mayeri*. Of the remainder (the original *Pseudochirulus*) three less easily separated additional groups are recognizable: (1) animals with tawny cheek-marks, enlarged orbits and unfenestrated palatines, i.e., *canescens*, *gyrator* and *avarus*; (2) animals with tawny cheek-marks, normal orbits and fenestrated palatines, *forbesi*, *larvatus*, *barbatus* and *capistratus*; and (3) animals with dull grayish or yellowish, little contrasting cheek-marks, normal orbits and unfenestrated palatines, *schlegeli*, *lewisi* and (possibly) *bernstini*. The foregoing groups may be named, respectively, the *caroli*, *dammermanni*, *canescens*, *forbesi* and *schlegeli* groups.

***Pseudochirus* (*Pseudochirulus*) *caroli* Thomas**

Pseudochirus caroli THOMAS, 1921, Ann. Mag. Nat. Hist., (9) VIII, p. 357.

MATERIAL.—From Gebroeders, Weyland Range, Dutch New Guinea, 2000 meters, 2 ad. and 1 juv. ♂s, 2 ad. ♀s.

These specimens have been recorded already by Rothschild and Dollman.¹ The dorsal area from brow to lumbar region of the juvenal male (collected by Stein) is strongly suffused with sayal brown, adults being as a rule grayer. The males have the inguinal area suffused with antimony yellow, the females much whiter. The tail characters by which Thomas distinguished *caroli* and *versteegi* are inconstant, the white occupying, respectively, 50, 40, 50, 50% of the tail length in our specimens, and the bare area beneath the tail 45, 35, 40, 40% of tail length.

MEASUREMENTS.—See pp. 462–463. Skull (Fig. 11A).

***Pseudochirus* (*Pseudochirulus*) *mayeri* Rothschild and Dollman**

Pseudochirus mayeri ROTHSCHILD AND DOLLMAN, 1933, Proc. Zool. Soc. London, p. 216.

MATERIAL.—Mt. Derimapa, Gebroeders, Dutch New Guinea, 1 ♂, 1 ♀ (co-types, Mayer's field Nos. 71 and 89).

It cannot be doubted that *mayeri*, *dammermanni* and *pygmaeus* constitute a closely related species group, but the status of its members cannot be gone into here on account of lack of material.

MEASUREMENTS.—See p. 463. Skull (Fig. 11B).

¹ 1933, Proc. Zool. Soc. London, p. 216.

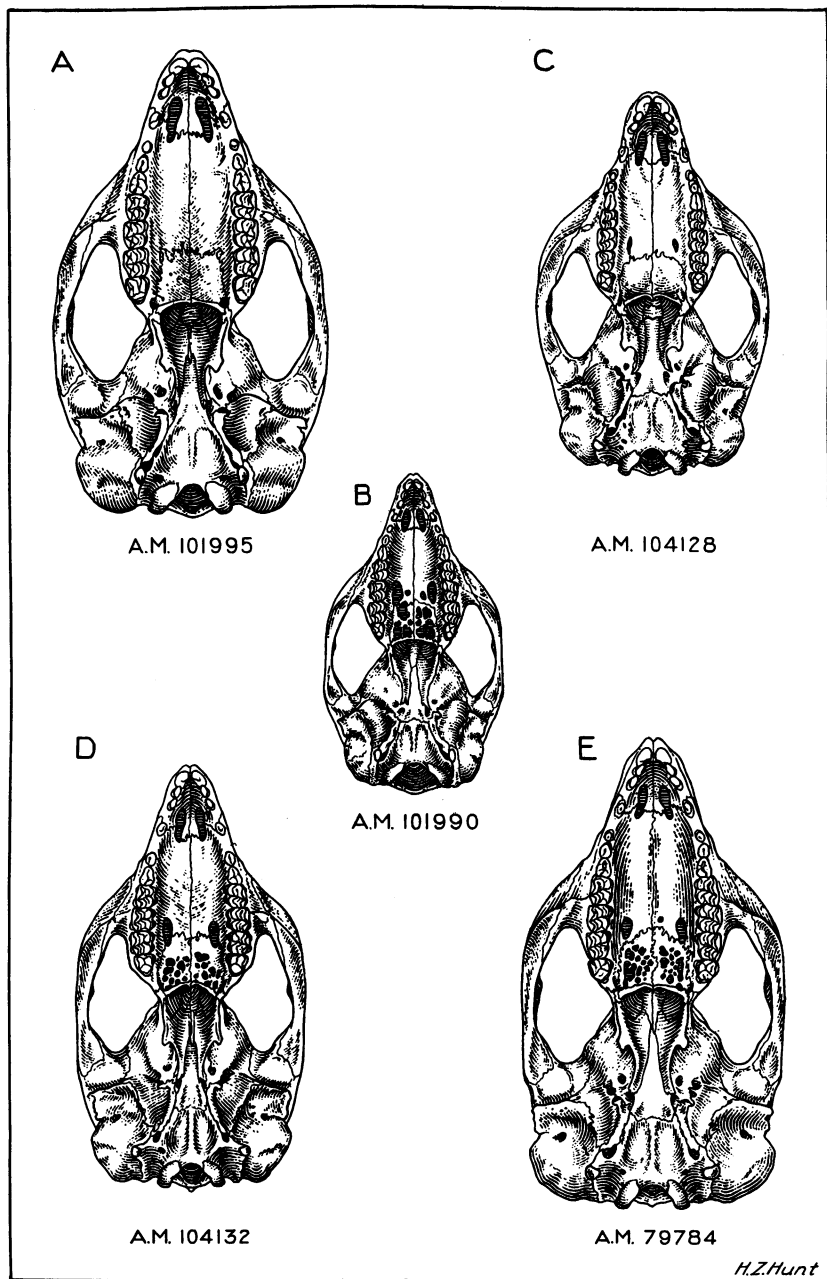


Fig. 11. Palatal views of skulls of (A) *Pseudochirus caroli*; (B) *Pseudochirus mayeri*; (C) *Pseudochirus avarus*; (D) *Pseudochirus forbesi forbesi*; (E) *Pseudochirus larvatus*. Natural size.

Pseudochirus (Pseudochirulus) avarus Thomas

Pseudochirus avarus THOMAS, 1906, Ann. Mag. Nat. Hist., (7) XVII, p. 329.

MATERIAL.—Matsika, Central Division of Papua, 950 meters, 4 ad. ♂s, 3 ad. ♀s.

The present series is characterized by the wide flare of the maxillary root of the zygoma, which causes the greatest zygomatic width to occur on a level with m^3 or m^4 , by the entire palatine bones, and by the clear pinkish cinnamon to cinnamon buff underparts, the hairs of which are self-colored. On the basis of the above three characters *avarus* can be distinguished at once from *forbesi* which is found in the same locality. In the structure and size of the skull it approximates the skull of *canescens* (as depicted by Hombron and Jacquinot, *loc. cit.*).

Apparently *avarus* is very closely allied to *gyrator* from the Gira River (type locality of *avarus*, Port Moresby).

MEASUREMENTS.—See pp. 464–465. Skull (Fig. 11C).

Pseudochirus (Pseudochirulus) forbesi Thomas

Besides the original *forbesi*, a second race, *longipilis*, has been distinguished. Both are dealt with in the pages immediately following. *Forbesi* proper is held to occupy the foothills and subtropics up to 2000 meters, *longipilis* the highland forests from 2000 meters upward.

The characters by which the *forbesi* group is set off from the other two groups of *Pseudochirulus* have been indicated already (p. 404).

Pseudochirus (Pseudochirulus) forbesi forbesi Thomas

Pseudochirus forbesi THOMAS, 1887, Ann. Mag. Nat. Hist., (5) XIX, p. 146.

MATERIAL.—Central Division of Papua, Matsika, 950 meters, 4 ad. ♂s, 2 ad. ♀s, 1 juv. ♂, 2 juv. ♀s; Bellavista, 1450 meters, 3 ad. ♂s, 1 ad. ♀; also from the eastern ridge of Mt. Tafa, 2070 meters, 1 ad. ♂.

Our series of specimens from the upper St. Joseph River region agrees perfectly with Thomas' description of *forbesi* (type locality, Sogere, Astrolabe Range). The skull is in sharp contrast to that of *avarus*, as pointed out already. The widest part of its zygoma is level with the pterygoids and the palatine bones are well fenestrated. The ventral hairs have the bases gray.

The single specimen A.M.104108 (brought in by a native and the locality therefore doubtful) is recorded from Mt. Tafa whence the form next treated also comes. The pelage of this specimen is quite short and similar in length and texture to the specimens from Matsika.

MEASUREMENTS.—See pp. 465–467. Skull (Fig. 11D).

Pseudochirus (Pseudochirulus) forbesi longipilis Tate and Archbold

Pseudochirus (Pseudochirulus) forbesi longipilis TATE AND ARCHBOLD, 1935, Amer. Mus. Novit. No. 810, p. 4.

MATERIAL.—Central Division of Papua, Mt. Tafa, 2225 meters, 1 ad. ♂ (type); 2400 meters, 1 ad. ♂.

The long silky hair of this race separates it readily from true *forbesi*, an example of which was captured only slightly lower down the slopes of Mt. Tafa.

MEASUREMENTS.—See p. 467.

Pseudochirus (Pseudochirulus) larvatus (Förster and Rothschild)

Phalanger larvatus FÖRSTER AND ROTHSCILD, 1911, Ann. Mag. Nat. Hist., (8) VII, p. 337.

MATERIAL.—Mandated Territory of New Guinea, Sevia, Huon Peninsula, 1700 meters, 2 ad. ♂s, 1 juv. ♂.

The type locality of *larvatus* was Rawlinson Mountains, and in consequence our material is nearly topotypical. Förster's type description contained no description of the skull of the type (a juvenal specimen), nor has any description been given in later comments on the species,¹ in consequence of which present identification is based solely upon skin characters. *Barbatus* Matschie² from the Sattelberg Mts., also on the Huon Peninsula, although contrasted by its describer with *larvatus*, seems from its description to be almost if not quite identical to *larvatus*. The differences pointed out (all of pelage) can best be explained through individual variation. *Barbatus* was based upon a skin without skull. No measurements were published. It seems probable that *capistratus* Matschie³ from Mt. Schröder, also founded upon a young animal (♀) which, however, had a skull, is to be regarded as a subspecies of *larvatus*.

Our material (representing *larvatus*), although considerably larger in size, is most closely allied to *forbesi*. The skull is strongly built and has the temporal region much more heavily developed to form an incipient sagittal crest along the parietals, leaving rather deep frontal and post-parietal fossae; but in respect to the form of the orbits, the fenestration of the palatines, the considerable separation of the posterior margin of the orbito-temporal fossa from the lambdoidal crest, *larvatus* is in close agreement with *forbesi* (and in contrast to *avarus*). The skin is that of an animal larger than *forbesi* with heavier feet but a proportionately short tail, whose terminal third has the hairs but little appressed. The

¹ Thomas, 1922, Ann. Mag. Nat. Hist., (9) IX, p. 675; Dollman, 1930, Proc. Zool. Soc. London, p. 432.

² 1915, Sitz.-ber. Ges. Naturf. Freunde, Berlin, p. 93.

³ Loc. cit., p. 92.

texture of the pelage is that of the mountain race *forbesi longipilis*. The head pattern differs from that of *forbesi* rather sharply in the strongly contrasted black circum-oral area with its strong black extension to the front of the ear, in the rather well-developed median black line from frons to nape, and in the well-marked black post-auricular spot. Further, the above pattern outlines fulvous circum-ocular areas of clear, strong color without gray bases to their component hairs. *Forbesi* lacks the black chin of *larvatus*. Its vibrissal areas are dark, and some darkening appears just anterior to the ears whose backs are blackish (in *larvatus* the backs of the ears are tawny).

MEASUREMENTS.—See pp. 467-468. Skull (Fig. 11 E).

MACROPODIDAE

The Archbold Expedition of 1933 is to be congratulated upon its success in assembling excellent series of several species of wallabies, among which may be mentioned *M. (Protemnodon) agilis*, *M. (Thylogale) lauterbachii* and *M. (Thylogale) coxenii*. The last represents a group of wallabies apparently not previously recorded from New Guinea and has recently been distinguished as a new race. The greater part of the collection of *Macropus* was obtained in the Western Division of Papua, south of the Fly River, and of *Dorcopsis* in the Central Division. This report is based upon a total of over sixty specimens, a few of which, however, are represented by skulls without skins.

Of the nine genera listed by Wood Jones¹ only three, *Macropus*, *Dorcopsis* and *Dendrolagus* are known to occur in New Guinea.

MACROPUS SHAW

Macropus SHAW, 1790, 'Nat. Misc.' I, text for pl. 33.

In the recent 'Catalogue of Mammals of Australia' by Iredale and Troughton² the subgenera formerly part of the genus *Macropus* were assigned generic rank as follows: *Setonix*, *Thylogale*, *Wallabia* (see below), *Osphranter*, *Megaleia* and *Macropus*. Of those former subgenera *Thylogale* and *Wallabia* (= *Protemnodon*) only are represented in the fauna of New Guinea.

A certain number of the specimens brought back in the Archbold collection are skulls without skins. Much help in referring those skulls to their several species has been had from the full sets of measurements taken of the lengths and widths of the crowns of the cheek teeth. Not only can single skulls be thus correctly placed, but specimens with as yet only the milk premolars and but one or two molars in place can be quickly recognized. Thus the dimensional characters of the teeth have been found of high diagnostic value for New Guinea species. In the tables of measurements (pp. 469-473) which include a selection from our series the above-mentioned details of the teeth will be found.

The representatives in New Guinea of *Protemnodon (agilis)* and of *Thylogale* (the *brunii*, *brownii* and *coxenii* sections of *Thylogale*) can be distinguished from each other by a number of anatomical characters:

- | <i>Protemnodon (agilis)</i> | <i>Thylogale</i> |
|--|-----------------------|
| 1.—Inflation of that part of the alisphenoid which extends downward along the anterior face of the paroccipital process. | 1.—No such inflation. |

¹ 1924, 'Mamm. S. Australia,' pt. 2.

² 1934, Austr. Mus. Sydney, Memoir VI.

Protemnodon (agilis)

2.—Meso-pterygoid fossa narrower (at base) than ecto-pterygoid fossae.

3.—Third incisor with long blade and notch in outer face near its middle.

Thylogale

2.—Meso-pterygoid fossa as wide as or wider (at base) than ecto-pterygoid fossae.

3.—Third incisor with long or short blade; notch near or at the back of blade.

SUBGENUS **PROTEMNODON** OWEN

Protemnodon OWEN, 1873, Proc. Roy. Soc. London, XXI, No. 141, p. 128; 1874, Phil. Trans. Roy. Soc. London, CLXIV, pt. 1, pp. 274–281.

Wallabia TROUESSART, 1905, 'Cat. Mamm. viv. foss.', Suppl., p. 834, footnote.

Type of *Protemnodon*: *Macropus anak* Owen.¹

Type of *Wallabia*, by tautonymy: *Macropus ualabatus* Lesson and Garnot = *Kangurus bicolor* Desmarest.

Raven,² who has studied the Macropodidae intensively, considers *Protemnodon anak* and the species of *Wallabia* congeneric. He writes (*loc. cit.*, p. 254). . . "(*Protemnodon*), sometimes referred to as the large wallabies . . . *Protemnodon* is characterized by a long tapering tail, moderately long feet, large ears, cheek and hip stripes, palatal vacuities and a groove on the external face of the third upper incisor that divides the tooth into anterior and posterior halves."

Macropus (Protemnodon) agilis papuanus Peters and Doria

Macropus papuanus PETERS AND DORIA, 1875, Ann. Mus. Civ. Genova, III, p. 544.

Macropus papuensis SCLATER, 1875, Proc. Zool. Soc. London, p. 532.

Halmaturus crassipes RAMSAY, 1876, Proc. Linn. Soc., N. S. Wales, I, p. 162.

Macropus agilis THOMAS, 1888, 'Cat. Marsup. Monotr.', pp. 42–43.

MATERIAL.—Papua, Western Division, Oriomo River: 1 fully ad. ♂ (A.M.104383), 1 sub-ad. ♂, 3 juv. ♂s, 9 sub-ad. ♀s, 1 juv. ♀, 8 juv. (skulls only); Papua, Central Division, Rona: 2 sub-ad. ♀s.

In his discussion of the races of *agilis*, Schwarz³ recognized four subspecies, three of which were Australian and one New Guinean (*agilis papuanus*). With *papuanus* (type locality Papuan mainland, near Yule Island, and by Matschie stated to have been collected by D'Albertis and Tomasinelli near Hall Sound) Schwarz synonymized *crassipes* (type locality near Port Moresby). Matschie⁴ concluded on the basis of descriptions in the literature that *papuanus* and *crassipes* were dis-

¹ Owen himself designated no type. He includes in the genus four fossil species, *anak*, *ogmimas* and *roechus*. Palmer (N. Amer. Fauna, No. 23, p. 579) indicated *anak* as type but with a question mark. If Palmer's suggestion be held insufficient designation, *anak* is now designated type of *Protemnodon*. The type specimen of *anak* is a left lower mandibular ramus.

² 1929, 'Encycl. Britt.', 14th Ed., XIII, p. 255, article "Kangaroo."

³ 1910, Ann. Mag. Nat. Hist., (8) V, pp. 164–166.

⁴ 1916, Sitz.-ber. Ges. Naturf. Freunde, Berlin, pp. 43–49.

tinct. It should be remembered, however, that the type of *papuanus* was a very young animal with but one true molar in place, whereas Ramsay's *crassipes* was founded on a young female and an adult male (measurements given for the latter). Cabrera¹ listed *crassipes* in the synonymy of *agilis agilis* and recognized Lönnberg's new race *nigrescens* from northwest Australia.

Our large series from the Oriomo River is remarkably uniform in color, being of a shade slightly warmer than that of the two females from Rona. The latter animals are almost topotypical of *papuanus*, whereas the former seem to approach the form *jardinei* of north Queensland. The average color differences correspond approximately to ochraceous tawny (Oriomo material) and buckthorn brown (Rona material). The former series was taken in February, the latter in March, and since the seasons differ considerably in the two regions, that difference may be partly accountable for the color differences. All of the animals have short hair (dorsal hair, 20–25 mm.); a specimen secured by Raven from the Queensland Museum has the dorsal hair decidedly longer (30–35 mm.) and thicker.

Schwarz (*loc. cit.*) did not make use of ear-coloring in his comparisons: the Queensland specimen mentioned above has scarcely any but tawny hairs on the ears, whereas all of our New Guinea animals have a band of black half an inch in width along the anterior edge, widening to three-quarters of an inch at the tip, and narrowing down the posterior margin to one-quarter of an inch. This blackening of the ears, which encloses a small tawny area near the base, gives the series a characteristic appearance.

MEASUREMENTS.—See p. 469–470.

SUBGENUS *THYLOGALE* GRAY

Thylogale GRAY, 1837, Charlesw. Mag. Nat. Hist., I, p. 583.

TYPE.—*Macropus (Thylogale) eugenii* Gray (a homonym of *eugenii* Desmarest) = *Halmaturus thetes* Lesson.

The wallabies of the subgenus *Thylogale* to be found in New Guinea can be grouped into three distinct sections:

- 1.—Grayish-brown animals with heavy, powerful claws, triangular in section, the claw of the 4th digit of the foot reaching 24 mm. in length and 9 mm. in width at its base; that of the 3rd digit of the hand 17 mm. in length by 6 mm. in width at base; skull with long, slender paroccipital processes (antero-posterior thickness, 3.3 mm.); deep zygoma (depth at level of glenoid, 13.7); a flat-roofed foramen magnum (top of foramen magnum to lambdoidal ridge, 17.7);

¹ 1919, 'Gen. Mamm., Marsup. Monotr.,' p. 148.

anterior palatal foramina short (6.5) and widely spaced (3.5 mm. apart); descending process of maxillary root of zygoma bent outward, hook-like; third upper incisor small, its blade 5.3 mm. in length (but longer than 1st or 2nd), the notch placed on its outer face nearly (1-2 mm.) at the back; permanent p^4 small, its length 133% of length of m^1 (*M. brownii*). No representative of this section occurs in Australia.

- 2.—Chocolate brown animals with narrower claws, rounded in their side to side dorsal contour (but becoming heavy and sub-triangular in section in old animals), the claw of digit 4 of foot, 22 mm. or less in length and 8.5 in width; that of digit 3 of the hand, 16.3×6 ; skull with relatively shorter, thicker paroccipital processes (antero-posterior thickness, 4.5 mm.); shallow zygoma (depth at level of glenoid, 11-12 mm.); a high-arched foramen magnum (top of foramen magnum to lambdoidal ridge, 13.5 mm.); anterior palatal foramina longer (8 mm.) and closer together (2.8 mm. apart); descending process of maxillary root of zygoma not strongly hook-like; third upper incisor large, its blade 6.2 mm. in length, the notch placed at the back of the tooth; permanent p^4 long, its length 138% of length of m^1 .

This section is again divisible into short-furred lowland species, *brunii*, *lauterbachi* and long-haired mountain forms, *keysseri* and *lanatus*. The mountain animals can be told easily from the lowland ones by the presence of long buffy hairs inside and around the base of the otherwise blackish ears. The section appears to be unrepresented in Australia.

- 3.—Dark grayish animals with rufous legs, and with claws short and wide, the claw of digit 4 of foot, 18×7.5 , of digit 3 of hand, 12×4.5 ; skull sharing characters of sections 1 and 2: paroccipital processes slender, as in *brownii*; zygoma at glenoid shallow (9.0); foramen magnum with high-arched roof (top of roof to lambdoidal ridge, 13 mm.); anterior palatal foramina much as in *brownii*, but posterior openings much larger (18-19 mm.) than in either of previous sections (13 mm.); descending process of maxillary zygomatic root not hooked; i^3 essentially as in section 2; permanent p^4 large (146% of length of m^1). The New Guinea representative of the red-legged padymelons of Australia. (*M. coxeni oriomo*.)

It must be borne in mind that the claws of all the above *Thylogale* are narrower and smoothly rounded in young specimens but become coarser, broader and sub-triangular in section as the animals grow old.

From Miklouho-Maclay's¹ descriptions of *jukesii* and *gracilis* it has been concluded that the former of those wallabies, both of which have been referred customarily to the synonymy of *brownii* may have nothing to do with that species, but instead may belong to the section in which are included *brunii* and *lauterbachi*.

The claws of *gracilis* are described as "long and sharp," that of the middle finger 17 mm. and of the fourth toe 32 mm. In *lauterbachi* those claws measure 11-12 and 19-20 mm., and in our *brownii* 17 and 26 mm., respectively. There exists a decided difference in the characters of the

¹ 1884, Proc. Linn. Soc. N. S. Wales, IX, pt. 4, pp. 891, 894.

claws of these two animals, and in that respect *gracilis* must be ranged with *brownii*. Again, the upper surface of the tail of *gracilis* had hair on the basal third only. In *brownii* that condition obtains also, whereas in *lauterbachi* the body hair extends almost to the tip of the tail. From Maclay's rough drawings of the incisors of *gracilis* and *jukesii* no characters of value can be noted. The measurements of *gracilis* show it to have been a much larger wallaby than *jukesii*. For example, "tip of nose to base of tail" equals in *gracilis*, 725; in *jukesii*, 635; in *brownii*, 667; and in *lauterbachi*, 524. A discrepancy occurs, however, in Miklouho-Maclay's description of the underparts of *gracilis*, "underside, from chin to the end of the tail, of a light grey color." *Brownii* is yellowish white beneath.

Turning now to *jukesii*, the following characters shared by *lauterbachi* can be noted (in addition to those already stated): "Tail slender." Compared with *brownii* this is noticeably the case. "No white tips to the tail" is not constant, for in some of our *lauterbachi* the tail is tipped with yellowish white. The description of the posterior position of the notch of i^3 in *jukesii* agrees entirely with the condition seen in *lauterbachi*. In *brownii*, on the contrary, although placed far back on the blade, the notch is definitely visible from the side. "The anterior cusps of premolars . . . are the most distinct and the most pointed" is clearly true of *lauterbachi* and only doubtfully so of *brownii*.

In conclusion then, it seems probable that, in spite of opinions to the contrary, Miklouho-Maclay had before him distinct species when he described *jukesii* and *gracilis*, the former related to *lauterbachi*, the latter to *brownii*. That point can very possibly be verified by the authorities (at Sydney ?) who have charge of the material on which he worked. In the event that such were the case the name *jukesii* would probably displace *lauterbachi*.

M. tibol Miklouho-Maclay¹ appears to be a *lauterbachi* wallaby also. The slender fore claws, the posterior position of the notch of i^3 , the "chocolate-brown" color of the fur confirm this. Maclay called his two specimens "adult males" but the condition of the teeth and the open sutures shown figured on his plate tend to refute that statement. *Tibol* was apparently a juvenal *jukesii*.

The synonymy of these animals may ultimately be written:

M. brownii = *lugens*

M. brunii jukesii = *tibol* = *lauterbachi*

¹ 1885, Proc. Linn. Soc. N. S. Wales, X, pts. 1-2, p. 141.

But until such time as the point can be conclusively settled the latter must be left under the name *lauterbachi*.

Macropus (Thylogale) brownii (Ramsay)

Halmaturus brownii RAMSAY, 1877, Proc. Linn. Soc. N. S. Wales, I, p. 307.

Macropus lugens ALSTON, 1877, Proc. Zool. Soc. London, p. 126.

(?) *Macropus gracilis* MIKLOUHO-MACLAY, 1885, Proc. Linn. Soc. N. S. Wales, IX, p. 894.

MATERIAL.—New Britain, Maulo River, Wide Bay, 1 ad. ♂.

This fine specimen agrees well with the descriptions of *brownii* and of *lugens* (although the dorsal color in the plate of *lugens* is too dark). There is, however, one feature in the color pattern of our specimen of which neither Ramsay nor Alston made mention, namely the very pale color of the upper and outer sides of the fore arms. This color can be described as drab, and it contrasts strongly with the color, near natal brown, of hands and shoulders. A yellowish color patch on the dorsum of the base of the tail, rather similar to that of *Dendrolagus dorianus*, but smaller, must also be noted.

The skull of *brownii* differs sharply from the externally rather similar *lauterbachi* (see beyond) by the decidedly shorter crown of p⁴.

MEASUREMENTS.—See p. 471.

Macropus (Thylogale) brunii (Schreber)

Didelphis brunii SCHREBER, 1777, 'Säugethiere,' III, p. 551.

This wallaby, whose name was based by Schreber on a description by de Bruyn¹ of animals seen by him in the Batavia menagerie, has been shown to be an inhabitant of Kei, Aru and (doubtfully) western New Guinea. By early authors, including Waterhouse,² it was frequently confused with *Dorcopsis*, but a careful study by Garrod³ cleared up all misconceptions in that respect. Peters and Doria⁴ and Thomas⁵ believed the species restricted to the islands of Aru and Kei; nor is there any allusion to true *brunii* from the New Guinea mainland since that time. It becomes a matter of considerable interest, therefore, to find that Archbold took a number of specimens allied to the species *brunii* in the Western Division of Papua.

The illustrations of the teeth depicted by Garrod (*loc. cit.*, Pl. IX, figs. 11–15) and also Thomas' illustration (*loc. cit.*, Pl. VIII, fig. 4) of the rostrum agree with our series of the crania of *brunii*. In cranial meas-

¹ 1714, 'Reize ov. Moskovie door Perzie en Indie,' p. 374, Pl. cccxiii.

² 1846, 'Nat. Hist.,' I, pp. 180–184.

³ 1875, Proc. Zool. Soc. London, pp. 48–59.

⁴ 1880, Ann. Mus. Civ. Genova, XVI, p. 685.

⁵ 1888, 'Cat. Marsup. Monotr.,' p. 50.

urements our material runs a little smaller than those published by Thomas, perhaps due to immaturity; and the teeth of our animals exceed in size the teeth of the "aged ♀" measured by Thomas.

Checking our material as well as possible with *lauterbachi* Matschie from Finsch Harbor, Huon Peninsula, a further very close approximation is found (see tables, pp. 470-471). Indeed, Matschie's description of the skin in *lauterbachi* matches our specimens in all particulars, except the color of the side of the head which is described in *lauterbachi* as "just as dark as the crown." On the other hand *brunii* was said to have "a well-marked white whisker mark . . . a well-marked white hip-stripe . . . throat, chest and belly white, faintly tinged with brown."

In view of the close agreement of the above forms with our material, it is suggested that eastern and western races of a single species are involved, which may now be called, respectively, *M. brunii brunii* and *M. brunii lauterbachi*. (The possibility that *lauterbachi* may itself be a synonym of *jukesii* Maclay and of *tibol* Maclay has already been advanced (p. 413).) Our south New Guinea animals are referred to *lauterbachi*.

These short-haired, relatively lowland animals should not be confused with the long-haired mountain-inhabiting forms *keysseri* and *lanatus*, though it is quite likely that they represent fairly recent offshoots from common ancestry. The lowland species have heavier teeth, especially i^3 and p^4 . (*Brownii* from the Solomon Islands is considerably different from either, having much smaller teeth, particularly its incisors and permanent p^4 , a decidedly broadened muzzle and its foramen magnum of distinctive shape.)

If the above surmise should prove correct, these short-haired chocolate-brown wallabies will prove to be a New Guinea species (*lauterbachi*) with one island-inhabiting representative to the west (*brunii*) though without representation (as yet recorded) in north Australia. However, due to precedence of discovery the species must carry the name of the island race.

Macropus (Thylogale) brunii lauterbachi Matschie

Thylogale lauterbachi MATSCHIE, 1916, Mitt. Zool. Mus. Berlin, VIII, pp. 290-292.

MATERIAL.—Papua, Western Division, Oriomo R., 3 sub-ad. ♂s, 2 juv. ♂s, 3 sub-ad. ♀s, 1 juv. ♀.

The animals of this series are referred provisionally to *lauterbachi*, though they differ very slightly from that form, as described, in having the sides of the head somewhat paler than the crown.

MEASUREMENTS.—See pp. 470-471.

Macropus (Thylogale) keysseri keysseri Förster and Rothschild

Macropus keysseri FÖRSTER AND ROTHSCILD, 1914, Nov. Zool., XXI, pp. 261–262.

TYPE LOCALITY.—Ogeramnang, 1800–2000 meters, Huon Peninsula.

Macropus (Thylogale) keysseri lanatus Thomas

Macropus keysseri lanatus THOMAS, 1922, Ann. Mag. Nat. Hist., (9) IX, p. 670.

MATERIAL.—New Guinea (Mandated Territory), Sevia, Huon Peninsula: 1 sub-ad. ♀; Papua, Central Division, Wharton Range, Murray Pass, 2850 meters: 1 ad. ♂, 1 sub-ad. ♂.

TYPE LOCALITY.—Saruwaged Mts., 3000–3800 meters, Huon Peninsula.

The specimen from Sevia corresponds entirely to Thomas' description of *lanatus*. It shows very distinctly the "nuchal mantle of light brown hairs separating the blackish crown from the dark brown back." Archbold's two individuals from Murray Pass differ from the Sevia animal to a minimal degree only. They lack a slight russet tone along the line of transition from dorsal to ventral color which is visible in the latter. In the lack of a distinctively colored "mantle" they are like true *keysseri*; but Förster's expression "from there on [about 10 cm. behind the forelegs] the back becomes even darker, reaching a shiny black brown" would seem to imply an incipient "mantle" in *keysseri* too.

The skulls of the Sevia and Murray Pass animals are remarkably alike both anatomically and in dentition, and further, they approximate our series of *lauterbachii* rather closely.

MEASUREMENTS.—See p. 472.

Macropus (Thylogale) coxeni Gray**Macropus (Thylogale) coxeni orio** Tate and Archbold

Macropus coxeni orio TATE AND ARCHBOLD, 1935, Amer. Mus. Novit. No. 804, p. 1.

MATERIAL.—Papua, Western Division, Oriomo R.: 4 ad. ♂s, 1 sub-ad. ♂, 1 juv. ♂, 2 juv. ♀s.

This series, taken by Archbold at Wuroi, on the Oriomo River, constitutes the first record in New Guinea of the group of *Thylogale* with rufous legs and underparts, to which *coxeni*, *stigmatica* and *thetis* belong. The case furnishes yet one more example of overlap of the north Australian fauna into southern New Guinea. The animals appear to be mainly nocturnal, for most of them were shot by the aid of the jack-light.

MEASUREMENTS.—See pp. 472–473.

DORCOPSIS SCHLEGEL AND MÜLLER

Dorcopsis SCHLEGEL AND MÜLLER, 1839-1844, 'Verh. Nat. Ges. Nederl.,' p. 130.

GENOTYPE.—*Dorcopsis mülleri* Garrod = *Didelphis brunii* Quoy and Gaimard, by subsequent designation, Thomas, 1888.

The important studies of *Dorcopsis mülleri* and *Macropus brunii* by Garrod¹ drew attention to the differences and parallelisms between these two genera. When Thomas² dealt with *Dorcopsis* only three species, *mülleri*, *luctuosa*, both *Dorcopsis*, *sensu stricto* and *macleayi*, now type of *Dorcopsulus*, were recognized. Matschie's³ review twenty-eight years later resulted in the separation of *Dorcopsulus* as a subgenus for reception of the small and rather well-differentiated *D. macleayi*. Cabrera⁴ ignored *Dorcopsulus* but Thomas,⁵ with some misgivings, made it a full genus. Palatal drawings representing the two subgenera appear in Fig. 12.

Their principal history, together with additional species included from time to time, may be readily noted from the following outline:

Dorcopsis, subgenus

brunii Quoy and Gaimard, 1830

= *mülleri* Garrod, 1875

subsp. *mysoliae* Thomas, 1913

lorentzii Jentink, 1908

rufolateralis Rothschild,⁶ 1898

luctuosa d'Albertis, 1874

= ? *chalmersi* Miklouho-Maclay, 1884 = *beccarii* Miklouho-Maclay, 1885

hageni Heller, 1896

subsp. *caurina* Thomas, 1922

Dorcopsulus, subgenus

macleayi Miklouho-Maclay, 1885

vanheurni Thomas, 1922

rothschildi Thomas, 1922

Just as with *Macropus*, it has been convenient for the purpose of identifying odd or mismatched skulls of *Dorcopsis* to draw up a complete set of the lengths and breadths of the crowns of the cheek teeth. Such tables (see tooth measurements, pp. 473-474) strongly emphasize the distinctness of the small animals composing *Dorcopsulus* from those larger species retained in *Dorcopsis*.

¹ 1875, Proc. Zool. Soc. London, pp. 48-59.

² 1888, 'Cat. Marsup. Monotr.,' pp. 86-92.

³ 1916, Sitz.-ber. Ges. Naturf. Freunde, Berlin, pp. 51-57.

⁴ 1919, 'Gen. Mamm., Marsup. Monotr.,' p. 155.

⁵ 1922, Ann. Mag. Nat. Hist., (9) IX, p. 672.

⁶ *Aurantiacus* Rothschild has been shown by Schwarz, 1910, Ann. Mag. Nat. Hist., (8) V, p. 165, to equal *Macropus agilis*.

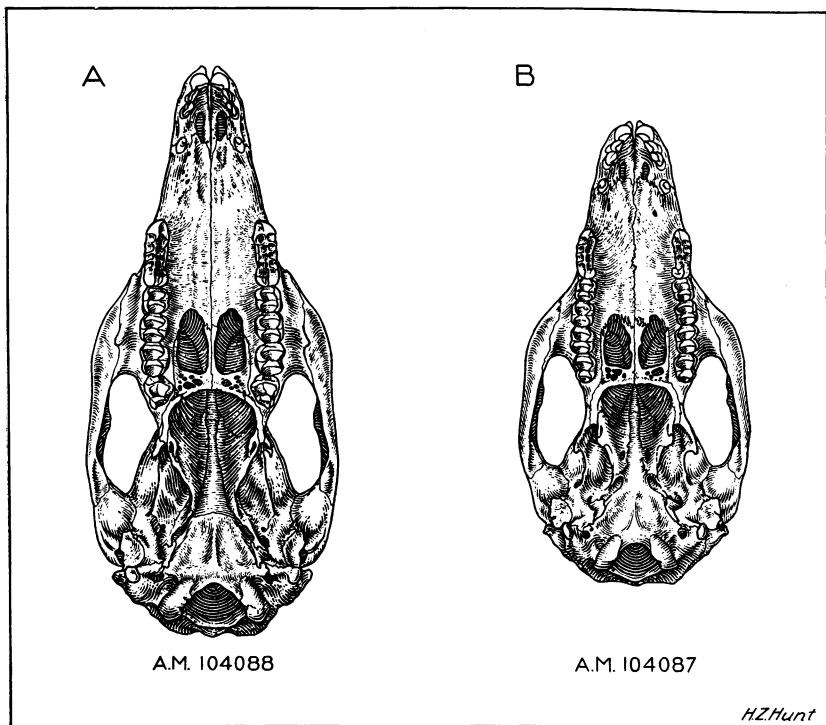
Dorcopsis (Dorcopsis) luctuosa (d'Albertis)*Halmaturus luctuosus* D'ALBERTIS, 1874, Proc. Zool. Soc. London, p. 110.*Dorcopsis chalmersi* MIKLOUHO-MACLAY, 1884, Proc. Linn. Soc. N. S. Wales, IX, p. 569.*Dorcopsis beccarii* MIKLOUHO-MACLAY, 1885, Proc. Linn. Soc. N. S. Wales, X, p. 146.

Fig. 12. Palatal views of skulls of (A) *Dorcopsis luctuosus*; (B) *Dorcopsis macleayi*. Natural size.

MATERIAL.—Central Division of Papua, Kubuna, 100 meters, 1 sub-ad. ♂, 1 ad. ♀.

The names *chalmersi* and *beccarii* have customarily been placed in the synonymy of *luctuosa*. Matschie,¹ however, comparing the descriptions of the two, has concluded that they may be separable. He considered *luctuosa* as coming from Epa, near Hall Sound; *beccarii* was obtained behind Port Moresby. However, even though *beccarii* were

¹ 1916, Sitz.-ber. Ges. Naturf. Freunde, Berlin, pp. 51–57.

distinct it would in all probability be synonymous with *chalmersi*, also from Port Moresby and described the year before.

MEASUREMENTS.—See p. 473. Skull (Fig. 12 A).

Dorcopsis (Dorcopsis) hageni Heller

Dorcopsis (Dorcopsis) hageni hageni Heller

Dorcopsis hageni HELLER, 1896, Abh. Zool. Mus. Dresden, VI, No. 8, p. 7.

MATERIAL.—Humboldt Bay (Hol), Northern New Guinea, 1 juv. ♂ (skin without skull) collected by Ernst Mayr.

Dorcopsis (Dorcopsulus) macleayi Miklouho-Maclay

Dorcopsis macleayi MIKLOUHO-MACLAY, 1885, Proc. Linn. Soc. N. S. Wales, X, p. 149.

Dorcopsulus macleayi MATSCHIE, 1916, Sitz.-ber. Ges. Naturf. Freunde, Berlin, p. 57.

MATERIAL.—Central Division of Papua, Mafulu, 1250 meters: 3 ad. ♂s, 2 ad. ♀s, 1 juv. ♀.

MEASUREMENTS.—See pp. 473-474. Skull (Fig. 12 B).

Dorcopsis (Dorcopsulus) rothschildi (Thomas)

Dorcopsulus rothschildi THOMAS, 1922, Ann. Mag. Nat. Hist., (9) IX, p. 672.

MATERIAL.—Mandated Territory of New Guinea, Huon Peninsula, Sevia, 1700 meters: 1 ad. ♂ (virtually a topotype); Central Division of Papua, Mt. Tafa, 2400 meters: 1 sub-ad. ♂, 2 juv. ♂s.

MEASUREMENTS.—See p. 474.

DENDROLAGUS SCHLEGEL AND MÜLLER

Dendrolagus SCHLEGEL AND MÜLLER, 1839-1844, 'Verh. Nat. Geschiednis Ned. overs. besittingen,' Zool., Leiden, p. 138.

Of this genus, which occurs through New Guinea and its adjoining islands and in North Queensland, there are only two species present in our collections, namely *D. matschiei* from the Huon Peninsula and *D. dorianus* from the Central Division of Papua. Some sixteen forms have been described, only two of which come from Australia. New Guinea may, therefore, be regarded as headquarters for this genus.

Dendrolagus matschiei Förster and Rothschild

Dendrolagus matschiei flavidior Matschie

Dendrolagus matschiei flavidior MATSCHIE, 1912, Sitz.-ber. Ges. Naturf. Freunde, Berlin, X, pp. 571-572.

MATERIAL.—From Huon Peninsula region, Mandated Territory of

New Guinea: 3 skins in poor condition, lacking skulls (collected by Whitney South Sea Expedition), A.M.79774, 100862-63, sexes not determinable.

These skins are referred to the above race with type locality Sattelberg, former German New Guinea, rather than to true *matschiei*, on account of the general agreement of their strong, clear colors with the former and their lack of the grayish color cast and grayish face described by Förster and Rothschild (and shown in their colored plate) for the latter. Otherwise our material would be identified as *m. matschiei* whose type locality was Rawlinson Mountains in the Huon region. Perhaps *flavidior* represents individual variants which may occur anywhere through the range of *matschiei*. One of our specimens has the yellow of the face extended upward almost to a line joining the front edges of the ears.

Dendrolagus dorianus Ramsay

Dendrolagus dorianus RAMSAY, 1883, Proc. Linn. Soc. N. S. Wales, VIII, p. 17.

MATERIAL.—Mafulu, Central Division, Papua, 1250 meters: 1 juv. ♂ (m³ not erupted), 1 ad. ♀.

The above specimens agree so closely with Ramsay's excellent detailed description of the type that their identity cannot be doubted.

Besides the usual measurements, crown dimensions of premolars and molars of our specimens are tabulated in the hope that as with *Macropus*, *Dorcopsis* and other genera they may be of diagnostic value for the species. In the absence of other species with which to make comparisons the point cannot be verified immediately. The close similarity of the crown dimensions (the male with slightly larger teeth) of the two animals is to be noted. Some discrepancy may be seen also between the crown lengths of p₃ of Ramsay's male type and our adult female, the tooth in our specimen being longer.

The above two individuals were brought to Mr. Archbold by a native, dead and slung upon the same pole. They may possibly be mother and son. They were reported taken high above Mafulu. Archbold gives the Kuni name as "*Ifola*."

MEASUREMENTS.—See p. 475.

TABLES OF MEASUREMENTS

(For explanatory footnotes to these tables, see p. 476.)

Phascogale, Subgenus *Antechinus*

	♀ A.M.101978 ad. <i>melanura mayeri</i> Weyland Mts.	♂ A.M.104051 y. ad. <i>melanura melanura</i> Matulu	♂ A.M.104052 y. ad. <i>melanura melanura</i> Matsika	<i>melanura</i> (type descr.) ♂ co-type Moroka	<i>melanura</i> (type descr.) ♀ co-type Moroka	<i>modesta</i> (type descr.) ad. ♂ Mt. Goliath	<i>mayeri</i> (type descr.) ♀ Arak Mts.
Skin:							
head and body	123	109	104	107	106	106	116
tail	155	134	116	120	128	126	143
hind foot (s.u.)	24	21	21	21	20	20	23
Skull:							
total length							33.5
condylo-basal length							
condylo-incisive length							
occipito-nasal length							
basal length	30.8				27.0		
zygomatic breadth	19.2		15.2		17.0		19.0
inter-orbital breadth	8.2	7.0	6.8				
mastoid breadth	14.2	12.2	12.1				
nasals, length					10.0		
nasals, greatest breadth					4.5		
palatilar length	16.5	14.9	13.3				
palatal length							16.0
ant. palatal foramina	3.0	2.9	2.9				
post. palatal foramina	3.0	2.9	2.9				
breadth meso.-pter. fossa							
length bulla	3.0	2.7	2.5				
length mandible							
Teeth:							
upper toothrow							16.0
crowns m ¹⁻⁴							
crowns p ⁴ -m ⁴							
crowns m ¹⁻³	6.4	6.0	6.2		6.1		
crown m ⁴							
milk p ³ , length × breadth							
milk p ⁴ , length × breadth							
perm. p ⁴ , length	1.4	1.3					
m ¹ , length × breadth	2.0×1.7	2.0×1.6	2.1×1.5				
m ² , length × breadth	2.0×2.2	2.0×1.9	2.0×1.9				
m ³ , length × breadth	1.9×2.4	1.8×2.2	1.9×2.2				

Phascogale, Subgenus *Murexia*

	<i>murex</i> (type) ad. ♂ Sattelberg Mts.	<i>maximus</i> (type) ad. ♂ Geelvink Bay	<i>aspera</i> (type) ad. ♀ Utakwa R., 600 m.	A.M.101971 ad. ♂ <i>murex aspera</i> Weyland Mts.	A.M.101973 y. ad. ♂ <i>murex aspera</i> Weyland Mts.	A.M.101970 juv. ♂ <i>murex aspera</i> Weyland Mts.	A.M.101972 y. ad. ♀ <i>murex aspera</i> Weyland Mts.
Skin:							
head and body	197 ¹	235	169	212	175	80	155
tail	167 ¹	215	180	240	200	81	159
hind foot (s.u.)	35	40	33	41	37	20	30
Skull:							
total length							
condylo-basal length		56.9	43				
basal length				49	41	24.5 ±	35.0
zygomatic breadth	24.0	30.9	22.7	27.9	23.3		20.9
inter-orbital breadth	7.5	7.0	8.7	12.6	9.5		9.0
interparietals							
breadth braincase							
mastoid breadth			16.5	18.7	16.9		14.9
nasals, length			16				
nasals, greatest breadth			5.3				
palatilar length				28.3	24.0		20.2
palatal length	26.0		24.4				
ant. palatal foramina				5.3	4.0		3.7
post. palatal foramina				5.0	3.0 (5.0)		5.5
breadth meso.-pter. fossa							
width inside m ¹ - m ¹							
length bulla				3.9	3.6	2.9	3.4
Teeth:							
upper tooththrow							
maxillary tooththrow							
crowns m ¹⁻⁴							
crowns p ^{4-m4}							
crowns m ¹⁻³	7.9	2	8.9	8.9	9.1		7.9
milk p ³ , length							
milk p ⁴ , length						1.2	
perm. p ⁴ , length				2.4	2.5		1.8
m ¹ , length × breadth				3.1×2.2	3.4×1.8	3.4×2.2	3.0×2.0
m ² , length × breadth				2.9×2.8	3.0×2.9		2.7×2.6
m ³ , length × breadth				2.8×3.1	2.7×3.3		2.4×2.9

Phascogale, Subgenus *Neophascogale*

	A.M.103276 ad. ♂ <i>venusta</i> Weyland Mts.	A.M.101979 juv. ♂ <i>venusta</i> Weyland Mts.	A.M.101980 y. ad. ♀ <i>venusta</i> Weyland Mts.	<i>lorenzii</i> (type descr.) y. ad. ♀ Hellwig Mts.	<i>L. venusta</i> (type descr.) ad. ♂ Weyland Mts.	" <i>lorentzii</i> " ♂ (Thomas' note, 1912)
Skin:						
head and body	198	135	166	220	187	
tail	179	156	174	200	188	
hind foot (s.u.)	39	33	36		39	
hind foot (c.u.)				38		
ear					23	
Skull:						
total length						
condylo-basal length					46.5	53
basal length			39.4	44		
zygomatic breadth	25.7		20.8	24	36 ³	
inter-orbital breadth	10.0		10.2		9.5	
nasals, length					19.4	
nasals, greatest breadth					6.0	
palatilar length	24.8		23.7			
palatal length				26	25.5	
ant. palatal foramina	3.8	3.8	4.1			
post. palatal foramina	2.5					
breadth meso.-pter. fossa						
length bulla	4.0	3.9	4.2			
Teeth:						
upper toothrow						
maxillary toothrow					18.0	
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴						
crowns m ¹⁻³	7.9	7.9	7.9	7.0	7.9	8.5
crowns m ¹⁻²						
crown i ³						
milk p ³ , length						
milk p ⁴ , length		0.9				
perm. p ⁴ , length	1.4		1.4			
m ¹ , length × breadth	2.7×1.8	2.9×1.7	2.9×1.8			
m ² , length × breadth	2.6×2.2	2.7×2.3	2.6×2.3			
m ³ , length × breadth	2.4×2.6	2.4×2.6	2.5×2.6			

Phascogale, Subgenus *Myoictes*

	<i>wallachii</i> ♂ (Thomas, 1888) Katau (alc.)	<i>pilicauda</i> (type) ♀ Fly River (alc.)	<i>thorbeckiana</i> ♂ (Thomas, 1888) Salawattre Isl.	<i>nouhuysii</i> y. ad. ♀ S. Dutch New Guinea	A.M.103267 ad. ♂ <i>melas sener</i> Weyland Mts.	A.M.101976 ad. ♀ <i>melas sener</i> Weyland Mts.	A.M.101977 y. ad. ♀ <i>melas sener</i> Weyland Mts.
Skin:							
head and body	185	175		195	189	178	169
tail	168	144		170	159	151	153
hind foot (s.u.)	39	34		33	35	36	36
Skull:							
total length							
condylo-basal length							
occipito-nasal length							
basal length	45		49.5	42.5	43.0	43.4	
zygomatic breadth	26.6		30	24.5	26	25.4	
inter-orbital breadth	11.0		10		10.3	10.5	
mastoid breadth					18.0		
nasals, length							
palatilar length					24.8	24.9	
palatal length	25.6		29.0	25.5			
ant. palatal foramina	3.7		3.7		3.7	3.9	3.4
post. palatal foramina						4.0	
length bulla					4.6	4.4	
Teeth:							
crowns m ¹⁻⁴							
crowns p ⁴ -m ⁴							
crowns m ¹⁻³	9.2		10.0	8.0	9.6	9.4	9.5
crown m ⁴							
i ⁴ -m ⁴							
alveoli m ¹⁻³							
crowns m ¹⁻²							
crown i ³							
milk p ³ , length × breadth							
milk p ⁴ , length × breadth							
perm. p ⁴ , length	2.0		1.8		1.5	1.5	
m ¹ , length × breadth					3.4×2.3	3.2×2.2	3.1×2.1
m ² , length × breadth					3.3×3.1	3.1×2.9	3.3×2.8
m ³ , length × breadth					3.0×3.6	2.9×3.1	2.9×3.1
m ⁴ , length × breadth	— × 3		— × 3.6				

Phascogale, Subgenus *Phascolosorex*

	<i>dorsalis</i> ♀ (co-type a) Thomas, 1888 Arafak	<i>dorsalis</i> ♂ (b) Thomas, 1888	<i>doriae</i> ♀ co-type Thomas, 1888 Arafak. Genoa Mu- seum	<i>umbrosa</i> ad. ♂ (type descrip.) Arafak Mts., 1000 meters	<i>brevicaudata</i> ♂ (type descrip.) Weyland Range	<i>pan.</i> ♂ (type descrip.) Weyland Mts., 2000 meters	A.M. 103266 <i>doriae pan</i> ad. ♂ Weyland Mts.
Skin:							
head and body	134	167	152	154	150	226	190
tail	147	149	152	160	110	191	185
hind foot (s.u.)	27	26	32.5	33	24	41	30
Skull:							
total length				44	38.5		
condylo-basal length						55.8	
basal length	32.7		38.5				48.4
zygomatic breadth	18.0		21	21	20.5	30.0	27.0
inter-orbital breadth	8.0		9.5			8.4	11.0
mastoid breadth							19.0
nasals, length					16	23	
nasals, greatest breadth							
palatilar length							27.5
palatal length	20		24.5	23			
ant. palatal foramina	3		3.5				4.9
post. palatal foramina							4.6
length bulla							4.0
length mandible						44.2	
Teeth:							
upper toothrow				23	20		
crowns m ¹⁻⁴						12.6	
crowns m ¹⁻³	7		9				9.1
crown m ⁴							
i ¹ -m ⁴							
crowns m ¹⁻²							
crown i ³							
milk p ³ , length × breadth							
milk p ⁴ , length × breadth							
perm. p ⁴ , length	1.4		1.7				1.4
m ¹ , length × breadth							3.0×2.1
m ² , length × breadth							3.1×2.7
m ³ , length × breadth							2.8×2.9
m ⁴ , length × breadth	—×2.6		— ×3.0				—×3.4

Phascogale, Subgenus *Phascolosorex* (Continued)

	A.M.101975 y. ad. ♂ <i>doriae pan</i> Weyland Mts.	A.M.101974 ad. ♀ <i>doriae pan</i> Weyland Mts.	A.M.104046 ad. ♂ <i>dorsalis whartoni</i> Mt. Tafa	A.M.104047 ad. ♂ <i>dorsalis whartoni</i> Murray Pass	A.M.104048 ad. ♀ <i>dorsalis whartoni</i> Mt. Tafa	A.M.104049 ♀ ? <i>dorsalis whartoni</i> Mt. Tafa
Skin:						
head and body	160	158	173	130	130	117
tail	154		131	127	116	120
hind foot (s.u.)	33	31	25	25	22	23
Skull:						
total length						
condylo-basal length						
occipito-nasal length						
basal length	40.0	38. ±	36.7		31.2	
zygomatic breadth	21.5	19.9	21.0		17.6	16.3
inter-orbital breadth	9.5	8.7	8.7		7.7	7.9
mastoid breadth	17.2	16.1	15.0		13.2	13.2
nasals, length			15.2			
nasals, greatest breadth			5.7			
palatilar length	24.1	22.0	20.2		18.9	
palatal length			20.9			
ant. palatal foramina	3.9	3.6	4.3		3.4	
post. palatal foramina	4.4	4.4	4.3		5.3	3.0
length bulla	3.7	3.6	3.5		3.0	3.3
Teeth:						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴						
crowns m ¹⁻³	8.6	8.2	7.3		6.5	6.4
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ² , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length	1.3	1.3	1.1		1.1	1.0
m ¹ , length × breadth	2.9×2.0	2.8×1.8	2.5×1.6	2.4×1.6	2.2×1.7	2.3×1.4
m ² , length × breadth	3.0×2.6	2.8×2.4	2.4×2.0		2.3×1.9	2.2×1.8
m ³ , length × breadth	2.6×2.8	2.6×2.5	2.3×2.3	2.2×2.4	2.1×2.3	2.0×2.2
m ⁴ , length × breadth			— ×2.4		— ×2.0	

Phascogale

	A.M.104005 ad. ♀ <i>rona</i> (type) Rona, Centr. Div.	<i>naso</i> old ♂ (type descrip.) Hellwig Mts.	<i>longicaudata</i> ♀ Aru Isl.	<i>longicaudata</i> ♂ (type) (Thomas, 1888) Aru Isl.	A.M.104050 ♀ <i>tafa</i> (type) Mt. Tafa
Skin:					
head and body	128	145	146 ⁴		134
tail	98	145	172 ⁴		145
hind foot (s.u.)	21	27	24		25
Skull:					
total length					
condylo-basal length					
condylo-incisive length					
occipito-nasal length					
basal length	25.3	32			29.7
zygomatic breadth	16.3	19.5		21.0	17.3
inter-orbital breadth	5.4			7.1	7.7
interparietals					
breadth braincase					
mastoid breadth	11.6				13.1
nasals, length					
nasals, greatest breadth					
palatilar length	13.0				17.0
palatal length	13.7	19.0		21.5	17.1
ant. palatal foramina	2.6			4.0	3.2
post. palatal foramina	2.8				3.7
breadth meso.-pter. fossa					
width inside m ¹ -m ¹					
length bulla	2.9				3.1
length mandible					
Teeth:					
crowns m ¹ - ⁴					
crowns p ⁴ -m ⁴					
crowns m ¹ - ³	5.1	5.5		7.4	6.4
crown i ³					
perm. p ⁴ , length				1.8	1.5
m ¹ , length × breadth	1.8 × 1.5				2.3 × 1.8
m ² , length × breadth	1.8 × 1.8				2.3 × 2.2
m ³ , length × breadth	1.6 × 2.1				2.2 × 2.4
m ⁴ , length × breadth				— × 2.7	— × 2.4

Dasyurus

	A.M.104044 ad. ♂ <i>albopunctatus</i> Mt. Taifa	A.M.104045 ad. ♂ <i>albopunctatus</i> Mt. Taifa	A.M.103473 ad. ♂ <i>a. daemoneilus</i> Ifaar, n. coast N. Guinea	<i>daemoneilus</i> ♂ (type descrip.) Aroa River	<i>fuscus</i> (type descrip.) Arfak Mts.	<i>albopunctatus</i> ♀ (type) Meyer, 1899 Sapola, Arfak Mts.	<i>Dasyurus</i> sp. Sattelberg (Meyer, 1899)
Skin:							
head and body	305	290	330	350	230	270	360
tail	265	265	237	285	190	230	300
hind foot (s.u.)	49	50	56	53		42	50
hind foot (c.u.)			59				
Skull:							
total length							
condylo-basal length							
condylo-incisive length							
occipito-nasal length							
basal length	59.5			65.6			
zygomatic breadth	41.6			42		35.4	
inter-orbital breadth	15.7			15.8			
interparietals							
breadth braincase							
mastoid breadth							
nasals, length	24			25		17	
nasals, greatest breadth	9.9			10.5		9	
palatal length	32.5			36.5		28	
ant. palatal foramina	3.9			4.2		2.8	
Teeth:							
upper tooththrow							
maxillary tooththrow							
crowns m ¹⁻⁴							
crowns p ⁴ -m ⁴							
crowns m ¹⁻³	12.9			13.6		11.5	
crown m ⁴							
i ¹ -m ⁴							
alveoli m ¹⁻³							
crowns m ¹⁻²	9.8						
m ¹ , length × breadth	4.3 × 3.0						
m ² , length × breadth	4.4 × 4.1						
m ³ , length × breadth	4.4 × 4.6						
m ⁴ , length × breadth	— × 4.7			— × 5.6		— × 4.6	

Peroryctes

	<i>broadbenti</i> old ad. (type descrip.) Goldie River	<i>dorsalis</i> ♀ (type descrip.) Mamberano, 1410 m.	<i>longicauda</i> ♀ (type descrip.) Arafak	<i>longicauda</i> ♀ type also (Thomas, 1888) Arafak Mts.	<i>ornata</i> ad. ♂ (type descrip.) Aroa River	<i>rathschildi</i> (type descrip.) Huon region, 3600 m.	<i>mainois</i> (type descrip.) Huon region, 2000 m.	<i>mainois</i> (type descrip.) second specimen
Skin:								
head and body	508	270	260	272	300	300	370	340
tail	201	185	185	197	177	140	110	150
hind foot (s.u.)	99	54		54	59	62	71	
metatarsal	64 ^b		60					
Skull:								
total length	114	63						
condylo-basal length		61						
condylo-incisive length								
occipito-nasal length								
basal length				56.5	57.2			
zygomatic breadth	43	22.5		23.0	23.3			
inter-orbital breadth								
interparietals								
breadth braincase								
mastoid breadth								
nasals, length	51	25		25	27			
palatal length				36.3	37.0			
ant. palatal foramina				5.6				
post. palatal foramina								
breadth meso.-pter. fossa								
width inside m ¹ -m ¹								
length bulla								
length mandible								
Teeth:								
upper tooththrow								
maxillary tooththrow				6				
crowns m ¹ - ⁴								
crowns p ⁴ -m ⁴								
crowns m ¹ - ³	12.5 ^b	10.0		9.5	10.0			
crown m ⁴								
i ¹ -m ⁴		35.0						
alveoli m ¹ - ³								
crowns m ¹ - ²								

Peroryctes, Subgenus *Ornoryctes*

	A.M.104062 ad. ♂ <i>ornata ornata</i> Mt. Albert Edward	A.M.104060 ad. ♂ <i>ornata ornata</i> Mt. Albert Edward	A.M.104063 y. ad. ♂ <i>ornata ornata</i> Mt. Tafa	A.M.104059 ad. ♀ <i>ornata ornata</i> Mt. Albert Edward	A.M.104061 juv. ♀ <i>ornata ornata</i> Mt. Albert Edward	A.M.101981 y. ad. ♂ <i>ornata dorsalis</i> Weyland Mts.
Skin:						
head and body	303	294	284	297	239	256
tail	173	162	218	185	161	189
hind foot (s.u.)	54	57	62	59	51	55
metatarsal	36.5	38.0	40.2	38.0	33.5	35.9
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	61.0	60.0	56.7	60.0		53.2
zygomatic breadth	23.9	23.4		24.0		22.0
nasals, length	27.0	25.0		26.7		22.2
nasals, greatest breadth	3.0	2.5		2.9		2.0
palatal length	39.5	38.5	37.5	38.8		34.6
ant. palatal foramina	6.1	5.6		6.0		4.8
post. palatal foramina	7.8	7.5		7.0		7.7
length bulla	3.5	3.4		3.5		2.7
length mandible						
Teeth:						
maxillary toothrow	7	8		9		10
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	14.4	14.3	13.7	14.7		13.3
crowns m ¹⁻³	9.9	10.6	10.5	10.9		9.9
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²	6.8	7.2	7.0	7.5	6.9	6.6
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
m ¹ , length × breadth	3.3×1.9	3.5×2.0	3.4×2.0	3.7×2.1	3.4×2.0	3.4×2.0
m ² , length × breadth	3.4×2.5	3.5×2.6	3.6×2.5	3.9×2.6	3.5×2.3	3.2×2.3
m ³ , length × breadth	3.2×3.0	3.4×3.0	3.5×2.9	3.4×2.8		3.3×2.5

Peroryctes, Subgenus *Peroryctes*

	<i>raffrayana</i> ad. ♂ (type descrip.) Amberbaki	<i>raffrayana</i> ad. ♀ (type descrip.) Amberbaki	A.M.103254 juv. ♂ <i>raffrayana</i> Weyland Mts.	A.M.104066 ad. ♂ <i>raffrayana</i> Mafulu	A.M.104064 ad. ♂ <i>raffrayana</i> Murray Pass	A.M.104065 juv. ♂ <i>raffrayana</i> Murray Pass	<i>raffrayana</i> Specimen b. Thomas, 1888 Goldie River
Skin:							
head and body	330	340	297	342	354	258	410 ¹¹
tail	160	160	133	182	168	143	185 ¹¹
hind foot (s.u.)	80	80	65.0	79	74	63	82 ¹¹
metatarsal			41.5	54.3	51	49.4	
ear							25
Skull:							
condylo-basal length							
condylo-incisive length							
occipito-nasal length							
basal length			62.4	75.8			77 ±
zygomatic breadth			26.4	32.4	29.0		32 ±
inter-orbital breadth							
interparietals							
breadth braincase							
mastoid breadth							
nasals, length			29.0	34.3	35.0	25.4	38
nasals, greatest breadth			2.7	2.9	2.7		2.6
palatilar length							
palatal length			40.3	49.3	48.7		51.3
ant. palatal foramina			7.8	7.4	9.4		8.8
post. palatal foramina			7.9				
width inside m ¹ -m ¹							
length bulla			4.0	4.0			
Teeth:							
upper toothrow				12	13		14
crowns m ¹⁻⁴							
crowns p ⁴ -m ⁴				17.0	15.9		
crowns m ¹⁻³			12.9	12.3	11.8	12.4	12.6
crowns m ¹⁻²			8.7	8.4	8.0	8.5	
m ¹ , length × breadth			4.5×2.7	4.5×2.7	4.2×2.5	4.5×2.6	
m ² , length × breadth			4.1×3.3	4.1×3.2	3.8×3.1	4.0×3.0	
m ³ , length × breadth			4.2×3.4	4.1×3.3	3.9×3.3	4.0×3.1	

Microperoryctes

Echymipera

	A. M. 103262 y. ad. ♂? <i>murina</i> Weyland Mts.	<i>murina</i> ad. ♂ (type descrip.) Weyland Mts.	<i>doreyana</i> ♂ (type descrip.) Dorey, Dutch Guinea.	<i>rufescens</i> ♂ (type descrip.) (large co-type) Kel. Isl.	<i>aruenensis</i> juv. ♀ (type descrip.) Aru Isl.	<i>clara</i> (type descrip.) Japan Isl.
Skin:						
head and body	152	174	378	440	200	370
tail	105	111	79	110	60	106
hind foot (s.u.)	29	30			38	61
hind foot (c.u.)	31			75		
ear			25 × 18	29 × 19		35 × —
Skull:						
total length						
condylo-basal length	40.5	44.1				84.8
condylo-incisive length						
occipito-nasal length						
basal length	37.1					
zygomatic breadth	15.2	16.2				41.2
inter-orbital breadth	9.9	10.7				
interparietals						
nasals, length	17.0					38.1
nasals, greatest breadth						
palatilar length	24.6					
palatal length						
ant. palatal foramina	8.0 ±					
length mandible	29.9	33.4				66.2
Teeth:						
upper tooththrow						
maxillary tooththrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	9.5					13.7
crowns m ¹⁻³	6.8 ¹⁵	15				12.6
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²	4.6					
m ¹ , length × breadth	2.2 × 1.3					
m ² , length × breadth	2.2 × 1.7					
m ³ , length × breadth	2.2 × 1.9					

Echymipera (Continued)

	<i>garrauntua</i> y. ad. ♂ (type descrip.) R. M. 11.11.11.97 Mimita River	<i>garrauntua</i> ad. ♂ (type descrip.) MacLay Coast	<i>rufiventris</i> ad. ♀ (type descrip.) Bongu, Astrolabe Gulf	<i>myoides</i> ad. ♀ (type descrip.) New Britain	<i>cockerelli</i> (type descrip.) New Ireland	? Duke of York Isl.	A. M. 104070 y. ad. ♀ <i>doreyana</i> Mafulu, Central Div. Papua
Skin:							
head and body	410	432		209	254	300	
tail		82		52.9	63.5		
hind foot (s.u.)	74		49	44.0	44.0	52	51
ear	31 × —	22.0 × 14	15 × 14	22.8 × 18	18 × —	17 × —	
Skull:							
total length			66				
condylo-basal length	83						
condylo-incisive length							
occipito-nasal length							
basal length			61				
zygomatic breadth	30.5		27			27.6	
inter-orbital breadth							
nasals, length	36.5		28.5			28	26
nasals, greatest breadth						5.4	2.8
palatal length	51.5					38.8	39
ant. palatal foramina							5.7
post. palatal foramina							7.5
length bulla							3.8
length mandible							
Teeth:							
upper tooththrow						16	17
maxillary tooththrow							
crowns m ¹⁻⁴							
crowns p ⁴ -m ⁴							15.9
crowns m ¹⁻³	12.8		10.0		10.8		10.5
crown m ⁴							
i ¹ -m ⁴							
alveoli m ¹⁻³							
crowns m ¹⁻²							7.0
perm. p ⁴ , length						3.9	
m ¹ , length × breadth							3.6 × 2.8
m ² , length × breadth							3.4 × 3.0
m ³ , length × breadth							3.7 × 3.4

Echymipera (Continued)

	A.M.104069 ad. ♀ <i>doreyana</i> Marulu, Central Div.	A.M.101982 ad. ♂ <i>doreyana</i> Weyland Mts.	A.M.103259 ad. ♂ <i>doreyana</i> Japan Isl.	A.M.104573 y. ad. ♂ <i>orioño</i> Oriono River	A.M.104572 ad. ♂ <i>orioño</i> Oriono River	A.M.104493 y. ad. ♀ <i>orioño</i> Oriono River
Skin:						
head and body	328	290	334	244	273	198
tail	79	72	87	67	72	54
hind foot (s.u.)	54	52	58	48	50.5	39
ear				27×—	29×—	28×—
Skull:						
total length						
condylo-basal length						
occipito-nasal length				56.4		
basal length	63.5	59.2	64.0			
zygomatic breadth	27.7	27	28.6	23.9	25.7	22.2
nasals, length	28	29.2	29.0	24.3	26.9	20.7
nasals, greatest breadth	2.6	2.5	2.8	2.4	2.6	2.5
palatilar length						
palatal length	43.2	39.5	43.4	35.2	39.5	29.4
ant. palatal foramina	6.4	5.4		5.0	5.5	4.2
post. palatal foramina	8.5	8.4	8.2	6.0	7.2	5.8
breadth meso.-pter. fossa						
width inside m ¹ -m ¹						
length bulla	4.2	4.2	4.2	4.3	4.7	4.1
length mandible						
Teeth:						
upper toothrow	18	19	20	21	22	
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	16.7	15.5	16.5	15.1	15.2	
crowns m ¹⁻³	11.0	10.5	11.1	10.5	10.4	9.9
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²	7.2	7.0	7.2	6.9	6.7	6.3
m ¹ , length × breadth	3.5×2.9	3.5×2.8	3.7×2.8	3.6×2.2	3.5×2.3	3.2×2.1
m ² , length × breadth	3.5×3.2	3.4×3.0	3.6×3.2	3.5×2.7	3.5×2.7	3.0×2.6
m ³ , length × breadth	3.9×3.5	3.8×3.3	3.9×3.4	3.6×3.0	3.6×3.1	3.5×3.1

	<i>Suillomeles</i>		<i>Isodon</i>			
	M.C.Z. 7006 juv. (type descrip.) <i>hispidula</i> Dorey, Dutch New Guinea	Same with new measurements taken from type	<i>macroura</i> ad. ♂ (type descrip.) Port Essington, N. Australia	<i>macroura</i> ad. ♂ (Thomas' meas- urements of type, b, 1888)	<i>torosus</i> (type descrip.) Cooktown, Cape York Pen.	<i>moresbyensis</i> (type descrip.) Port Moresby
Skin:						
head and body	162		412.7	410	386	292
tail	33		184.1	180 ±	160	127
hind foot (s.u.)		30		70		
hind foot (c.u.)	33		78.3		78.7	63.5
Skull:						
total length	48 ±					
basal length	45.5			81		
zygomatic breadth	19			39.5		
inter-orbital breadth	10.8					
mastoid breadth	14.5			36		
nasals, length	14			5.8		
palatal length	22			53		
ant. palatal foramina	4					
post. palatal foramina				7.4		
width inside m ¹ -m ¹						
length bulla						
length mandible	29					
Teeth:						
upper toothrow				23		
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴						
crowns m ¹⁻³				13		
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²	7.4					
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth		0.6 × ?				
perm. p ⁴ , length				3.4		
m ¹ , length × breadth		3.7 × 2.2				
m ² , length × breadth		3.8 × 2.7				

Isodon (Continued)

	A.M.104087 juv. ♂ <i>moresbyensis</i> Baroka, Centr. Div.	A.M.104088 juv. ♂ <i>moresbyensis</i> Baroka, Centr. Div.	A.M.104486 old ad. ♂ <i>moresbyensis</i> Oriomo River	A.M.104490 old ad. ♂ <i>moresbyensis</i> Oriomo River	A.M.104487 ad. ♂ <i>moresbyensis</i> Oriomo River	A.M.104491 y. ad. ♂ <i>moresbyensis</i> Oriomo River
Skin:						
head and body	231	211	378	447	351	317
tail	102	97	144	173	154	138
hind foot (s.u.)	48	43	62	70	65	61
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length	52.5	47.7				
basal length			71.3		65.9	64.0
zygomatic breadth	23.2	22.1	34.5	38.5	32	30.4
nasals, length			33.5	32	31	28.4
nasals, greatest breadth			3.0	3.5	2.3	2.6
palatilar length						
palatal length			45.4	48.0	43.0	42.0
ant. palatal foramina			6.5	7.0	5.8	
post. palatal foramina			6.5	5.5	6.0	
Teeth:						
upper toothrow			25	26	27	28
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴			17.5	19.2	17.5	17.6
crowns m ¹⁻³			11.3	12.5	11.3	11.4
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³	10.5					
crowns m ¹⁻²	6.4	8.0	7.0	8.0	7.4	7.6
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth						
m ¹ , length × breadth ²⁴	3.3×2.8	4.0×3.1	3.4×3.5	4.0×3.5	3.8×3.3	3.8×3.3
m ² , length × breadth	3.2×3.0	4.0×3.4	3.6×3.9	4.0×4.0	3.6×3.9	3.6×3.6
m ³ , length × breadth	3.6×3.3		4.0×3.7	4.5×4.0	4.2×3.8	4.1×3.6

<i>Isodon</i> (Continued)				<i>Phalanger orientalis</i> Group		
	A.M.104488 y. ad. ♂ <i>moresbyensis</i> Oriomo River	A.M.104492 ad. ♀ <i>moresbyensis</i> Oriomo River	A.M.104489 ad. ♀ <i>moresbyensis</i> Oriomo River	<i>orientalis</i> ad. ♂ (Thomas, 1888) Wai albio, from Amboina (topotype)	A.M.80935 ad. <i>orientalis orientalis</i> Wetar series	A.M.80933 ad. <i>orientalis orientalis</i> Wetar series
Skin:						
head and body	350	337	345			
tail	131	133	133			
hind foot (s.u.)	66	58	63			
Skull:						
total length						
condylo-basal length						
basal length	67.8	65.4	68.0	87	86.3	87.2
zygomatic breadth	32.2	31.5	32.0	62	57	62.3
inter-orbital breadth				7.9	9.5	11.6
interparietals						
breadth braincase						
mastoid breadth					49	46.6
nasals, length	30.4	30.5	32.7	33	36	36.5
nasals, greatest breadth	3.2	2.8	3.0	12.5	15.5	14.5
palatilar length						
palatal length	44.3	43	44.5	48	48	48.5
ant. palatal foramina	6.0	6.3	6.3	6	7.0	7.5
post. palatal foramina	6.0	5.2	5.9			
Teeth:						
upper tooththrow	29	30	31			
maxillary tooththrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	18.9	18.7	19.3		25.7	26.1
crowns m ¹⁻³	13.0	12.2	13.0	14	15.9	16.0
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²	8.3	8.0	8.1			
crown i ³						
perm. p ⁴ , length				5.1	4.9	5.7
m ¹ , length × breadth	4.1×3.4	4.0×3.2	4.0×3.2		5.1×4.8	5.1×4.5
m ² , length × breadth	4.1×3.8	3.9×3.6	4.1×3.7			
m ³ , length × breadth	4.8×4.0	4.5×4.0	4.8×4.0			

Phalanger orientalis Group (Continued)

	A.M. 80936 ad. <i>orientalis orientalis</i> Wetar series	A.M. 80934 y. ad. <i>orientalis orientalis</i> Wetar series	A.M. 101998 ad. ♀ <i>interpositus</i> Weyland Mts.	A.M. 103264 ad. ♂ <i>interpositus</i> (paratype) Weyland Mts.	<i>ornatus</i> ad. ♂ (Thomas, 1888) Bagan	<i>breviceps</i> type (Thomas, 1888) San Cristobal, Solomons Is.	<i>breviceps</i> ad. ♀ (Thomas, 1888) Alu, Shortland, Solomons Is.
Skin:							
head and body						480	
tail						330	
hind foot (s.u.)						50 ±	
Skull:							
total length							
condylo-basal length							
condylo-incisive length							
basal length	80.5	73.5	74	71.2	72.5		67
zygomatic breadth	52.8	48.8	49.7	46.0	49	46	43.6
inter-orbital breadth					11	9	9.5
interparietals							
breadth braincase							
mastoid breadth	46.5	40.5	42.5	41.0			
nasals, length	33	31	29.5	27.0	30	30	27
nasals, greatest breadth	12.5	13.3	11.8	11.3	10	11.5	10.5
palatilar length							
palatal length			44	41	42	39.5	38.5
ant. palatal foramina			5	6.0	5.3	6.5	6.5
Teeth:							
upper toothrow							
maxillary toothrow							
crowns m ¹⁻⁴							
crowns p ⁴ -m ⁴	25.8	24	25.4	24.9			
crowns m ¹⁻³	15.7	14.9	16.5	16.6	13	14	14
crown m ⁴							
i ¹ -m ⁴							
alveoli m ¹⁻³							
crowns m ¹⁻²							
crown i ³							
milk p ³ , length × breadth							
milk p ⁴ , length × breadth							
perm. p ⁴ , length	5.3	5.2	5.2	5.2	4.8	4	4
m ¹ , length × breadth	4.9×4.5	4.9×4.0	5.4×4.3	5.7×4.5			

Phalanger orientalis Group (Continued)

	A.M. 99968 ad. ♂ <i>breviceps breviceps</i> Malaita	A.M. 99969 ad. ♂ <i>breviceps breviceps</i> Malaita	A.M. 99971 y. ad. ♂ <i>breviceps breviceps</i> Malaita	A.M. 99970 y. ad. ♂ <i>breviceps breviceps</i> Malaita	A.M. 79799 y. ad. ♂ <i>breviceps breviceps</i> Nissan Isl.	A.M. 79798 y. ad. ♀ <i>breviceps breviceps</i> Nissan Isl.	A.M. 79793 y. ad. ♀ <i>breviceps breviceps</i> Nissan Isl.	A.M. 99801 ad. ♂ <i>breviceps breviceps</i> Ruk Is.	A.M. 99805 ad. ♂ <i>breviceps breviceps</i> Long Is.
Skin:									
head and body	423	"310"							
tail	264	"375"							
hind foot (s.u.)	"51"	"54"							
Skull:									
basal length	67.2	66.2							
zygomatic breadth	44.1	44.3							
inter-orbital breadth	8.6	9.2							
interparietals									
breadth braincase									
mastoid breadth									
nasals, length	30	27							
nasals, greatest breadth	10.0	11.5							
palatilar length									
palatal length	38.4	38.7							
ant. palatal foramina	6.8	6.1							
post. palatal foramina									
width inside m ¹ -m ¹									
length bulla									
length mandible									
Teeth:									
upper toothrow									
maxillary toothrow									
crowns m ¹⁻⁴									
crowns p ⁴ -m ⁴									
crowns m ¹⁻³	14.1	14.3	14.0	14.3	13.8	13.4	12.5	14.7	14.9
crown m ⁴									
i ¹ -m ⁴									
alveoli m ¹⁻³									
crowns m ¹⁻²									
crown i ³									
milk p ³ , length × breadth									
milk p ⁴ , length			3.5						
perm. p ⁴ , length	3.5	3.6		3.7	3.5	3.6	3.4	4.3	3.7

Phalanger orientalis Group (Continued)

	A.M.99892 ad. ♂ <i>breviceps</i> Long Is.	A.M.99894 y. ad. ♂ <i>breviceps</i> Long Is.	A.M.99898 ad. ♀ <i>breviceps</i> Long Is.	A.M.99899 ad. ♀ <i>breviceps</i> Long Is.	A.M.99893 ad. ♀ <i>breviceps</i> Long Is.	A.M.79790 ad ♀ <i>breviceps</i> Bougainville	A.M. 79791 ad. ♀ <i>breviceps</i> Bougainville	A.M.79800 ad. ♀ <i>breviceps</i> Bougainville	A.M.79800-A ad. ♀ <i>breviceps</i> Bougainville
Skull:									
total length									
condylo-basal length									
condylo-incisive length									
occipito-nasal length									
basal length									
zygomatic breadth									
inter-orbital breadth									
interparietals									
breadth braincase									
mastoid breadth									
nasals, length									
nasals, greatest breadth									
palatilar length									
palatal length									
ant. palatal foramina									
post. palatal foramina									
breadth meso.-pter. fossa									
width inside m ¹ -m ¹									
length bulla									
Teeth:									
upper toothrow									
maxillary toothrow									
crowns m ¹⁻⁴									
crowns p ⁴ -m ⁴									
crowns m ¹⁻³	15.0	14.0	14.8	15.3	14.9	15.1	14.8	15.1	14.9
crown m ⁴									
i ¹ -m ⁴									
alveoli m ¹⁻³									
crowns m ¹⁻²									
crown i ³									
milk p ³ , length × breadth									
milk p ⁴ , length × breadth									
perm. p ⁴ , length	4.0	4.2	4.1	4.3	4.3	3.8	3.9		3.7

Phalanger orientalis Group (Continued)

	A.M.99852 o. ad. ♂ <i>ducatoris</i> Wide Bay	A.M.99874 o. ad. ♂ <i>ducatoris</i> Wide Bay	A.M.99854 ad. ♀ <i>ducatoris</i> Wide Bay	A.M.99875 ad. ♀ <i>ducatoris</i> Wide Bay	A.M.99853 y. ad. ♀ <i>ducatoris</i> Wide Bay	A.M.79785 ad. ♂ <i>coccynis</i> Huon	A.M.79786 ad. ♂ <i>coccynis</i> Huon	A.M.79789 juv. ♂ <i>coccynis</i> Huon	A.M.104093 o. ad. ♂ <i>sericeus</i> Murray Pass
Skull:									
total length									
condylo-basal length									
condylo-incisive length									
occipito-nasal length									
basal length	81	78.5	74	79.2	70	75.5	75.5		79 ±
zygomatic breadth	50	48	49.9	48.2	45.3	48.2	51		54
inter-orbital breadth									
interparietals									
breadth braincase									
mastoid breadth	37.8	38	39	39.5	36.5	38.5	40		
nasals, length	36	36	32	33		30.5	29		30
nasals, greatest breadth	12.7	12.5	12.6	11.7		11	13		10.4
palatilar length									
palatal length	45.8	45.5	42	45	40.6				
ant. palatal foramina									
post. palatal foramina									
breadth meso.-pter. fossa									
width inside m ¹ -m ¹									
length bulla									
Teeth:									
upper toothrow									
maxillary toothrow									
crowns m ¹⁻⁴									
crowns p ⁴ -m ⁴						26.4	26.0		24.3
crowns m ¹⁻³	14.9	14.7	14.7	14.0	15.0	17.6	17.3	17.2	17.2
crown m ⁴									
i ¹ -m ⁴									
alveoli m ¹⁻³									
crowns m ¹⁻²									
crown i ³									
milk p ³ , length × breadth									
milk p ⁴ , length								4.3	
perm. p ⁴ , length	4.5	4.5	3.7	4.0	4.1	4.7	4.5		4.2

Phalanger orientalis Group (Continued)

	A.M.104095 ad. ♂ <i>sericeus</i> Murray Pass	A.M.104094 ad. ♀ <i>sericeus</i> Murray Pass	A.M.104105 o. ad. ♀ <i>sericeus</i> Murray Pass	A.M.104110 ad. ♂ <i>carinidactylus</i> Mt. Tafa	A.M.104101 ad. ♀ <i>carinidactylus</i> Bellavista	A.M.104100 o. ad. ♂ <i>brevinasus</i> Matulu	A.M.104099 ad. ♂ <i>brevinasus</i> Matulu	A.M.104097 o. ad. ♂ <i>leucippus</i> Matulu
Skull:								
basal length	77.5	75.3	77.5	74.2	76.0	79	74	84.3
zygomatic breadth	53.5	49	50.5	52.6	50.5	56.2	48.2	62.5
inter-orbital breadth						9.7		
interparietals								
breadth braincase								
mastoid breadth	47.0	43.5	46.5	42.4	42.0	47.5	42.0	50
nasals, length	30.2	26.0	30.0	27.6	27.1	29	27	35.5
nasals, greatest breadth	12.0	9.5	11.0	12.2	11.1	14.3	13.5	13.0
palatilar length								
palatal length						4.6		
ant. palatal foramina						6.1		
post. palatal foramina						16.2		
breadth meso.-pter. fossa								
width inside m ¹ -m ¹								
length bulla								
length mandible								
Teeth:								
upper toothrow								
maxillary toothrow								
crowns m ¹ -4								
crowns p ⁴ -m ⁴	26.0	25.3	24.9	24.1	25.4	24.3	25.2	25.3
crowns m ¹ -3	17.0	16.7	16.3	16.3	16.8	15.8	15.9	15.4
crown m ⁴								
i ¹ -m ⁴								
alveoli m ¹ -3								
crowns m ¹ -2								
crown i ³								
milk p ³ , length × breadth								
milk p ⁴ , length × breadth								
perm. p ⁴ , length	4.5	4.5	4.7	4.4	4.7	5.1	5.2	6.0
m ¹ , length × breadth						5.3×4.4	5.2×4.3	
m ² , length × breadth								
m ³ , length × breadth								

Phalanger orientalis Group (Continued)

	A.M.104147 ad. ♂ (skull) <i>leucippus</i> Mafulu	A.M.104400 ad. ♀ <i>microdon</i> Dogwa	A.M.104401 ad. ♀ <i>microdon</i> Dogwa	A.M.104406 ad. ♀ <i>microdon</i> Dogwa	A.M.104105 juv. ♂ <i>microdon</i> Dogwa	A.M.104103 ad. ♀ <i>matsika</i> Matsika	A.M.104127 juv. ♀ <i>matsika</i> Matsika	A.M.104115 juv. ♀ <i>matsika</i> Matsika Diva Diva
Skull:								
total length								
condylo-basal length								
condylo-incisive length								
basal length	85.8	67.7	72.5	69.5		71.2	58	55.4
zygomatic breadth	59.9	46.2	47.9	45.9	36.4	44.5		
inter-orbital breadth								
interparietals								
breadth braincase								
mastoid breadth	51	38	42	40.2		39.3		
nasals, length	36.8	26.5	27.4	25.1		26.5		
nasals, greatest breadth	14.0	12.5	12.7	12.2		12.7		
palatilar length								
palatal length								
ant. palatal foramina								
post. palatal foramina								
width inside m^1 - m^1								
length bulla								
length mandible								
Teeth:								
upper tooththrow								
maxillary tooththrow								
crowns m^{1-4}								
crowns p^4 - m^4	24.5	21.2	21.0	21.0		24.3		
crowns m^{1-3}	14.7	13.6	13.2	13.4	13.4	15.8		
crown m^4								
i^1 - m^4								
alveoli m^{1-3}								
crowns m^{1-2}								
crown i^3								
milk p^3 , length × breadth								
milk p^4 , length					3.8		4.2	4.3
perm. p^4 , length	5.9	4.2	4.0	4.1		4.9		
m^1 , length × breadth		4.4×3.7			4.3×3.7	5.1×4.4	5.3×4.3	5.2×4.

Phalanger orientalis Group
(Continued)

Phalanger celebensis
Group

	A.M.104120 juv. ♂ <i>matsika</i> Bellavista	A.M.104121 juv. ♂ <i>matsika</i> Matulu	A.M.101241 ad. ♂ <i>celebensis</i> Tanko Salokko, 2000 m.	A.M.101242 y. ad. ♂ <i>celebensis</i> Tanko Salokko, 2000 m.	Buit. Mus. 2805 ad. ♂ <i>celebensis</i> Roeroekan, 900 m.	Buit. Mus. 2808 y. ad. ♂ <i>celebensis</i> Roeroekan, 1000 m.	Buit. Mus. 2810 y. ad. ♂ <i>celebensis</i> Roeroekan, 1000 m.
Skin:							
head and body			380	311	332	320	300
tail			352	237	373	320	310
hind foot (s.u.)			45	38		45	45
hind foot (c.u.)							
Skull:							
basal length	62	54 ±	60	57.8	58.9	59.4	56.6
zygomatic breadth			42.5	39.2	41.5	39.4	40.1
inter-orbital breadth			10.8	9.0	9.6	9.4	9.0
mastoid breadth							
nasals, length			25.2	24.5	23.2	23.1	21.6
nasals, greatest breadth			10.1	9.8	8.8	9.4	9.7
palatilar length			33.2		31.9	32.9	
palatal length							
ant. palatal foramina			5.4	5.7	5.2	5.5	4.3
post. palatal foramina							
breadth meso.-pter. fossa							
width inside m ¹ -m ¹							
length bulla							
length mandible							
Teeth:							
crowns p ⁴ -m ⁴			19.1	18.4	19.2	19.3	19.6
crowns m ¹⁻³							
crown m ⁴							
i ¹ -m ⁴							
alveoli m ¹⁻³							
crowns m ¹⁻²							
crown i ³							
milk p ³ , length × breadth							
milk p ⁴ , length	4.4	4.3					
perm. p ⁴ , length × breadth			3.8×3.4	3.8×3.6	3.9×3.6	3.8×3.7	4.2×3.7
m ¹ , length × breadth	5.5×4.4	5.3×4.3	4.3×3.6	4.1×3.3	4.6×3.6	4.5×3.6	4.6×3.5
m ² , length × breadth							
m ³ , length × breadth							

Phalanger celebensis Group
(Continued)

Phalanger
ursinus
Group

	Buit. Mus. 2806 ad. ♀ <i>celebensis</i> Roeroekan, 500 m.	Buit. Mus. 2809 ad. ♀ <i>celebensis</i> Roeroekan, 1000 m.	Buit. Mus. 2811 y. ad. ♀ <i>celebensis</i> Roeroekan, 1000 m.	<i>sangirensis</i> ? ad. ♂ (Thomas, 1888) Sanghir Isl.	<i>ursinus</i> ad. ♀ (Thomas, 1888) North Celebes	A.M.100981 old ad. ♀ <i>ursinus</i> S. Celebes, Lampo- batang
Skin:						
head and body		330	320	390	650	
tail		320	310		525	
hind foot (s.u.)		45	45	48	104	
hind foot (c.u.)						
Skull:						
basal length		58.3	54.5	55 ±	84	96.5
zygomatic breadth	39.3	42.0	38.0	38	61	68
interorbital breadth	9.7	11.6	8.0	9		
mastoid breadth						56.5
nasals, length	23.4	23.6	22.0	20	28	35
nasals, greatest breadth	10.6	10.1	8.4	8.8	17	19
palatilar length	32.7	32.3				
palatal length				33	48	51
ant. palatal foramina	6.4	5.1	4.8	4.2	7.2	9.5
post. palatal foramina						
breadth meso-pter. fossa						
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
crowns p ⁴ -m ⁴		19.0	19.4			33.5
crowns m ¹⁻³	12.2			13.3	21	22
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	4.2×3.6	4.0×3.4	3.7×3.6	4.3×—	6×—	6.4×—
m ¹ , length × breadth	4.3×3.6	4.6×3.5	4.4×3.8			7.6×5.7
m ² , length × breadth						
m ³ , length × breadth						

Phalanger maculatus Group

	<i>maculatus goldiei</i> ? ad. ♂ (Thomas, 1888) Port Moresby	A.M.104404 ad. ♂ <i>maculatus goldiei</i> Oriomo River	A.M.104389 ad. ♂ <i>maculatus goldiei</i> Oriomo River	A.M.104390 ad. ♂ <i>maculatus goldiei</i> Oriomo River	A.M.104392 ad. ♂ <i>maculatus goldiei</i> Oriomo River	A.M.104396 ad. ♀ <i>maculatus goldiei</i> Dogwa, Oriomo River
Skull:						
basal length	95	91.5		96.0	93.0	97.5
zygomatic breadth	61	66.0	66.5	69.0	67.5	66
inter-orbital breadth	16.8					
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	28	39		40	39.0	41
nasals, greatest breadth	17					
palatilar length						
palatal length	48	53				56.5
ant. palatal foramina	7.2					
post. palatal foramina		20.4				19.5
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
upper tooththrow						
maxillary tooththrow						
crowns m ¹ - ⁴						
crowns p ⁴ -m ⁴		30.7		31.7	30.5	29.5
crowns m ¹ - ³		19.5		19.6	19.8	19.0
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹ - ³	21					
crowns m ¹ - ²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	6×—	6.4×5.2		6.5×5.8	5.8×5.3	5.5×4.9
m ¹ , length × breadth		6.7×5.8		6.7×4.9	6.7×5.7	6.3×5.4
m ² , length × breadth						
m ³ , length × breadth						
m ⁴ , length × breadth		5.3×4.7	5.3×4.9	5.9×5.1	5.9×5.1	5.7×4.9

Phalanger maculatus Group (Continued)

	A.M.104395 ad. ♀ <i>maculatus goldiei</i> Dogwa, Oriomo R.	A.M.104399 ad. ♀ <i>maculatus goldiei</i> Dogwa, Oriomo R.	A.M.104017 ad. ♀ <i>maculatus goldiei</i> Rona	A.M.100881 y. ad. ♂ <i>maculatus maculatus</i> Arfak	A.M.79807 ad. ♂ Astrolabe Bay	A.M.99832 juv. ♂ <i>maculatus krämeri</i> Manus
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	96.5	98	99	92	108	73.5
zygomatic breadth	65.5	65.5	65.6	67	74.8	55
inter-orbital breadth						
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	43	41	39	38.5	49	
nasals, greatest breadth						
palatilar length						
palatal length	57	57			64.5	
ant. palatal foramina						
post. palatal foramina	20	20.5			21.5	
width inside m ¹ -m ¹						
Teeth:						
upper tooththrow						
maxillary tooththrow						
crowns m ¹ - ⁴						
crowns p ⁴ -m ⁴	31	34	32.2	33	34.8	29.5 ±
crowns m ¹ - ³	20	21	20.7	21.5	22.5	19.8
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹ - ³						
crowns m ¹ - ²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	5.9×5.2	7.2×6.4	6.4×5.6	6.0×5.4	6.5×5.8	6.2×5.5
m ¹ , length × breadth	6.3×5.5	7.2×5.9	7.0×5.7	7.3×5.5	7.3×6.0	6.7×5.3
m ⁴ , length × breadth	6.1×5.0	6.2×5.3	6.3×5.4	6.2×5.2	6.2×5.8	

Phalanger maculatus Group
(Continued)

Eudromicia

	A.M.99831 juv. ♂ <i>maculatus krämeri</i> Manus	A.M.99829 y. ad. ♀ <i>maculatus krämeri</i> Admiralty Is.	A.M.99900 y. ad. ♀ <i>maculatus krämeri</i> Admiralty Is.	A.M.99749 ad. ♀ (albino) <i>maculatus krämeri</i> Admiralty Is.	♀ <i>caudata</i> (type) ad. Arafak Mts.	♀ <i>caudata</i> (type) (Thomas' measure- ments) Arafak Mts.
Skin:						
head and body					120	100
tail					150	144
hind foot (s.u.)						16
Skull:						
basal length	76.5	79	80	80		24.4
zygomatic breadth	54.2	52.2	53	58		18.0
inter-orbital breadth						5.7
nasals, length				34		11.0
nasals, greatest breadth				12.5		4.2
palatilar length						
palatal length				49		14.6
ant. palatal foramina						
post. palatal foramina				18.5		
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴		30.6	29.5	30.5		
crowns m ¹⁻³	20.0	20.1	19.4	19.8		4.6
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	6.7×5.7	5.9×5.1	6.0×4.9	6.0×5.5		
m ¹ , length × breadth	6.7×5.4	6.5×5.3	6.8×5.4	7.2×5.4		
m ² , length × breadth						
m ³ , length × breadth						
m ⁴ , length × breadth		5.9×5.1	5.8×4.9	6.0×4.8		

<i>Eudromicia</i> (Continued)						<i>Petaurus</i>
	A.M.104053 ad. ♂ <i>caudata</i> Matsika, Papua	A.M.104054 ad. ♂ <i>caudata</i> Matsika, Papua	A.M.104055 ad. ♂ <i>caudata</i> Matsika, Papua	A.M.79756 ad. ♀ <i>caudata</i> Cromwell Mts., Mand. Terr.	<i>macrura</i> (type) ♀ Port Essington, N. Australia	A.M.104458 ad. ♂ <i>papuanus/candidus</i> Orlomo River
Skin:						
head and body	117	108	104		83	
tail	155	170	168		135	
hind foot (s. u.)	19.5	18.5	18.0	17.0		
Skull:						
occipito-nasal length	29.5	29.3	28.0			36.5
basal length	26.2	25.7	24.9	24.6	25.5	30.5
zygomatic breadth	18.0	17.9	17.3	16.3	20.0	25.2
inter-orbital breadth	5.5	5.6	5.4	5.4	6.0	8.0
interparietals						7.0
breadth braincase						16.3
mastoid breadth						
nasals, length					11.0	12.1
nasals, greatest breadth					4.3	6.0
palatal length	15.7	15.6	15.0	14.9		16.8
ant. palatal foramina	2.6	2.4	2.2	2.5	2.0	2.1
post. palatal foramina	4.0	3.9	3.8	4.2	4.0	
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	33	34	35	36		
crowns m ¹⁻³						5.4
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	1.8×—	1.7×—	1.6×—	1.3×—	1.7×— ³²	1.6×—
m ¹ , length × breadth	1.9×1.8	1.9×1.8	2.0×1.9	1.8×—		2.2×1.9
m ² , length × breadth	1.6×1.7	1.6×1.8	1.5×1.8	1.4×1.5		1.7×1.8
m ³ , length × breadth	1.2×1.4	1.1×1.3	1.2×1.4	1.1×1.3		

Petaurus (Continued)

	A.M.104465 ad. ♂ <i>papuanus / aridus</i> Oronoto R.	<i>papuanus</i> ad. ♂ Thomas' type (n) Huon Gulf	A.M.99868. ad ♂ <i>papuanus</i> New Britain	A.M.79806 ad. ♀ <i>papuanus</i> Goodenough Isl.	A.M.101967 ad. ♂ <i>papuanus papuanus</i> Weyland Mts.	A.M.101968 ad. ♀ <i>papuanus papuanus</i> Weyland Mts.
Skin:						
head and body		143				
tail		176				
hind foot (s.u.)		25				
ear		21				
Skull:						
occipito-nasal length	35.8		35.8	39.7	34.6	34.4
basal length	30.4	33.2			29.3	28.9
zygomatic breadth	25.8	25.5	24.1	25.3	24.1	23.9
inter-orbital breadth	7.7	8	7.3	7.9	7.2	6.7
interparietals	6.8		6.4	6.5	6.1	6.0
breadth braincase	16.2		16.5	17.5	16.6	15.7
mastoid breadth						
nasals, length	12.3	12	11.8	12.5	10.1	12.5
nasals, greatest breadth	6.2	6.4	5.4	6.8	6.3	6.1
palatilar length						
palatal length	17.0	19		18.6	16.7	16.5
ant. palatal foramina	2.1	2.5	2.4	2.9	1.7	2.0
Teeth:						
upper tooththrow						
maxillary tooththrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	7.8		7.8	8.2	7.4	8.1
crowns m ¹⁻³	5.3	5.4	5.0	5.4	5.0	5.3
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	1.5×—	1.9×—	1.5×—	1.8×—	1.5×—	1.7×—
m ¹ , length × breadth	2.1×2.0		2.0×1.8	2.2×2.1	2.2×1.9	2.2×1.9
m ² , length × breadth	1.8×1.9				1.7×1.8	1.8×1.8

Petaurus (Continued)

	A.M.104031 ad. ♂ <i>papuanus papuanus</i> Marulu	A.M.104029 ad. ♀ <i>papuanus papuanus</i> Marulu	A.M.104016 ad. ♂ <i>papuanus papuanus</i> Rona	A.M.104028 y. ad. ♂ <i>papuanus taia</i> Tafa	A.M.79770 y. ad. ♂ <i>papuanus taia</i> Sevia	A.M.79771 y. ad. ♂ <i>papuanus taia</i> Sevia
Skin:						
head and body				135		
tail				155		
hind foot (s.u.)						
ear						
Skull:						
occipito-nasal length	37.6	36.1	36.9		33.6	35.3
basal length	32.0	30.5	31		28.9	30.7
zygomatic breadth	26.3	24.4	24.7		21.5	22.6
inter-orbital breadth	8	7.7	7.4	6.5	5.9	6.5
interparietals	6.2	7.0	6.2		5.5	5.2
breadth braincase	16.7	16.8	16.6		16.7	15.8
mastoid breadth						
nasals, length	13	13.4	12.1	12.2	11	12
nasals, greatest breadth	6.5	6.1	5.7	5.2	5.3	5.0
palatilar length						
palatal length	18.3	17.4	18.3	15.5	16.4	
ant. palatal foramina	2.1	2.2	2.0	2.1	2.3	2.9
Teeth:						
upper tooththrow						
maxillary tooththrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴		8.0	8.2	7.0	7.4	7.2
crowns m ¹⁻³	5.3	5.3	5.5	4.9	5.0	4.7
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	1.5×—	1.6×—	1.7×—	1.4×—	1.5×—	1.4×—
m ¹ , length × breadth	2.3×2.1	2.3×2.0	2.1×2.0	1.9×1.7	2.0×1.8	1.9×1.7
m ² , length × breadth	1.8×1.9	1.7×1.9	1.8×1.9	1.6×1.7		

Distoechurus

	<i>pennatus</i> (co-type) ♀ Andal, N. W. Dutch New Guinea	<i>pennatus</i> (co-type) ♂ Andal, N. W. Dutch New Guinea	<i>amoenus</i> (type) ad. ♂ Rawlinson Mts., Huon Pen.	<i>dryas</i> (type) ad. ♂ Mt. Gayata, Papua	<i>neukaussi</i> (type) ad. ♀ Sattelberg, Huon Gulf	A.M.101983 ad. ♂ <i>pennatus pennatus</i> Gebroeders Mts.
Skin:						
head and body	100	106			108	92
tail	123	153			135	145
hind foot (s.u.)	18.3	19.0	21.0	19.0	18.0	19.5
Skull:						
occipito-nasal length			31.5	30.0	32.0	
basal length	24.5				28.3	
zygomatic breadth	18.0				19.0	
inter-orbital breadth	6.0				6.5	6.1
mastoid breadth						
nasals, length	8.9				13.0	
nasals, greatest breadth	3.8				4.5	
palatilar length						
palatal length	14.9				16.5	15.0
ant. palatal foramina	3.0				3.7	3.9
post. palatal foramina					7.0	5.3
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴						37
crowns m ¹⁻³			4.5	4.1	4.5	
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth						0.8×—
m ¹ , length × breadth						1.6×1.5
m ² , length × breadth						1.4×1.5
m ³ , length × breadth						1.0×1.2
m ⁴ , length × breadth						

	<i>Distoechurus</i> (Continued)			<i>Dactylopsila</i>		
	A.M.104057 ad. ♀ <i>pennatus dryas</i> Kubuna, Papua	A.M.104058 juv. ♂ <i>pennatus dryas</i> Kubuna, Papua	A.M.102156 juv. ♀ <i>pennatus neohausi</i> Sepik River	<i>albertisi</i> ad. ♀ (type descrip.) Arrak	<i>anguatrittis</i> (type descrip.) Sorong	<i>pinnata</i> old ♀ (type descrip.) Cape York
Skin:						
head and body	106	78		260	260	275
tail	147	99		325	350	320
hind foot (s.u.)	20.0	16.0	15.0			44
hind foot (c.u.)					49	
Skull:						
occipito-nasal length	29.7	23.3	22.0			39
basal length	26.4					
zygomatic breadth	17.8		13.0			42
inter-orbital breadth	6.0					
mastoid breadth						
nasals, length	11.0					
nasals, greatest breadth						
palatilar length						
palatal length	15.5	11.8	11.2			
ant. palatal foramina	3.5					
post. palatal foramina	5.7					
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	38					
crowns m ¹⁻³						9.6
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	0.8×—					
m ¹ , length × breadth	1.8×1.5					
m ² , length × breadth	1.4×1.4					
m ³ , length × breadth	1.0×1.0					

Dactylopsila (Continued)

	<i>melampus</i> old ♀ (type descrip.) Mambaré	<i>occidentalis</i> ♀ (type descrip.) Waigeu	<i>biedermanni</i> ♀ (type descrip.) Upper Aroa	<i>kataui</i> juv. ♀ (type descrip.) Katau	<i>arifakensis</i> ad. ♂ (type descrip.) Arafak	<i>hindenburgi</i> (type descrip.) Sattelburg	<i>megalaria</i> ♀ (type descrip.) Gebroeders, land Range	<i>megalaria</i> ♀ No. 79 (type descrip.) Gebroeders, Wey- land Range
Skin:								
head and body	285	250	240	160	320		200	215
tail	330	320	310	185	330		285	280
hind foot (s.u.)	45	50	45	26	45		45	43
Skull:								
total length								
condylo-basal length								
condylo-incisive length								
occipito-nasal length	40							
basal length	54	49.7	50.2		55.7	50		
zygomatic breadth	41	38	35.2		39.2	38		
inter-orbital breadth		7.7	7.7					
interparietals								
breadth braincase								
mastoid breadth								
nasals, length		20	19		22.2			
nasals, greatest breadth								
palatilar length								
palatal length		28.9	29.2 ±		33.2			
ant. palatal foramina								
post. palatal foramina								
breadth meso-pter. fossa								
width inside m ¹ -m ¹								
Teeth:								
upper toothrow								
maxillary toothrow								
crowns m ¹⁻⁴								
crowns p ⁴ -m ⁴								
crowns m ¹⁻³	8.9	8.6	8.7		9.0			
crown m ⁴								
i ¹ -m ⁴								
alveoli m ¹⁻³								
crowns m ¹⁻²								
crown i ³								

Dactylopsila (Continued)

	A.M.104041 o. ad. ♂ <i>trivirgata melampus</i> Central Div., Papua	A.M.104040 o. ad. ♀ <i>trivirgata melampus</i> Central Div., Papua	A.M.104071 ad. ♀ <i>trivirgata melampus</i> Central Div., Papua	A.M.79783 o. ad. ♀ <i>trivirgata melampus</i> Serua	A.M.101986 y. ad. ♀ <i>trivirgata trivirgata</i> Gebroeders Mts.	A.M.101987 ad. ♀ <i>trivirgata trivirgata</i> Gebroeders Mts.
Skin:						
head and body	254	250	250	254	218	250
tail	353	362	335	356	314	311
hind foot (s.u.)	45	45	45?	47	46	48
Skull:						
total length						
condylo-basal length					48.7	55.9
condylo-incisive length						
occipito-nasal length	58	59	58.9	58.2	54.4	58.4
basal length						
zygomatic breadth	40.5	40.2		40.3	35.4	41.1
inter-orbital breadth	8.3	7.8	7.9	8.0	7.5	7.8
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	21.5	22.1	21.5	21.5	20.8	22.0
nasals, greatest breadth						
palatilar length						
palatal length	29.5	30	29.5	30.5	26.8	30.0
ant. palatal foramina	2.4	3.4	2.9	2.3	2.7	3.0
post. palatal foramina						
breadth meso.-pter. fossa			7.3	8.0	7.0	8.7
width inside m ¹ -m ¹					7.4	8.5
length bulla						
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹ -4						
crowns p ⁴ -m ⁴	13.6	12.9	13.3	13.0	13.3	12.9
crowns m ¹ -3	9.4	8.7	8.8	9.5	9.2	9.0
perm. p ⁴ , length × breadth					2.3×2.3	2.2×2.3
m ¹ , length × breadth	3.4×3.1	3.3×3.1	3.5×3.3	3.5×3.2	3.5×3.3	3.6×3.3
m ² , length × breadth	3.0×3.0	2.8×2.7	2.8×2.9	2.9×2.9	2.9×3.0	3.0×2.8
m ³ , length × breadth		2.4×2.4	2.4×2.4	2.5×2.6	2.5×2.6	2.4×2.4
m ⁴ , length × breadth		2.0×2.0	2.0×2.0	1.9×1.6		2.0×2.0

Dactylopsila (Continued)

Dactylonax

	A. M. 104482 y. ad. ♂ <i>fringilla kakaui</i> Oronono River	A. M. 104484 ad. ♂ <i>fringilla kakaui</i> Oronono River	A. M. 104485 ad. ♀ <i>fringilla kakaui</i> Oronono River	A. M. 101989 ad. ♀ <i>megalaria</i> (co-type) No. 79	<i>palpator</i> ad. ♂ de- scription S. coast New Guinea	A. M. 79778 ad. ♂ <i>palpator ernstmayri</i> Sevia, Huon Pen.
Skin:						
head and body	259	245	213	215	270 ⁴¹	215
tail	299	260	302	280	200	190
hind foot (s.u.)	47	45	46	41		51
hind foot (c.u.)				43		
Skull:						
total length					60	
condylo-basal length						57.9
occipito-nasal length	59		57.2	58.5		57.8
basal length						54.1
zygomatic breadth	40	49	36.8	37.0	42	45.2
inter-orbital breadth	7.8	7.8	8.0	8.7		9.4
nasals, length	20.5	20.0	19.5	21.6		20.5
nasals, greatest breadth						6.1
palatilar length						
palatal length	31.5	29.6	29.3	30.9		29
ant. palatal foramina	2.9	2.9	2.6	3.2		3.2
breadth meso.-pter. fossa	6.7	7.4	7.4	8.1		7.6
width inside m ¹ -m ¹	7.1	7.1	7.8	7.1		6.6
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹ - ⁴						
crowns p ⁴ -m ⁴	13.7	13.2	13.7	14.1		13.3
crowns m ¹ - ³	9.3	9.0	9.3	9.2		9.1
crown m ⁴						
i ¹ -m ⁴					27	31.0
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	2.1×2.1	2.2×1.9		2.3×2.0		2.5×2.3
m ¹ , length × breadth	3.6×3.3	3.3×3.4	3.8×3.3	3.4×3.2		3.6×3.5
m ² , length × breadth	2.9×2.8	2.6×2.9	2.8×3.1	2.9×2.8		3.0×3.1
m ³ , length × breadth	2.6×2.5	2.5×2.5	2.6×2.7	2.7×2.5		2.5×2.4
m ⁴ , length × breadth				2.3×2.15		
crowns, m ¹ - ³						9.4

Dac-
tylonax
(Con-
tinued)

Pseudochirus, Subgenus
Pseudochirops

	A.M.103275 ad. ♀ <i>palpator</i> Weyland Mts.	<i>albertisi</i> (type descrip.) Arfak Range	<i>albertisi</i> of Thomas (a) Moeri, 1000 m.	<i>coronatus</i> young (type descrip.) 2000 m.	<i>paradozus</i> ad. ♂ (type) Arfak, 2000 m.	A.M.100880 y. ad. ♂ <i>albertisi</i> Siwi, Arfak, 700 m.
Skin:						
head and body		340		250	340	
tail		310		220	327	
hind foot (s.u.)		50			46	44?
Skull:						
condylo-basal length	51.0					61.8
condylo-incisive length						61.0
occipito-nasal length	53.4				65	60.2
basal length	47.7		60	48.5		
zygomatic breadth	43.0		39	32.2	39	37.5
inter-orbital breadth	9.0					8.7
breadth braincase						23.4
mastoid breadth						32.2
nasals, length	19.3		23	17		21.3
nasals, greatest breadth	6.5		13	8		11.4
palatal length	26		33.4			
ant. palatal foramina	3.0		3.4			4.6
breadth meso.-pter. fossa	7.2					
width inside m ¹ -m ¹	5.7					
Teeth:						
upper tooththrow					35	31.2
maxillary tooththrow						
crowns m ¹ - ⁴						
crowns p ⁴ -m ⁴	13.0					19.2
crowns m ¹ - ³	8.7		12.4			12.6
i ¹ -m ⁴	27.4					
alveoli m ¹ - ³				13.5		
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	2.8×2.1		3.9×—	4.5×—		4.0×—
m ¹ , length × breadth	3.5×3.3					4.3×3.9
m ² , length × breadth	2.9×2.7					4.1×3.7
m ³ , length × breadth	2.3×2.4					3.9×3.5
m ⁴ , length × breadth	1.8×1.8					3.1×3.0
crowns, m ¹ - ³	8.7					

Pseudochirus, Subgenus *Pseudochirops*
(Continued)

	A.M.100887 <i>albertisi</i> Siwi, Arfak, 700 m.	A.M.101997 ad. ♀ <i>albertisi</i> Gebroeders Mts.	A.M.101996 ad. ♀ <i>albertisi</i> Gebroeders Mts.	<i>beauforti</i> ♂ (type descrip.) Lorentz River	<i>cupreus</i> ad. ♂ Mt. Owen Stanley	A.M.104113 y. ad. ♂ <i>cupreus obscurior</i> Mt. Tafa
Skin:						
head and body		333	320	360	425 ⁴³	393
tail		300	300	310	330 ⁴³	307
hind foot (s.u.)	43?	44.5 ⁴²	45.5 ⁴²			41 ± ⁴²
Skull:						
total length						
condylo-basal length	59.7	60.0	60.0	68.0		
condylo-incisive length	58.9	59.6	59.3			
occipito-nasal length		59.9	60.6			
basal length		57.3	57.2		70 ±	
zygomatic breadth	38.1	38.4	37.7	42.0	47	42.3
inter-orbital breadth	8.0	8.4	7.8	5.5	7.2	6.4
interparietals						
breadth braincase	22.0	23.8	21.9			
mastoid breadth	31.2	31.7	32.2			
nasals, length		20.3	18.5–22	20.0	23.5	22.0
nasals, greatest breadth	13.0	11.4	10.5	11.0	11.8	11.5
palatilar length						
palatal length				36		
ant. palatal foramina	4.1	5.1	4.6			
Teeth:						
upper toothrow	30.9	31.3	30.9	36.6		
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	18.6	19.5	18.5			22.5
crowns m ¹⁻³	12.0	12.5	12.2	14.2	16.0	14.5
crown m ⁴						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	4.0×—	4.5×—	3.9×—		5.5×—	5.0×—
m ¹ , length × breadth	4.1×3.8	4.3×4.1	4.1×3.8			4.9×4.1
m ² , length × breadth	4.0×3.6	4.3×4.0	4.0×3.7			4.7×4.1
m ³ , length × breadth	3.8×3.5	3.9×3.7	3.7×3.4			4.5×4.1
m ⁴ , length × breadth	3.2×3.2	3.1×3.0	2.9×2.8			4.0×4.0

Pseudochirus, Subgenus *Pseudochirops*
(Continued)

	A.M.104114 ad. ♀ <i>cupreus obscurior</i> Mt. Tafa	A.M.104038 juv. ♂ <i>cupreus obscurior</i> Matulu	A.M.104109 ad. ♂ <i>cupreus cupreus</i> Mt. Tafa	A.M.104112 ad. ♂ <i>cupreus cupreus</i> Murray Pass	A.M.104140 (skin) A.M.104149 (skull) <i>cupreus cupreus</i> Field No. 1446	A.M.104035 (pouch) <i>cupreus cupreus</i> Murray Pass
Skin:						
head and body	395		405	415	432	
tail	310		305	322	324	
hind foot (s.u.)	41.5 ± .42	41?	49 ⁴²	52 ⁴²	53	35
Skull:						
total length						
condylo-basal length	70.3		74.4	71.5	75.2	
condylo-incisive length	69.3		73.2	71.0	74.5	
occipito-nasal length	66.0	56	71.4	68.3	72.5	
basal length	66.5		70.2	68.2	71.0	
zygomatic breadth	43.9	35.6	45.2	45.7	47.0	
inter-orbital breadth	7.3		5.9	6.5	7.1	
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	20.0		21-24	22.5-24.5	22.7-24	
nasals, greatest breadth	11.7		11.5	11.9	11.7	
palatilar length						
palatal length			39.5	38.5	40.0	
ant. palatal foramina			5.0	4.8	4.7	
Teeth						
upper toothrow						
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	22.0		23.5	23.6	24.6	
crowns m ¹⁻³	14.5	14.5	15.7	15.6	16.3	
crown m ⁴						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth	4.6×—	4.7×—	5.0×—	5.0×—	5.2×—	
m ¹ , length × breadth	4.9×4.2	4.9×4.1	5.3×4.4	5.2×4.6	5.5×4.7	5.2×4.4
m ² , length × breadth	4.7×4.1		5.0×4.3	5.0×4.6	5.3×4.7	
m ³ , length × breadth	4.4×4.0		4.8×4.25	4.7×4.4	4.8×4.6	
m ⁴ , length × breadth	4.0×3.8		4.2×4.0	4.1×4.0	4.0×4.3	

Pseudochirus, Subgenus *Pseudochirops*
(Continued)

	<i>corinnae</i> type ad. ♂ Mt. Vanapa, Papua	A.M.104111 ad. ♂ <i>corinnae</i> Mt. Tafa	A.M.104116 ad. ♂ <i>corinnae</i> Matulu	A.M.104107 ad. ♂ (skin) A.M.104152 (skull) <i>corinnae</i> (Field No. 1397), Ononge	<i>caesiæ</i> type Mambare R. 1000 m.	<i>argenteus</i> juv. type Sattelburg, 1000 m.
Skin:						
head and body	310 ⁴³	320	342	347	340	360
tail	320 ⁴³	315	314	313	275	200
hind foot (s.u.)		43.5	43.6	44	40	
Skull:						
condylo-basal length		63.0	65.1	65.9	61	
condylo-incisive length						
occipito-nasal length		62.0	63.3	64.3		
basal length	63.5	59.3	61.5	61.5		58
zygomatic breadth	41.0	38.5	39.6	40.0	35.5	38
inter-orbital breadth	7.0	8.1	7.0	7.2	7.7	
interparietals						
mastoid breadth		29.0	28.2	28.9		
nasals, length	23.0	21.1	22.5	23.0	20.7	
nasals, greatest breadth	11.5	10.2	9.8	9.6	8.5	
palatilar length						
palatal length		34.6	36.1	36.8	34	
ant. palatal foramina		5.3	6.0	5.4		
Teeth:						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴		21.0	20.2	20.8		
crowns m ¹⁻³	13.0	14.0	13.2	13.4	12.2	
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth		4.6×—	4.1×—	4.1×—		
m ¹ , length × breadth		4.5×4.1	4.5×4.1	4.4×3.9		
m ² , length × breadth		4.4×4.2	4.3×4.2	4.4×4.0		
m ³ , length × breadth		4.3×4.0	4.25×4.0	4.15×3.9		
m ⁴ , length × breadth		3.2×3.7	3.2×3.6	3.8×3.7		

Pseudochirus,
Subgenus
Pseudochirops
(Continued)

Pseudochirus, Subgenus
Pseudochirulus

	<i>bürgersi</i> ad. ♂ (type descrip.) Schröder Mts.	<i>bürgersi</i> ad. ♂ A.M.79777 Sevia	<i>caroli</i> ad. ♂ A.M.101992 Weyland Mts.	<i>caroli</i> ad. ♂ A.M.101995 Weyland Mts.	♀ A.M.101994 ad. caroli Weyland Mts.	♀ A.M.101993 ad. caroli Weyland Mts.
Skin:						
head and body	335	361	302	318	310	318
tail	250	336	329	335	318	294
hind foot (s.u.)		50	38	39	36	39
Skull:						
condylo-basal length		68.4				
condylo-incisive length						
occipito-nasal length		65.3				
basal length	60.3	64.9	55.0	56.0	56.5	56.1
zygomatic breadth	40	41.7	34.2	36.4	34.9	35.5
inter-orbital breadth	7.6	6.9	6.9	9.0	5.8	7.2
interparietals						
mastoid breadth		31.2	30.3	30.6	30.1	31.0
nasals, length	21.7	23.5	19.7	19.2	19.8	19.4
nasals, greatest breadth	10.4	9.2	8.5	9.2	9.5	8.8
palatilar length						
palatal length		37.3	31.7	32.0	32.3	32.0
ant. palatal foramina		6.1	6.3	5.6	5.0	4.7
Teeth:						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴		20.3	16.8	17.0	16.9	16.1
crowns m ¹⁻³	13.0	13.3	11.0	11.0	11.0	11.2
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³						
milk p ³ , length × breadth						
milk p ⁴ , length × breadth						
perm. p ⁴ , length × breadth		4.0 × —				
m ¹ , length × breadth		4.5 × 3.8				
m ² , length × breadth		4.2 × 3.9				
m ³ , length × breadth		4.0 × 3.7				
m ⁴ , length × breadth		3.5 × 3.7				

Pseudochirus, Subgenus *Pseudochirulus*
(Continued)

	<i>caroli</i> ad. ♂ type Weyland Mts.	<i>versteegi</i> ♀ type Noord River	A.M.101990 ad. ♂ <i>mayeri</i> (Field No. 71) (co- type) Mt. Derimapa, Gebroeders	A.M.101991 ad. ♀ <i>mayeri</i> (Field No. 89) Mt. Derimapa, Ge- broeders.	A.M.100885 juv. ♀ <i>schlegelii</i> ? From Ditschi in Arfak	A.M.100886 ad. ♂ <i>schlegelii</i> ? Swi
Skin:						
head and body	300	315	184	168	205	
tail	370	295	178	170	170	
hind foot (s.u.)	45		20	22	18(?)	
Skull:						
total length			41			
condylo-basal length	61.7	61.0				
condylo-incisive length						
occipito-nasal length						
basal length			37.4	34.7	38.7	47.0
zygomatic breadth	35	34.3	23.9	22.8	24.8	28.8
inter-orbital breadth	7.0	6.8	4.7	4.9	6.1	7.2
interparietals						
breadth braincase						
mastoid breadth		30.0	18.2	18.2	24.2	25.2
nasals, length	18	21.0	13.2	12.4		16.3
nasals, greatest breadth	10.3	8.8				8.5
palatilar length						
palatal length	33.0	32.5	21.1			
ant. palatal foramina			3.2	3.3	3.1	4.2
post. palatal foramina						
breadth meso.-pter. fossa						
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
upper toothrow		44				
maxillary toothrow						
crowns m ¹ - ⁴						
crowns p ⁴ -m ⁴			12.2	11.0		13.7
crowns m ¹ - ³	10.6	11.0	8.0	7.4	9.1	8.5
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹ - ³						

Pseudochirus, Subgenus *Pseudochirulus*
(Continued)

	<i>pigmaeus</i> ad. ♀ (type) Sumuriberg	<i>dammermanni</i> sex ? (type) young N. Dutch Guinea	<i>schlegelii</i> ad. ♂ (type) Arfak Mts.	<i>levisi</i> ad. ♂ (type) Arfak Mts.	A.M.104128 y. ad. ♂ <i>avarus</i> Matsika	A.M.104125 ad. ♂ <i>avarus</i> Matsika
Skin:						
head and body	192	152		253	242	265
tail	180	173		248	213	220
hind foot (s.u.)	22	22	30	29		
hind foot (c.u.)				34		
Skull:						
total length		38		51.5		
condylo-basal length	40.2					
condylo-incisive length						
occipito-nasal length						
basal length			51		46	47.8
zygomatic breadth	23.2		30	30	30.6	30.2
inter-orbital breadth	4.8				6.9	7.1
interparietals						
breadth braincase						
mastoid breadth					24.4	25.0
nasals, length			16	15	16.9	
nasals, greatest breadth			7.1		7.4	7.0
palatilar length						
palatal length			27		26.3	26.9
ant. palatal foramina			4.2		4.1	3.9
post. palatal foramina						
breadth meso-pter. fossa						
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
upper tooththrow				25.5		
maxillary tooththrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴					12.6	12.6
crowns m ¹⁻³		45	10.0		7.8	7.9
crown m ⁴						
i ¹ -m ⁴						

Pseudochirus, Subgenus *Pseudochirulus*
(Continued)

	A.M.104124 ad. ♂ <i>avarus</i> Matsika	A.M.104137 ad. ♀ <i>avarus</i> Matsika	A.M.104139 y. ad. ♀ <i>avarus</i> Matsika	<i>avarus</i> ad. ♂ (type descrip.) Port Moresby	A.M.104129 ad. ♀ <i>forbesi forbesi</i> Matsika	A.M.104123 ad. ♀ <i>forbesi forbesi</i> Matsika
Skin:						
head and body	278	282	252	250	255	255
tail	207	218	218	210	237	245
hind foot (s.u.)				29		
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	50.5	49.4	45.0		47.0	45.6
zygomatic breadth	31.5	30.7	28.8	29.5	28.4	28.2
inter-orbital breadth	7.1	7.7	5.8	7.2	6.3	6.2
interparietals						
breadth braincase						
mastoid breadth	24.4	25.3	24.4		25.6	23.2
nasals, length	19.6	19.0	15.7	17	17.4	16.5
nasals, greatest breadth	7.2	7.0	6.7	6.6	8.0	7.0
palatilar length						
palatal length	28.9	27.7	25.1	25.5	25.4	24.5
ant. palatal foramina	4.8	4.6	4.1	5	4.0	3.7
post. palatal foramina						
breadth meso.-pter. fossa						
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
upper tooththrow						
maxillary tooththrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	12.7	13.0	13.0		13.7	13.7
crowns m ¹⁻³	8.0	8.0	8.2	7.6	9.0	8.8
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						

Pseudochirus, Subgenus *Pseudochirulus*
(Continued)

	A.M.104119 y. ad. ♀ <i>forbesi forbesi</i> Bellavista	A.M.104131 ad. ♂ <i>forbesi forbesi</i> Matsika	A.M.104133 y. ad. ♂ <i>forbesi forbesi</i> Matsika	A.M.104132 y. ad. ♂ <i>forbesi forbesi</i> Matsika	A.M.104130 ad. ♂ <i>forbesi forbesi</i> Matsika	A.M.104118 ad. ♂ <i>forbesi forbesi</i> Bellavista
Skin:						
head and body	251	301	240	265	267	272
tail	246	278	245	245	270	283
hind foot (s.u.)		"39"		32		
hind foot (c.u.)						
metatarsal						
ear						
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	45.3	53.8	47.2	51.6	49.9	49.8
zygomatic breadth	28.3	32	28.7	30.6	30.0	30.2
inter-orbital breadth	6.2	7.2	5.9	6.5	5.8	6.9
interparietals						
breadth braincase						
mastoid breadth	25.4	28.4	26.2	26.6	28.0	28.7
nasals, length	16.6	18.9	17.1	18.4	17.5	17.0
nasals, greatest breadth	7.9	9.0	7.6	9.0	8.0	6.9
palatilar length						
palatal length	25.0	29.1	26.5	28.3	27.2	27.2
ant. palatal foramina	3.9	5.2	4.4	4.1	4.1	4.1
post. palatal foramina						
breadth meso.-pter. fossa						
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹ - ⁴						
crowns p ⁴ -m ⁴	15.3	14.2	14.6	14.4	14.6	15.2
crowns m ¹ - ³	10.0	9.2	9.7	9.3	9.3	10.0

Pseudochirus, Subgenus *Pseudochirulus*
(Continued)

	A.M.104117 ad. ♂ <i>forbesi forbesi</i> Bellavista	A.M.104108 ad. ♂ <i>forbesi forbesi</i> Mt. Taifa	<i>forbesi</i> ad. ♂ (type) Sogere, Astrolabe Mts.	A.M.104036 ad. ♂ <i>forbesi longipilis</i> Mt. Taifa	A.M.104037 y. ad. ♂ <i>forbesi longipilis</i> (type) Mt. Taifa	A.M.79784 ad. ♂ <i>larvatus</i> Sevia, Huon
Skin:						
head and body	265	284	280 ±	264	256	296
tail	270	276	230	241	259	305
hind foot (s.u.)			30	35 ⁴²		42
hind foot (c.u.)						
metatarsal						
ear						
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	50.0	51.4	47.7	49.4	46.2	58.6
zygomatic breadth	31.2	33.0	30.0	30.5	29.2	34.7
inter-orbital breadth	7.1	6.6		6.1	5.8	7.9
interparietals						
breadth braincase						
mastoid breadth	29.5	29.6		27.2	25.2	32.5
nasals, length	17.0	19.6			16.3	21.4
nasals, greatest breadth	8.2	8.7		7.3	7.6	8.0
palatilar length						
palatal length	27.3	27.9		26.9	25.2	32.6
ant. palatal foramina	4.0	4.6		4.2	4.1	4.2
post. palatal foramina						
breadth meso.-pter. fossa						
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
upper tooththrow						
maxillary tooththrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	14.7	14.3		13.9	14.6	16.2
crowns m ¹⁻³	9.7	9.3	8.8	9.0	10.0	10.7

Pseudochirus, Subgenus *Pseudochirulus*
(Continued)

	A.M.79775 ad. ♂ <i>larvatus</i> Sevia, Huon	A.M.79776 juv. ♂ <i>larvatus</i> Sevia, Huon	<i>larvatus</i> ♂ (type) Rawlinson Mts.	<i>capistratus</i> juv. ♀ (type) Mt. Schröder	<i>pyrator</i> y. ad. ♂ (type) Gira River	<i>canescens</i> ad. ♀ (type) Triton Bay
Skin:						
head and body	305		340	165	240	260
tail	305		230-250	135	175	205
hind foot (s.u.)	40			27	30	32
hind foot (c.u.)				28.5		
metatarsal						
ear						
Skull:						
total length				43.1		
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	59.2				43.3	50.4
zygomatic breadth	33.9			26.0	28.0	31.2
inter-orbital breadth	7.6			5.3		7.0
interparietals						
breadth braincase						
mastoid breadth	32.0					
nasals, length	21.5			13.7	16.0	18.5
nasals, greatest breadth	8.6				6.2	8.1
palatilar length						
palatal length	33.7			24.5 ±	24.5	28.0
ant. palatal foramina	4.6					4.2
post. palatal foramina						
breadth meso.-pter. fossa						
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
upper tooththrow					46	
maxillary tooththrow						
crowns m ¹ - ⁴						
crowns p ⁴ -m ⁴	16.0					
crowns m ¹ - ³	10.6	10.5		10.0	8.2	8.5

Macropus, Subgenus *Protemnodon*

	A. M. 104383 ad. ♂ <i>agitis papuanus</i> Oriomo River	A. M. 104408 ad. ♂ <i>agitis papuanus</i> Oriomo River	A. M. 104409 y. ad. ♂ <i>agitis papuanus</i> Oriomo River	A. M. 104427 juv. ♂ <i>agitis papuanus</i> Oriomo River	A. M. 104432 (pouch young) <i>agitis papuanus</i> Oriomo River	A. M. 104425 y. ad. ♀ <i>agitis papuanus</i> Oriomo River
Skin:						
head and body	870	860	823	639	458	647
tail	770	700	727	552	353	523
hind foot (s.u.)	230	220	250	197	143	195
hind foot (c.u.)						
metatarsal						
ear						
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	145	138	137	110	80.5	131
zygomatic breadth	83	79	79	67	52.3	76.2
inter-orbital breadth						
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	70	64	60	51		63.5
Teeth:						
upper tooththrow						
maxillary tooththrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴						
crowns m ¹⁻³						
crown m ⁴						
milk p ³ , length × breadth				7.9×4.1	8.0×4.4	
milk p ⁴ , length × breadth				6.2×5.6	7.0×5.4	
perm. p ⁴ , length × breadth	10×5	10.4×5.6	10.0×4.8			9.5×4.9
m ¹ , length × breadth	7.2×6.2	7.6×6.8	7.5×6.7	7.6×6.5	7.5×6.1	7.4×6.5
m ² , length × breadth	9.2×7.5	9.7×7.6	9.1×7.3	9.0×7.3		9.0×6.8
m ³ , length × breadth	10.2×7.7	10.4×7.6	10.3×7.6			10.0×7.5
m ⁴ , length × breadth	10.4×8.3	11.1×7.7				

Macropus, Subgenus *Protemnodon*
(Continued)

Macropus
Subgenus
Thylogale

	A.M.10421 y. ad. ♀ <i>agitis papuanus</i> Oriomo River	A.M.10412 y. ad. ♀ <i>agitis papuanus</i> Oriomo River	A.M.10438 juv. ♀ <i>agitis papuanus</i> Oriomo River	A.M.10431 juv. ♀ <i>agitis papuanus</i> Oriomo River	A.M.10435 juv. ♀ <i>agitis papuanus</i> Oriomo River	<i>lauterbachii</i> ♂ (type descr.) Finsch Harbor, Huon Pen.
Skin:						
head and body	660	670	588	626	647	580
tail	510	540	476	499	574	320
hind foot (s.u.)	195	190	168	185	207	130
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	120		106	113	117	91.5
zygomatic breadth	70.3	75.4	67.7	67.2	67.3	52
inter-orbital breadth						
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	56	64	52		54	35.5
nasals, greatest breadth						
palatilar length						
palatal length						
ant. palatal foramina						
post. palatal foramina						
breadth meso.-pter. fossa						
width inside m ¹ -m ¹						
length bulla						
length mandible						
Teeth:						
upper tooththrow						
crowns m ¹⁻⁴						30.0
milk p ³ , length × breadth			7.3×4.0	7.5×4.2	7.9×4.4	
milk p ⁴ , length × breadth			6.2×5.0	6.4×5.2	6.4×5.6	
perm p ⁴ , length × breadth	9.2×4.8	10.0×4.9				
m ¹ , length × breadth	7.1×6.3	7.8×6.9	9.4×5.7	7.4×6.0	7.8×6.5	
m ² , length × breadth	8.6×7.1	9.4×7.5	8.6×6.2	9.0×6.5	8.8×6.4	
m ³ , length × breadth	9.3×7.2	10.1×7.6				

Macropus, Subgenus *Thylogale* (Continued)

	<i>lauerbachi</i> ad. ♀ (type descrip.) Fisch Harbor, Huon Pen.	A.M. 104433 y. ad. ♂ <i>lauerbachi</i> Orionno River	A.M. 104426 y. ad. ♀ <i>lauerbachi</i> Orionno River	A.M. 104436 juv. ♂ <i>lauerbachi</i> Orionno River	A.M. 104423 juv. ♀ <i>lauerbachi</i> Orionno River	A.M. 99851 ad. ♂ <i>brownii</i> New Britain
Skin:						
head and body	590	549	496	416	372	667
tail	330	385	360	260	265	459
hind foot (s.u.)	120	130	117	107	101	167
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	93.5	95.0	92.0	72.0	69.8	98.0
zygomatic breadth		51.9	51.0	44.3	43.0	56.1
inter-orbital breadth						
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	36.5	38.9	39.0			38.0
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹⁻⁴	30.1					
crowns p ⁴ -m ⁴						
crowns m ¹⁻³		20.2	19.5			
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³		6.4	6.5			
milk p ³ , length × breadth				6.2×3.9	6.1×3.7	
milk p ⁴ , length × breadth				5.7×4.7	5.7×4.3	
perm. p ⁴ , length × breadth		8.3×4.5	8.3×4.0			6.5×3.8
m ¹ , length × breadth		6.0×5.7	5.7×5.3	5.8×5.5	5.6×5.4	4.9×5.0
m ² , length × breadth		6.8×6.1	6.5×5.8	6.2×5.8		5.7×5.6
m ³ , length × breadth		7.3×6.7	6.9×6.4			6.7×5.9
m ⁴ , length × breadth						6.7×5.6

Macropus, Subgenus *Thylogale* (Continued)

	A.M.104075 y. ad. ♂ <i>keysseri lanatus</i> Mt. Tafa	A.M.79788 juv. ♀ <i>keysseri lanatus</i> Cronwell Mts.	A.M.104429 ad. ♂ <i>corenii orionio</i> (type) Orionio River	A.M.104430 y. ad. ♂ <i>corenii orionio</i> Orionio River	A.M.104414 juv. ♂ <i>corenii orionio</i> Orionio River	A.M.104420 juv. ♂ <i>corenii orionio</i> Orionio River
Skin:						
head and body	515	533	575	552	469	372
tail	350	356	390	344	354	258
hind foot (s.u.)	125	120	117	115	116	102
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	89.0	87.0	95.0	91.0	81.0	73.3
zygomatic breadth	51.0	53.0	52.0	50.7	47.0	42.3
inter-orbital breadth						
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	32.0	32.3	40.1	38.0	32.0	
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴						
crowns m ¹⁻³			17.4	17.1		
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³			5.3	5.1		
milk p ³ , length × breadth		5.3×3.2			4.9×3.0	5.2×3.2
milk p ⁴ , length × breadth		5.4×4.3			4.4×3.9	4.7×4.1
perm. p ⁴ , length × breadth	6.7×3.2		7.3×3.6	7.3×3.4		
m ¹ , length × breadth	5.3×5.4	5.3×5.2	5.0×4.7	4.6×4.8	5.0×4.6	4.8×4.7
m ² , length × breadth	6.0×5.6	6.0×5.6	5.9×5.2	5.9×5.1	5.8×5.1	5.7×5.0
m ³ , length × breadth	6.7×5.7	6.5×5.9	6.1×5.2	6.0×5.3	6.1×5.3	
m ⁴ , length × breadth	6.2×5.4		6.3×5.4	6.2×5.1		

Macropus, Subgenus
Thylogale (Continued)

Dorcopsis,
Subgenus
Dorcopsis

Subgenus
Dorcopsulus

	A.M.104415 juv. ♀ <i>cozzenti orlomo</i> Orlomo River	A.M.104437 juv. ♀ <i>cozzenti orlomo</i> Orlomo River	A.M.104088 y. ad. ♂ <i>luctuosa</i> Kubuna	A.M.104077 ad. ♀ <i>luctuosa</i> Kubuna	A.M.104087 ad. ♂ <i>macleani</i> Mafulu, Papua	A.M.104082 y. ad. ♂ <i>macleani</i> Mafulu, Papua
Skin:						
head and body	395	385	515	495	450	395
tail	265	279	345	330	330	355
hind foot (s.u.)	105	92	110	105	108	105
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	72.2	72.5	98	94	80	76
zygomatic breadth	44.0	43.1	59.7	52.1	45.4	
inter-orbital breadth						
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	29.0	26.8	46	40.5	37.0	35.4
Teeth:						
upper toothrow						
maxillary toothrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴				37.4	29.3	28.4
crowns m ¹⁻³			17.5	17.6	14.3	14.2
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³			3.5	3.5	2.8	2.9
milk p ³ , length × breadth	5.0×3.0	5.1×3.1				
milk p ⁴ , length × breadth	4.5×4.0	4.6×3.9				
perm. p ⁴ , length × breadth			12.7×4.9	13.0×4.8	9.8×3.5	9.8×3.6
m ¹ , length × breadth	5.1×4.8	4.8×4.5	5.3×5.3	5.3×5.4	4.3×4.2	4.1×4.0
m ² , length × breadth	5.8×5.1	5.5×4.9	5.7×5.6	5.7×5.7	4.6×4.5	4.5×4.3
m ³ , length × breadth			6.5×5.9	6.5×6.0	5.0×4.8	4.9×4.6
m ⁴ , length × breadth				6.3×5.5	4.9×4.6	4.9×4.5

Dorcopsis, Subgenus *Dorcopsulus* (Continued)

	A.M.104086 ad. ♀ <i>macleayi</i> Mafulu, Papua	A.M.104084 juv. ♀ <i>macleayi</i> Mafulu, Papua	A.M.104081 y. ad. ♂ <i>rothschildi</i> Mt. Tafa	A.M.104076 juv. ♂ <i>rothschildi</i> Mt. Tafa	A.M.104034 juv. ♂? <i>rothschildi</i> Mt. Tafa	A.M.79787 ad. ♂ <i>rothschildi</i> Cromwell Range
Skin:						
head and body	515	332		377	242	
tail	233	284		273	226	
hind foot (s.u.)	98	82	99	95	73	92 ±
Skull:						
total length						
condylo-basal length						
condylo-incisive length						
occipito-nasal length						
basal length	75.1	60.2		64.2	49.0	74.7
zygomatic breadth	44.0	39.3		40.2	34.0	44.0
inter-orbital breadth						
interparietals						
breadth braincase						
mastoid breadth						
nasals, length	35.1	27.0	33.0	29.0	21.0	32.9
Teeth:						
upper tooththrow						
maxillary tooththrow						
crowns m ¹⁻⁴						
crowns p ⁴ -m ⁴	27.1		26.2			27.3
crowns m ¹⁻³	13.2		13.2			13.4
crown m ⁴						
i ¹ -m ⁴						
alveoli m ¹⁻³						
crowns m ¹⁻²						
crown i ³	2.5		2.9			2.6
milk p ³ , length × breadth		5.3×3.2		5.5×3.0	5.2×2.8	
milk p ⁴ , length × breadth		4.3×3.3		4.5×3.6	4.0×3.1	
perm. p ⁴ , length × breadth	8.7×3.3		8.5×3.5			8.1×3.7
m ¹ , length × breadth	3.8×4.2	3.9×4.1	4.1×4.1	4.2×4.2	3.9×4.0	4.0×4.2
m ² , length × breadth	4.2×4.3	4.4×4.0	4.2×4.4	4.4×4.5		4.3×4.2
m ³ , length × breadth	4.9×4.5		4.6×4.7	4.6×4.7		4.8×4.6
m ⁴ , length × breadth	4.7×4.4		4.3×4.4			4.4×4.1

Dendrolagus

	A.M.104080 juv. ♂ <i>dorianus</i> Mafulu, Papua	A.M.104079 ad. ♀ <i>dorianus</i> Mafulu, Papua
Skin:		
head and body	515	713
tail	435	540
hind foot (s.u.)	95	111
Skull:		
total length		
condylo-basal length		
condylo-incisive length		
occipito-nasal length		
basal length	88	115
zygomatic breadth	57.6	69.7
inter-orbital breadth	20.5	19.7
nasals, length	36.2	48.0
nasals, greatest breadth		
palatilar length		
palatal length	53.0	67.0
Teeth:		
upper toothrow		
maxillary toothrow		
crowns m ¹⁻⁴		
crowns p ⁴ -m ⁴		37.5
crowns m ¹⁻³		20.8
crown m ⁴		
i ¹ -m ⁴		
alveoli m ¹⁻³		
crowns m ¹⁻²	13.1	13.3
crown i ³		
milk p ³ , length × breadth	6.1×5.0	
milk p ⁴ , length × breadth	5.9×5.3	
perm. p ⁴ , length × breadth		9.5×6.7
m ¹ , length × breadth	6.5×6.1	6.5×6.1
m ² , length × breadth	6.7×6.2	6.8×6.4
m ³ , length × breadth		7.1×6.5
m ⁴ , length × breadth		7.3×6.4

FOOTNOTES FOR TABLES OF MEASUREMENTS

- ¹ Measured on skin.
- ² "Upper molar row," 11.6.
- ³ Error?
- ⁴ Stuffed.
- ⁵ Measured from plate 27.
- ⁶ c-m⁴, 23.5.
- ⁷ c-m⁴, 25.6.
- ⁸ c-m⁴, 26.0.
- ⁹ c-m⁴, 25.4.
- ¹⁰ c-m⁴, 32.8.
- ¹¹ Stuffed skin.
- ¹² c-m⁴, 34.4.
- ¹³ c-m⁴, 34.0.
- ¹⁴ c-m⁴, 35.5.
- ¹⁵ m¹⁻⁴ = 8.8 (type); 8.0 (A.M.103262).
- ¹⁶ c-m⁴, 23.4.
- ¹⁷ c-m⁴, 27.7.
- ¹⁸ c-m⁴, 29.5.
- ¹⁹ c-m⁴, 26.7.
- ²⁰ c-m⁴, 29.3.
- ²¹ c-m⁴, 25.3.
- ²² c-m⁴, 27.4.
- ²³ c-m⁴, 35.0.
- ²⁴ Tooth widths taken across posterior half of molar.
- ²⁵ c-m⁴, 31.3.
- ²⁶ c-m⁴, 34.0.
- ²⁷ c-m⁴, 30.0.
- ²⁸ c-m⁴, 29.0.
- ²⁹ c-m⁴, 31.0.
- ³⁰ c-m⁴, 30.0.
- ³¹ c-m⁴, 30.9.
- ³² Mjöberg calls this tooth "p³."
- ³³ Crowns p²-m⁴, 8.2.
- ³⁴ Crowns p²-m⁴, 8.1.
- ³⁵ Crowns p²-m⁴, 8.0.
- ³⁶ Crowns p²-m⁴, 7.5.
- ³⁷ Crowns p²-m³, 6.5.
- ³⁸ Crowns p²-m³, 6.5.
- ³⁹ "Upper length," 59.
- ⁴⁰ "Upper length," 60.
- ⁴¹ Probably stretched.
- ⁴² Remeasured.
- ⁴³ Calculated.
- ⁴⁴ "Dental length," 31.5.
- ⁴⁵ "Combined length of first 2 molariform teeth, 6." [p⁴ + m¹, or m¹ + m²?.]
- ⁴⁶ Total length, 24.5.

