THREE NEW BATS OF THE GENERA *PTEROPUS*, *NYCTIMENE*, AND *CHAEREPHON* FROM MELANESIA.

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[Read 24th June, 1931.]*

During 1928 a very interesting collection of fishes and mammals was received from Mr. H. Ian Hogbin, from Ongtong Java, Lord Howe's Group, where he was engaged in anthropological research. As the single fruit-bat seemed hardly mature, Mr. Hogbin supplied the name of Mr. T. B. Walton, a resident of the Group, who very kindly took charge of a collecting can and returned it with three adults and a juvenile. Thanks to these joint efforts I am able to describe a new species of *Pteropus*, providing the first record of the genus in this Group.

The specimen of tube-nosed bat described herein was presented to the Museum by the Reverend Actaeon Forrest in July, 1892, associated with some other bats and fishes, from the Santa Cruz Group. This apparently new form considerably extends the range of the genus *Nyctimene*, not hitherto recorded southward of Guadalcanar Island in the Solomons.

The third species described is an insectivorous bat of the wrinkle-lipped genus, *Chaerephon*, and constitutes the first record of the occurrence of the Family Molossidae in the Solomons. An excellent series of more than a hundred specimens of this species was included in a fine collection of bats received from Mr. N. S. Heffernan, Honorary Correspondent of the Museum, while he was stationed as District Officer at Ysabel Island. For this opportunity, provided by his keen work as a voluntary collector, my sincere thanks are gratefully recorded.

Pteropus howensis, n. sp.

Diagnosis.—Of the *Pt. hypomelanus* group and apparently intermediate between *Pt. admiralitatum* and *colonus*. Though most dimensions accord well with those of *admiralitatum*, the individual teeth are heavier and the colour is very much lighter, approaching that of the true *hypomelanus*, and fur of back is much shorter than in the former; the dimensions are decidedly smaller than those of the nearest race of the latter. The forearm is considerably larger than the range given for *colonus* which, however, has a proportionately larger skull, but smaller teeth. Forearm, two adult females, 118–122 mm. Habitat: Lord Howe's Group (Ongtong Java).

Colour.—Back in the adult female holotype and paratype ranging from auburn (Ridgway, 1912), through dark-auburn to a dark-vandyke shade of brown on the rump, intermingled with a soft pencilling of buffy-white hairs. Mantle ranging from deep olive-buff with a cinnamon tinge at the nape in a young male and the palest female (paratype); in the darker holotype female the mantle ranges from cinnamon to dark-clay colour with a lighter, more buffy, hind edge. Fur of mantle strongly bicoloured; a dark mummy-brown basally. Head of holotype not markedly

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contrasting with back, the light mantle colour only extending on to the head as an intermingling with the general vandyke or prout's brown tone; the cheeks, sides of neck, and throat ranging from deep-auburn to dark vandyke-brown. In the female and young male paratypes the head contrasts strongly with the back owing to the extension of the olive-buffy tone of the mantle to between the eyes, where it also mingles with the pale-vandyke shade of the cheeks.

Undersurface: In the holotype, ranging from prout's to dark prout's; though too dark for vandyke-brown, there is a distinct tone of it present, especially on the sides; and a sprinkling of silvery-buff hairs in the centre of the belly. Undersurface of the female paratype much lighter, the chest and upper parts of belly being heavily tipped with a pale shade of deep olive-buff, becoming more buffy posteriorly; the sides are clear light prout's to vandyke, lacking the pale tipping of the centre. The undersurface of the immature male agrees with this paler female, but its back and mantle are of a decidedly paler more buffy tone than in the adult females. In the paler paratypes a broad washing of the mantle colour extends across the undersurface, contrasting with the dark throat and merging into the pale tipping of the chest; in the darker holotype there is only a narrow band of paler tips, about 15 mm. broad, contrasting with both throat and chest.

External characters.—Forearms of adult females (paratype with young) 118–122 mm., as opposed to 118–126 in four adults of both sexes of *admiralitatum*; proportionately the digital dimensions average slightly longer, notably in specimens of similar forearm-length. The second digit metacarpal is 64–66·5 against 60–63·5, and the fourth digit metacarpal 81–81·5 against 75·5–81. Tibia naked above and below, though the fur which extends along the interfemoral for about half the tibia-length, as in *Pt. hypomelanus*, encroaches sparsely on to the inner third of the tibia. Fur of back adpressed and from 8 to 11 mm. long, much shorter than in *admiralitatum* (16–18), and even rather short compared with *hypomelanus* (10–14). Ears short and broad, though slightly narrower than in the former, the outer margin slightly concave below the tip, which reaches between half and two-thirds the distance to the eye, when laid forward.

Skull and teeth.—The skull proportionately somewhat narrower though general dimensions much as in *admiralitatum*, the orbital diameter smaller (11·2–3 against 12–12·5), and mandible proportionately shorter, its length 43·2–7 against 45–46·7. Individual teeth decidedly heavier than in *admiralitatum*; p^3 (maximum) 4·3 × 3·2 against 4·1 × 3, p^4 4·4 × 3·5 against 4·1 × 3·1, and p_4 4·6 × 3·2 against 4·2 × 3.

Palate ridges.—No trace of the extra ridge between the normal 9th and 10th. The 8th showing a slight variation from the *hypomelanus* description in terminating behind instead of at m^2, though not extending backwards to the marked degree of succeeding ridges.

Dimensions of holotype.—In spirit: Forearm 122; 3rd digit, metacarpal 82·5, 1st phalanx 61, 2nd 85·5; ear, from orifice 21, width 14·5; tibia 53; foot c.u., 37 mm.

Skull: Total length to gnathion 55; palation to incisive foramina 26; width, braincase at zygomata 19·7; zygomatic width 29·2; constriction, interorbital 7·2, postorbital 7·3; orbital diameter 11·2; mandible, length 43·2, coronoid height 19·4; upper teeth, $c–m^2$ (crowns) 21·3; lower, $c–m_3$ 23·6 mm.

Specimens examined.—The holotype female No. M.4408, female paratype M.4824, and two juvenile male paratypes M.4825–6, in the Australian Museum, collected and presented by Messrs. H. I. Hogbin, B.Sc., and T. B. Walton.

Range.—Ongtong Java, Lord Howe's Group, Melanesia. Native name "He pe ia", supplied by Mr. Hogbin.

Remarks.—From recent observations of the British Museum series described by Andersen, there is no doubt that this form is distinctly lighter in colour than *admiralitatum*. According to my notes, the latter are actually darker than his description suggests, and therefore more in accord with the statement that their colour approaches the north Polynesian species of the *Pt. mariannus* group. Apart from the difference of colour, *howensis* is differentiated from *admiralitatum* by the much shorter hair of the back, and relatively broader and heavier teeth; from *colonus* by the longer forearm range and from the nearest races of *hypomelanus*, by the much smaller dimensions.

The much smaller dimensions distinguish it from the nearest local races of *hypomelanus*, the cranial and external measurements being actually much smaller than in *Pt. hypomelanus enganus* which averages according to Andersen "in every respect smaller than any other known race of the species"; teeth averaging about equal, but width occasionally greater than in the larger skulled *enganus*. The comparatively greater width of the teeth in *howensis* is indicated by the width of m^1, p_4 and m_1 equalling the width of these much longer teeth in *hypomelanus canus* and *lepidus*, whose teeth average the largest for the species.

Nyctimene sanctacrucis, n. sp.

Diagnosis.—Allied to *N. scitulus* but differing in that the female holotype is quite as dark as the males of that species, instead of being of a lighter, creamy-brown, tone as in the females of the allied *scitulus* and *geminus*. Second phalanges of the 3rd and 4th digits considerably shorter than the range shown for *scitulus*, and the ear definitely smaller. The skull appears to be relatively shorter and the rostrum proportionately longer, the orbital diameter larger, and the teeth heavier. Forearm, damaged, approximately 75 mm. Habitat: Santa Cruz Group.

Colour.—Back of the female holotype quite as dark as in males of *scitulus*, the tone being mottled wood and buffy-brown with a washing of cinnamon drab; the general effect is buffy-brown rather than the purplish shade of the "brownish drab" of Andersen's description. The definite narrow spinal stripe is a shade of mummy-brown rather than the seal-brown described for *scitulus*. Undersurface much as in the description of females of *scitulus*, but the buffy-isabella tone is restricted to the sides of the neck, chest, and upper belly; the sides of body and the lower belly being buffy-brown tinged with wood-brown.

External characters.—Second phalanges of 3rd and 4th digits shorter than the range of *scitulus*, 46·5 against 52–58·5, and 31·5 to a minimum of 32 mm., in a specimen with a much smaller forearm. Ear smaller, 11·5 × 8·3 against 13–14 × 10–11·5.

Skull and teeth.—The rostrum relatively longer, and dimensions of skull wider in proportion to length than in *scitulus*, excepting the interorbital width which is 6·3 against 6·6–6·8. Orbital diameter decidedly larger, 9·2 against 8·7–8·8. Coronoid height equalling that of a much longer skull of *scitulus*, as do the general dimensions of the teeth.

Dimensions of holotype.—Dried skin: Forearm, approximately, 75; 3rd digit, metacarpal 53, 1st phalanx 41·5, 2nd 46·5; ear, from orifice (wet) 11·5, width 8·3; tibia 25; foot c.u., about 17 mm.

Skull: Length from lambda to gnathion 34·5; palation to incisive foramina 14; rostrum, orbit to nares, 7·5; width of braincase at zygomata 14; across crowns of m^1–m^1 externally 11·1; lachrymal width 9·9; across crowns of canines externally 7·4; premaxillae, depth at symphysis, 2·7; constriction, interorbital 6·3, postorbital

5·8; orbital diameter 9·2; mandible, length from condyle 28·2, coronoid height 18·4. Upper teeth, c–m^1 (crowns) 12·9; lower, c–m_2 14·2 mm.

Specimen examined.—The holotype dried female, No. M.711 in the Australian Museum collection. Presented by the Reverend Actaeon Forrest in July, 1892.

Range.—The Santa Cruz Group, Melanesia.

Remarks.—Though the actual locality was not recorded, the distance, about 350 miles, between the Santa Cruz Group and Guadalcanar in the Solomons, the nearest known habitat for the genus, appears to preclude the possibility of casual migration, or likelihood of error by the donor in recording the habitat.

The available specimens of *scitulus* appear to be decidedly darker than described by Andersen; therefore as my holotype female agrees with the darkest males of *scitulus*, instead of being much lighter as in females of that species, coloration alone would seem to differentiate the two forms, apart from the additional diagnostic features given. The fact that the female is as dark as Solomon Group males is a further indication of isolation from the species of that area, as is the fact that the Santa Cruz specimen was accompanied by two species of insectivorous bats which are identical with forms secured by Mr. A. A. Livingstone and myself during our visit to the Santa Cruz Group.

Chaerephon solomonis, n. sp.

Diagnosis.—Intermediate in size between *Ch. luzonus* and *plicatus*; the forearm-length the same as in *luzonus*, but the teeth, skull, and head and body dimensions decidedly larger, and also lacking the almost pure-white throat and lower belly described for *luzonus*.

General colour of similar but much richer tone, the forearm much shorter, 40·5–45 against 48·5–50, and the skull, teeth, and general dimensions decidedly smaller than in *plicatus colonicus*, the nearest ally.

External characters.—Ear similar in outline but noticeably smaller and thicker, and the antitragus narrower and shorter than in *plicatus colonicus*. Tragus broadened at the top, which is divided into anterior and posterior lobes, more or less pronounced according to the degree of concavity; in females the tragus is definitely smaller and less concave above, the upper outline therefore less markedly bilobate. Tragus thus differing from that of *plicatus colonicus*, in which the more broadly wedge-shaped tragus has a straight or slightly convex upper profile, which is never indented to form lobes. Fur of back closer, shorter, and more rigid than in *plicatus colonicus*.

Colour.—Back an even shade of auburn prout's brown which is clearer and brighter than the fuscous-tipped prout's of *plicatus colonicus*; sprinkled with occasional white hairs. Undersurface darker than in the allied subspecies, washed with dull-bistre instead of the paler wood-brown of that form.

Palate-ridges.—The hindmost ridge is never double except in its outer third, where it bifurcates to isolate a small depression opposite the antero-internal corner of m^2, thus differing from *plicatus colonicus* in which the posterior ridge is double throughout its length. There exist, therefore, excluding a very faint inter-canine one, but four ridges in *solomonis*, opposed to five in *plicatus colonicus*.

Skull and teeth.—Skull similar in general appearance but decidedly smaller than in *plicatus colonicus*, and the upper profile much more sinuate, the convexity in outline and development of the sagittal crest in the forepart of the braincase being much more pronounced. This greater development of the sagittal crest apparently also serves to distinguish it from the true *plicatus* which according to

Dimensions of *Chaerephon luzonus*, *solomonis*, and *plicatus colonicus*.

	Ch. luzonus. Holotype ♂. Luzon, Philippines.	*Ch. solomonis*, n. sp.				*Ch. plicatus colonicus*.	
		Holotype ♂. M.3606.	Allotype ♀. M.3636.	200 specimens.		Adult ♂. Burketown, North-west Queensland.	Holotype ♂. Alexandria, North Australia.
				M.3632. Minimum ♂.	M.3627. Maximum ♂.		
Forearm	44·4	44·2	44	40·5	45	49·5	50
Head and body	54	67	68	63	68	72·5	67
Tail	33	36·5	35	35	36	40·5	42
Third digit, metacarpal		43·5	43·5	40	45	49·5	50
Third digit, first phalanx		17·8	17·2	16·8	18	19·3	21
Third digit, second phalanx		16·8	17	15·5	17	19·4	22
Third digit, third phalanx		7·2	7	6·5	7	9	
Fifth digit, metacarpal		25	24	23	25	29	
Ear, length from back of head		12·5	12·5	12·7	12·5	15	
Ear, length from base of antitragus		19·5	18·8	19·2	20·5	20·5	22
Ear, greatest width		16·5	16·5	14·5	16·5	18	
Lower leg		14·5	14	13·5	15·5	19	18
Foot c.u.	10	8·9	8·9	8·5	9	9·5	
Skull.							
Greatest length	17·6	19·2	18·6	17·9	19	21	
Length to occipital crest		19	18·3	18	18·8	21·5	22
Condylobasal length	16·2	17·7	17	16·6	17·5	19·5	
Basal length		15·8	15	14·7	15·6	17·8	17·7
Zygomatic width	10	11·5	10·5	10·6	11		13·5
Mastoid width	9·6	10·8	10·2	10·3	10·5	11·5	12
Palatal length		7·7	7·3	7·2	7·7	8·9	
Interorbital constriction	3·1	4	3·9	3·8	3·9	4·5	
Mandible length	11·8	13·3	13	12·8	13·2	14·6	
Teeth, c–m^3	6	7	6·7	6·7	7	8	8
Teeth, c–m_3		7·6	7·1	7·3	7·6	8·8	9
Teeth, mandibular row, entire	7	8	7·6	7·8	8	9·3	

Thomas has less developed crests than his subspecies. Greatest length of skull 18·6–19·2, intermediate between *luzonus* (17·6)) and *plicatus colonicus* (21 mm.). Teeth, c–m^3 (6·7–7), also definitely intermediate between *luzonus* (6) and *colonicus* (7·7–8).

Measurements.—For detailed measurements of typical and paratypical series, and allied forms, see table on page 208.

Specimens examined.—Holotype male No. M.3606, allotype M.3645, and a series of more than 200 paratypes.

Collected and presented by N. S. Heffernan Esq., late Deputy Commissioner for the Western Pacific Government.

Range.—Ysabel Island in the Solomons. Collected in a cave at Mufu Point, six miles west of Tuarugu Village, south-west coast of Ysabel.

Remarks.—The following notes were supplied by the donor: "Called at Mufu Point and climbed up to caves and obtained a sackfull of bats. All of one kind, and there does not appear to be any other. Proportion of males to females, 1–6. Attempted photo of the swarm at sunset, estimated to be a mile in length and 50 yards broad before dispersing, but too dark and the film a blank. It is interesting to note that Mufu Point caves have absolutely only the one kind of bat, whereas a cave only a few miles distant has five varieties and probably more, but the situations are entirely different. Mufu Caves open out onto sheer cliffs over the water. The other cave is right on top of a hill in dense forest, and about 600 feet above sea-level."

Regarding generic characters, it is fortunate that Oldfield Thomas (*Journ. Bombay Nat. Hist. Soc.*, xxii, 1, 1913, pp. 89-91) provided features other than the closed premaxillae to differentiate *Chaerephon* and its allies since, as he remarked, "all sorts of intergradations are found in the premaxillae" so that it is often almost impossible to decide the generic identity of an individual by this character. My own experience, in clearing nine crania, was that a slip of the prosectorial knife, even under binoculars, could readily remove the frail traces of the junction, and the palatal branches isolating the two minute foramina.

In his description of *plicatus colonicus*, Thomas stated that examples of *plicatus* from New Guinea and Fiji corresponded in size with Javan and Indian specimens. As the life-size drawing of Buchanan-Hamilton's type of the true *plicatus* makes the forearm 48·5 mm., and Dobson records 49·5 for the forearm of an adult male, there seems no doubt that the longer forearm distinguishes it from *solomonis*. The colour is also evidently much brighter than in the true *plicatus*, described as "above bluish or smoke-black, beneath somewhat paler" by Dobson. It has already been shown that the size of the forearm, skull, and teeth, and, to a somewhat lesser extent, the colour and character of the fur, clearly differentiate *solomonis* from the Australian form of *plicatus*.