I. LIST OF *MICROCHIROPTERA*, OTHER THAN LEAF-NOSE BATS, IN THE COLLECTION OF THE FEDERATED MALAY STATES MUSEUMS.

By OLDFIELD THOMAS, *F.R.S.*

I owe to the kindness of Mr. H. C. Robinson the opportunity of examining certain of the bats preserved in the collection of the F.M.S. Museums, and at his suggestion I have written the following list. It contains the Microchiroptera other than the Leaf-nose bats, with which latter Dr. Andersen is dealing. By the generosity of the authorities of the F.M.S. Museums the British Museum has been permitted to retain a number of the specimens here enumerated, including the types of the three new forms described.

Eptesicus dimissus, sp. nov.

Eptesicus pachyotis, Robinson & Kloss, Journ. Fed. Malay States Mus. V. p. 116 (1914).

Type. ♀ in al. Kao Nawng, Bandon, Malay Peninsula 3,500′. June 1913. F.M.S. Mus. No. 529/13. Collected by H. C. Robinson and E. Seimund.

A medium-sized species related to *E. pachyotis*. Size rather greater than in *E. pachyotis*. Body proportionally rather larger compared with the wings. Fur short (hairs of back about 3 mm. in length), rather sparse, mostly confined to the body except on the interfemoral, on a triangle at the base of the tail. Colour chestnut brown above, lighter below, the hairs of the mesial area of the undersurface broadly tipped with dull whitish or buffy. Ears short, rather narrow, inner base with a rounded basal lobe; inner edge slightly convex, tip rounded off, outer edge straight above, convex lower down, with a low antitragal lobe. Tragus short, its inner margin, which is scarcely longer than its breadth, slightly concave, tip rounded, outer margin convex with a fleshy basal lobe. Wings to the middle of the metatarsals. A distinct post-calcarial lobule.

Skull broad and stoutly built, with a well marked occipital "helmet." Upper incisors with less disparity in size than in the allied species, the tip of the outer attaining three fourths the height of the inner, the latter rather small but still of the characteristic *Eptesicus* shape, parallel sided, bicuspid terminally; the outer tricuspid, obliquely concave. Last lower molar with its posterior portion nearly equal to the anterior part in area, and similar to it, as in most of the smaller species of the genus.

Dimensions of the type, measured on the spirit specimen.

Forearm, 42 mm.

Head and body, 57; tail, 39; ear, 14; tragus, length on inner edge 3, width 2–3. Third finger (epiphyses not fully ossified), metacarpus 39; first phalanx, 15; lower leg and hind foot with claw, 25.5 mm.

Skull, greatest length, 17.4; condyle to front of canine 15.8; basi-sinual length, 12.4; palato-sinual length, 6.3; front of canine to back of m^3, 6.2 mm.

Habitat and Type, as above.

This bat has been determined as *E. pachyotis*, Dobs. of Assam, to which it is no doubt closely allied. But it may be distinguished by its larger size (the type being barely adult), the attachment of the wing membrane to the middle of the metatarsus instead of to the base of the toes, and by its proportionally much larger outer upper incisor.

Nyctalus stenopterus, Dobs.

Nyctalus stenopterus, Thomas & Wroughton, Journ. F.M.S. Mus. IV. p. 110 (1909).

♀ in al. Krian Road, Larut, Perak.

7 „ Singapore.

Pipistrellus tenuis, Temm. (?)

Kirivoula tenuis, Cantor Journ. Asiat. Soc. Bengal XV, p. 185, 1846.

♀ Telok Bahang, Penang.

All the pigmy pipistrels of this region are very rare in collections, and it is impossible at present to make out their relations to each other, or even to identify with certainty the original *P. tenuis*.

Glischropus tylopus, Dobs.

Vesperugo tylopus, Bonhote, P. Z S., 1900, p. 876.

♂ Krian Road, Larut, Perak.

Hesperoptenus blanfordi, Dobs.

Hesperoptenus blanfordi, Robinson & Kloss, Journ. F.M.S. Mus. V. p. 116 (1914).

Vesperugo blanfordi, Anderson Cat. Mamm. Ind. Mus., I, p. 133 (1881).

2 skins. Semangko Pass, Selangor—Pahang Boundary. 2,700 ft.

♂ in al. Gunong Tampin, Negri Sembilan. (Malacca boundary).

♀ in al. Telok Bahang, Penang.

♀ „ Kuala Lumpur, Selangor.

♂ „ Kao Nawng, Bandon, Peninsular Siam.

A rare bat, not hitherto received at the British Museum. These specimens quite agree with Dobson's description of the type from Tenasserim. A rather strongly marked naked pad or wart just under the *symphysis menti* is not mentioned by the describer, but is present in all the specimens.

Scotophilus castaneus, Horsf.

Scotophilus temminckii, Cantor, Journ. Asiat. Soc. Bengal, xv, p. 185 (1846).

Nycteceius kuhlii, Flower, P. Z. S. 1900, p. 346.

Scotophilus castaneus, Bonhote, P. Z. S. 1900, p. 142; id. Fasciculi Malayensis, Zool. Pt. 1, p. 17 (1903); Thomas and Wroughton, Journ. F. M. S. Mus. IV, p. 110 (1900).

4 sk. and 5 in al.				Telok Bahang, Penang.
1	,,	1	,,	Lenggong, Perak.
		1	,,	Kuala Lumpur, Selangor.
2	,,	2	,,	Changi, Singapore.
6	,,			Tanjong Surat, Johore.

Myotis peytoni federatus, subsp. nov.

Type. ♀ skin. Semangko Pass, Selangor—Pahang Boundary. 2,700 ft., 25 Feb. 1908. S. M. 938/11. Original number 617.

Similar in general characters to typical *M. peytoni*, Wrought. & Ryley,* of Kanara, but the forearm, metacarpals and hind legs shorter.

Colour uniform dark brown, darker than in true *peytoni*, the tips of the hairs with scarcely any of the lighter wash evident in every specimen of *peytoni*.

Dimensions of the type, the italicized measurements taken in the flesh:—

Forearm 39.5 (45 in *peytoni*).

Head and body, 53; *tail*, 35; *ear*, 15. Third finger, metacarpus 36 (42 in *peytoni*) first phalanx 15.7 (16). Lower leg and hindfoot with claw 23.3 (28).

Skull, greatest length 16.5; basi-sinual length 12.6; front of canine to back of m^3 6.5.

Habitat and Type, as above.

This fine *Myotis* is so essentially similar to the S. Indian *M. peytoni*, the skulls being practically indistinguishable, that I only consider it as representing a local subspecies, in spite of the marked difference in the length of the limb-bones. Curiously enough, while the metacarpus is so much shorter than in true *peytoni*, the first phalanx of the third finger is of about the same length in the new forms.

* Journ. Bombay Nat. Soc XXII, p. 13 (1913).

Myotis muricola, Hodgs.

Myotis muricola, Miller, Proc. Acad. Nat. Sci. Philadelphia, 1898, p. 321; Bonhote, P. Z. S. 1900, p. 876; id. Fasciculi Malayensis, Zool. Pt. 1, p. 18 (1903); Robinson and Kloss, Journ. F. M. S. Mus. V, p. 116 (1914).

Vespertilio muricola, Flower, P. Z. S. 1900, p. 347.

2 in al. Kuala Lumpur, Selangor.

♂ Kao Nawng, Bandon.

♀ Batu Caves, Selangor.

Leuconoe hasselti, Temm.

Myotis adversus? Thomas and Wroughton, Journ. F. M. S. Mus. IV, p. 110 (1909).

2 ♀ Lekop, Karimon Id. Rhio Archipelago. (1,578, 80). The middle lower premolar quite as in typical *hasselti*.

Leuconoe horsfieldi, Temm.

♂ in al. Jugra, Selangor.

♀ ,, Selangor.

♀ ,, Batu Burong, Pahang.

Kerivoula papillosa, Temm.

♂. ♀. Semangko Pass, Selangor.—Pahang Boundary, 2,700 ft.

A rare species. The British Museum contains examples from Cambodia (Mouhot) and Borneo (Everett). The specimens recorded from Calcutta (Pearson), now prove to be distinguishable and have been recently described as *K. lenis*, Thos.

Kerivoula hardwickei, Gray.

♀ Semangko Pass, Selangor.—Pahang Boundary.

Miniopterus medius, Thos. and Wrought.

2 skins and 12 in al. Pulau Kaban, E. Coast of Johore.

♂ in al. Terutau Id, West Coast, Malay Peninsula.

These specimens agree closely in size and coloration with the middle of the three species of *Miniopterus* collected in Java by G. C. Shortridge during the Balston Expedition.

Emballonura monticola, Temm.

Emballonura peninsularis, Miller, Proc. Acad. Nat. Sci. Philadelphia, 1898, p, 323; id. Proc. Biol. Soc. Washington, XIII, p. 193 (1900); Bonhote, Fasciculi Malayenses, Zool. 1. p. 18 (1903); Kloss, Journ. F. M. S. Mus. 11, p. 155 (1908); Thomas and Wroughton, Journ. F. M. S. Mus. IV, p. 110 (1909); Robinson and Kloss, Journ. F. M. S. Mus. V, p. 115 (1914).

Emballonura anambensis. Kloss, Journ. F. M. S. Mus. IV, p. 186 (1911).

25 in al. from various localities, including Aor and Tioman Is. Skins from Kao Nawng, Bandon (2); Bliah, Pulau Kundur (2); Pulau Tioman (1); and Kuala Lumpur (1).

Taphozous melanopogon fretensis, subsp. nov.

Taphozous melanopogon, Cantor, Journ. Asiat. Soc. Bengal, 1846 p. 180; Flower P. Z. S., 1900 p. 347.

5 skins and 9 in al. Terutau Id. Straits of Malacca.
11 ,, 14 ,, Pulau Angsa, Coast of Selangor.
12 ,, Batu Caves, Selangor.

Essential characters as in true *melanopogon*, but colour both of fur and membranes far paler.

General colour above pale brown, near "avellaneous" of Ridgway, varying a good deal in intensity, the hairs white for the greater part of their length, avellaneous terminally, or with their extreme tips again light. Undersurface "drab grey," the black beard when present contrasting markedly with the general light colour of the underside. In some specimens the brown parts of the upper hairs may be considerably darker, but never or very rarely as dark as in ordinary *melanopogon*, the average colour of all Peninsular and Straits specimens being conspicuously lighter. Membranes pale brown throughout.

Dimensions of type:—Forearm 60 mm.

Head and body (measured in flesh) 80; tail 25, ear 17. Skull, greatest length 21; condyle to front of canines 20, front of canine to back of m^3 9.

Habitat. Islands and coast of the Straits of Malacca. Type from Pulau Terutau.

Type. Adult male. F. M. S. Mus. No. 391/12. Original number 5,163. Collected 1st December, 1912 by native collector.

The light colour of the fine series of this bat is in striking contrast to its dark hues elsewhere. A large number of specimens are in the British Museum from other parts of the range of *T. melanopogon*; but none show the peculiar pallor of the present set. The Terutau specimens average on the whole the lightest, then those from Pulau Angsa, and the Batu Caves, Selangor. Other peninsular examples, of which there are few available, appear to average rather darker than in the extreme of *fretensis*, lighter than in true *melanopogon*.

Taphozous leucopleurus albipinnis, Phos.

Taphozous longimanus albipinnis, Thomas, Ann. and Mag. Nat. Hist. Ser. 7, II, p. 246 (1898). Thomas & Wroughton, Journ. F.M.S. Mus. IV, p. 110 (1909).

Taphozous logimanus, Bonh. Fascic. Mal. Zool. 1, p. 18 (1903).

♂ Taiping. S. M. 1,054.

As noted in my recent paper on *Taphozous*,* the peninsular representation of the *longimanus* group agrees best with the Bornean *T. l. albipinnis*, Thos.

CHIROMELES TORQUATUS, Horsf.

Chiromeles torquatus, Flower, P.Z.S., 1900, p. 350; Thomas and Wroughton, Journ. F.M.S. Mus. IV, p. 110 (1909).

2 in al. Terutau Id.

5 sk. Juara Bay, Pulau Tioman.

♀ Krian Rd., Larut, Perak. 923/11.

* Journ Bombay Nat Hist. Soc. XXIV, p. 60 (1915).

II. A NOTE ON THE VARIATION OF A LOCAL RACE OF *EPIMYS RATTUS*. *EPIMYS RATTUS JARAK* (BONHOTE) FROM PULAU JARAK, STRAITS OF MALACCA.

By H. C. ROBINSON, *C.M.Z.S.*

In an earlier number of this journal (vol. 1, pp. 70, 71 (1905), Mr. J. L. Bonhote described this rat on a single specimen obtained by me in December, 1904.

The author regarded it as a race of the Sumatran *E. muelleri* (Jentink), but the acquisition of large series of closely allied forms both from the mainland and from various groups of islands show that it is rather to be regarded as a form of the cosmopolitan *E. rattus*.

In view of the fact that Pulau Jarak is very isolated and is practically never landed on, inasmuch as it possesses no beach and is steep to right up to the masses of granite boulders that form the shore, it is probable that the local rat population is hardly, if ever, contaminated by the introduction, whether by man or by natural agencies, of fresh blood. The race has therefore, in all probability, had time to attain a position of more or less stable equilibrium and I have therefore compiled the following tables based on a very considerable series obtained during two or three days in April, 1915.

The specimens were collected by two natives and were measured by them, but I have not thought it advisable to submit their figures to analysis as the personal error is probably large and variable and in so constant a race almost certainly masks the individual variation. It is, moreover, difficult to tell from skins whether the tails are really perfect, while the foot-measure, even for experienced European collectors, is subject to a personal or individual error, which is relatively considerable.

The measurements on the skulls have all been taken by myself with fine pointed dividers on a metal scale, the tenths of millimetres being estimated and in this connection it is well to consider the errors inherent to the methods of measurement, as they have considerable bearing on modern work in mammalology, local races being often founded on small differences in measurements based on series which from a biometrical point of view are frequently small.

Masking errors may therefore be introduced from the following causes:—

(1) A skull which has been comparatively recently cleaned, or which has been overboiled in the process of cleaning, will always give slightly larger measurements due to opening of the sutures; in the case of badly overboiled skulls this increase is permanent.

(2) There is probably a small error due to blacklash or spring in the dividers; this error is positive and is relatively greater in the smaller than in the larger measurements.

(3) In the case of the measurement of total length old skulls may give a longer measurement than that really representing their morphological size due to the development of post-occipital ridges. The length is also increased at the anterior extremity in very old specimens owing to occasional ossification of the cartilage at the tips of the nasals.

In the case of the measurement of the length of the nasals an element of uncertainty is often introduced by the irregularity of the suture with the frontal. This error may be either positive or negative.

In the Zygomatic breadth, a negative (i.e. the measurement obtained is too small) error is introduced by the spring of the zygomatic arches.

The Diastema is affected by the position of the roots of the anterior premolars which spread forward to a variable degree. This error also is negative.

The tooth-row measurement, which is taken on the alveolus, is affected in the same way, though the error in this case is positive (i.e. the result is too large); and also in old skulls by actual absorption of the teeth when the sign is negative. This is not very marked in most rats but the genus *Rhinosciurus (Sciuridae)* may be cited as an extreme case.

The specimens which have been measured, have been selected as adult, those specimens which show no signs whatever of wear on the molars having been rejected.

The arithmetic mean error, the error of mean square or Standard Deviation of Pearson have been calculated as also the Coefficient of Variation. It will be noted that the measurements in all cases, if plotted, form curves of a symmetrical type, the arithmetic mean agreeing very closely with the Median.

In the case of the upper tooth-row I have not given the standard deviation or the arithmetic mean error as the measurement does not admit of sufficient accuracy to give consistent results, the actual dimensions being very small and the normal variation being apparently contained within very narrow limits.

Table I. Measurements of *Epimys rattus jarak* (Bonhote)

Adult males.

Table II. Do.

Adult females.

Table III. Measurements of skulls of *Epimys rattus jarak* (Bonhote)
Total length = 100
Adult males.

Table IV. Do.
Adult females.

Table V. Skull Measurements of *Epimys rattus jarak* (Bonhote)

	column.
Arithmetic Mean	3
Median	4
Arithmetic Mean Error ..	5
Standard Deviation ...	6
Coefficient of Deviation ..	7

Abbreviations used in Tables.

M = much.
V = very.
Ml = moderately.
Sl = slightly.

TABLE I.

Measurements of **Epimys rattus jarak** (Bonhote), in Millimetres.

Adult Males.

Body.				Skull.							
Head and Body.	Tail.	Hindfoot.	Ear.	Total Length.	Condylo-basilar length.	Diastema.	Zygomatic Breadth.	Length of Nasals.	Upper molar series.	Condition of teeth.	F. M. S. No.
175	165	31	20	..	35.0	11.0	19.5	15.0	6.3	M worn	[illegible]
165	175	34	20	42.0	[illegible]	12.1	20.0	16.0	6.2	..	[illegible]
165	173	30	20	42.0	36.2	11.9	19.1	15.2	6.7	..	[illegible]
170	162	[illegible]	21	41.8	36.7	12.2	20.8	15.9	[illegible]	..	[illegible]
178	172	32	20	[illegible]	[illegible]	[illegible]	20.1 (app.)	15.7	[illegible]	..	[illegible]
[illegible]	175	[illegible]	[illegible]	41.2	[illegible]	[illegible]	19.9	[illegible]	[illegible]	Sl. ..	[illegible]
[illegible]	[illegible]	[illegible]	20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Sl	[illegible]
[illegible]	[illegible]	32	21	[illegible]	[illegible]	[illegible]	19.7	[illegible]	[illegible]	Sl ..	173/15
165	[illegible]	31	[illegible]	[illegible]	[illegible]	12.1	[illegible]	[illegible]	[illegible]	..	[illegible]
[illegible]	[illegible]	32	21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Sl ..	[illegible]
[illegible]	183	[illegible]	21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	..	214/15
167	159	32	21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Sl ..	[illegible]
[illegible]	158	31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	..	[illegible]
163	[illegible]	31	20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6.3	Sl ..	[illegible]
166	163	[illegible]	20	40.7	[illegible]	[illegible]	19.9	[illegible]	6.5	Sl. ..	[illegible]
165	[illegible]	33	[illegible]	40.6	[illegible]	[illegible]	19.4	[illegible]	6.3	..	156/15
174	182	31	19	40.3	[illegible]	12.0	19.0	15.1	6.2	..	[illegible]
176	[illegible]	32	20	40.3	[illegible]	[illegible]	19.2	15.1	6.1	Sl ..	127/15
161	176	35	19	40.2	36.0	11.7	19.4 (a)	14.9	6.2	..	90/15
178	175	32	21	40.2	35.3	11.4	19.9	15.0	6.2	..	188/15
168	163	31	21	40.2	35.4	[illegible]	18.2	15.1	6.0	..	200/15
180	165	32	21	40.2	35.2	11.1	19.3	15.0	6.0	..	206/15
175	..	31	20	40.2	36.2	11.7	19.3	14.7	6.1	V ..	210/15
168	[152]	33	19	40.1	35.2	11.3	19.2	15.0	6.1	..	154/15
183	..	..	21	40.1	36.7	12.0	19.9	14.3	6.2	Sl. ..	184/15
160	..	34	20	40.1	36.0	11.3	19.2	14.6	6.1	..	98/15
154	184	31	19	40.1	35.7	11.3	19.0	14.3	6.2	V. sl. ..	97/15
162	185	33	20	40.0	35.8	11.7	19.8	14.9	6.1	M ..	89/15

TABLE I—*Continued.*

MEASUREMENT OF **Epimys rattus jarak** (BONHOTE), IN MILLIMETRES.

Adult Males.

Body				Skull.						Condition of teeth.	F M S No
Head and Body	Tail.	Hindfoot.	Ear	Total Length.	Condylo-basilar length.	Diastema	Zygomatic Breadth	Length of Nasals.	Upper molar series		
158	186	32	19	40·0	36·6	11·	19·7	14·8	6·0	V sl. worn	96/15
172	184	32	21	40·0	36·4	11·0	19·2	15·0	6·2	M ,,	104/15
165	182	32	21	40·0	35·8	12.1	19·8	15·	6·0	Sl ,,	278/15
175	162	31	20	40·0	35·0	11·2	19·2	14·7	6·1	,, ,,	143/15
16·	175	30	20	40·0	35·1	11·3	19·6	14·6	6·2	,, ,,	129/15
173	178	31	20	40·0	35·6	11·7	19·2	15·0	6·0	,, ,,	273/15
168	175	31	20	40·0	35·3	11·4	19·2	15·0	6·2	Sl ,,	215/15
180	193	32	..	39·9	35·2	11·2	19·7	14·9	6·2	Not ,,	122/15
165	..	32	20	39·8	35·8	1 1·7	..	15·0	6·1	,, ,,	157/15
183	162	31	20	39·8	35·0	11·1	19·4	14·7	6·1	V. ,,	267/15
172	178	30	20	39·8	35·9	11·3	19·1	14·5	6·3	Not ,,	125/15
185	103	32	21	39·6	35·7	11·2	19·0	14·6	6·3	Ml ,,	209/15
165	160	30	20	39·5	35·0	11·2	19·4	14·5	6·1	,, ,,	279/15
175	168	32	21	39·3	35·0	11·2	19·0	14·4	6·1	,, ,,	203/15
155	183	32	19	39·3	35·3	11·2	18·8	14·7	6·1	Sl ,,	95/15
168	..	31	20	39·2	34·8	11·1	18·5	15·0	6·2	,, ,,	274/15
165	154	30	20	39·2	35·1	11·2	19·5	14·4	6·3	,, ,,	272/15
180	183	32	21	39·2	35·2	11·2	19·1	14·4	6·2	Not ,,	277/15
173	180	32	21	39·2	35·8	11·4	19·2	14·8	6·3	,, ,,	184/15
159	185	32	19	39·2	35·2	11·9	18·4	14·6	6·0	Sl. ,,	104/15
165	159	29	20	39·2	34·0	10·7	19·0	14·1	6·1	Not ,,	136/15
187	189	32	21	39·1	35·1	12.0	18·9	14·3	6·3	Ml. ,,	232/15
168	178	30	20	39·1	35·0	11·5	19·3	14·3	6·1	,, ,,	121/15
160	184	31	21	39·0	35·0	11·2	18·9	14·8	6·1	Not ,,	170/15
152	162	31	19	39·0	34·8	11·2	18·1	14·9	5·9	V. ,,	108/15
173	..	31	20	39·0	35·0	10·9	19·2	14·0	6·1	,, ,,	182/15
168	154	31	20	38·9	34·1	11·0	18·3	14·8	5·9	Sl ,,	212/15
158	180	29	20	38·9	35·0	11·2	19·1	14·4	6·1	M. ,,	103/15

TABLE II.

MEASUREMENTS OF **Epimys rattus jarak** (BONHOTE), IN MILLIMETRES.

Adult Females.

Body.				Skull							
Head and Body.	Tail.	Hindfoot.	Ear.	Total Length.	Condylo-Basilar Length.	Diastema	Zygomatic Breadth	Length of Nasals	Upper Molar Series	Condition of Teeth.	F.M.S No
185	198	33	22	43.0	37.1	12.0	19.8	15.7	6.0	Worn	250/15
170	198	32	21	42.3	37.1	11 9	19.4	15 6	6.3	,,	120/15
170	[165]	30	19	41.6	36.8	12 4	20.0	15.4	6.3	M ,,	131/15
165	185	31	19	41.2	36.1	12.0	20 1	15.1	6.4	,,	130/15
175	173	31	20	41.1	36.9	12.0	20.3	15.2	6.4	,,	275/15
179	185	32	21	40.9	36.4	12 0	20.0	15.1	6.1	Sl. ,,	249/15
160	192	33	21	40.8	30.0	12.0	19.3	15.2	6.2	Sl. ,,	158/15
168	180	30	20	40.8	36.3	11 9	19.7	15.1	6.1	,,	251/15
170	178	31	20	40.8	36 1	11 6	19 9	14.9	6.2	V ,,	270/15
165	185	34	19	40.2	36 0	11 5	20.3	14.9	6.1	,,	86/15
162	..	31	19	40.2	35.9	11.3	19.9	14.6	6.1	,,	91/15
175	190	31	20	40 2	36.1	12.0	20 3 (app.)	15.0	6.1	V ,,	124/15
162	..	31	20	40.2	36.0	11 9	19.2	14.8	6 1	M ,,	246/15
171	..	31	20	40.1	35.0	10 9	19.7	14.0	6.1	M. ,,	280/15
170	158	30	20	40.1	35 7	11 2	19 6	14.9	6.3	,,	247/15
166	155	31	20	40.0	35 8	12.0	19.1	14.0	5.9	V. ,,	168/15
175	183	32	21	40 0	35.2	11.1	19.8	14.2	6 2	,,	245/15
168	..	31	20	40 0	35.2	11.2	19.6	13 9	6.1	V ,,	284/15
152	168	30	18	39.9	35.1	11 4	20.0	14.4	6.1	,,	87/15
165	155	30	20	39 9	36.2	12.1	20.2	15.0	6.1	,,	259/15
175	170	30	20	39.9	35.0	11 2	19.3	14.2	6.1	Not ,,	253/15
165	183	30	19	39.9	36.0	11.8	20 0	14.9	6.2	Not ,,	106/15

TABLE II—*Continued.*

MEASUREMENTS OF **Epimys rattus jarak** (BONHOTE), IN MILLIMETRES.

Adult Females.

BODY.				SKULL							
Head and Body.	Tail.	Hindfoot.	Ear	Total Length.	Condylo-basilar Length.	Diastema.	Zygomatic Breadth	Length of Nasals	Upper Molar Series	Condition of Teeth.	F M S No
165	180	31	20	39·8	35·0	11.1	19.4	14·7	6.1	Sl. worn	207/15
174	168	30	20	39·8 (app.)	36.0	12.0	19.5	15 1 (app.)	6.1	M. ,,	260/15
168	156	32	20	39 7	35.0	11 6	19 5	14.4	6.1	M. ,,	201/15
165	160	31	21	39.5	35.3	11.7	20.0 (app.)	13·9	6.2	V. ,,	255/15
179	175	32	21	39.4	35.1	10.9	19.8	14.8	6.0	Sl. ,,	163/15
176	182	32	..	39.2	35 0	11.6	19.4	14 2	6.1	M. ,,	181/15
174	169	32	21	39 2	35.2	11.0	20 0	14.9	6.3	M. ,,	164/15
166	185	30	20	39.1	35.0	11 0	19 0	14.0	6.2	V. sl ,,	189/15
160	..	31	20	39 1	35 6	11.4	19.2	14.5	6 0	,,	254/15
167	173	31	20	39.1	35.0	11 3	19.4	15.0	6 0	Mi. ,,	216/15
173	..	30	20	39.1	35.2	11.7	9 6	14.4	6.0	M ,,	211/15
158	..	30	20	39.0 (app.)	34.9	11.9	19.0	14.2 (app.)	5.9	,,	282/15
155	154	30	20	39.0	34.1	11.1	20.0	14.8	6.1	M. ,,	171/15
155	175	29	19	38.9	35.0	10 9	19.8	14.1	6 0	Sl. ,,	88/15
175	188	31	20	38 9	35.0	10 9	..	14.1	6.1	V. sl. ,,	258/15
155	169	30	19	38.9	34.1	11.0	18.8	14.1	6.2	Sl ,,	119/15
167	170	30	20	38 3	34.1	11.0	18.8	14 2	6.2	Not ,,	215/15
160	172	30	20	38.1	33.9	11.2	18.2	14 1	6.1	Sl. ,,	248/15

TABLE III.

Measurements of Skulls of adult males of **Epimys rattus jarak** (Bonhote).

Total Length = 100.

Condylo-basilar Length.	Diastema.	Zygomatic Breath.	Length of Nasals.	Upper Molar Series.	Condition of Teeth.	F.M.S. No.
—	—	—	—	—	V. worn	161/15
89.0	28.8	47.6	38.2	14.8	,,	94/15
86.2	28.3	45.5	36.2	16.0	,,	134/15
87.7	29.2	49.8	38.0	14.8	,,	205/15
89.1	29.0	48.7	36.6	14.5	V. ,,	132/15
87.4	28.6	48.3	36.3	16.0	Moderatelly ,,	135/15
88.5	28.8	46.8	36.6	15.4	Sl. ,,	93/15
88.3	28.8	48.0	37.1	15.1	M. ,,	173/15
88.3	29.5	48.6	36.5	14.9	,,	167/15
89.8	28.8	47.4	37.3	15.4	Sl. ,,	56/15
89.9	29.8	48.9	37.2	15.4	,,	211/15
88.3	27.4	46.9	36.9	14.9	Sl. ,,	221/15
88.5	28.8	46.8	36.8	14.9	,,	179/15
88.2	28.7	47.0	36.8	15.4	Sl ,,	105/15
90.9	28.9	48.9	37.1	15.9	,, ,,	102/15
80.0	28.0	47.7	36.8	15.5	,,	156/15
89.4	29.8	47.1	37.5	15.4	,,	128/15
89.4	29.5	47.6	34.9	15.1	Sl. ,,	127/15
89.6	29.1	48.3	37.0	15.4	,,	90/15
87.8	28.3	49.4	37.4	15.1	,,	188/15
88.0	28.8	45.4	37.7	14.8	,,	200/15
87.8	27.6	47.9	37.3	14.8	,,	206/15
90.0	29.1	48.1	36.6	15.2	V ,,	210/15
87.8	28.2	47.7	37.4	15.2	,,	154/15
91.5	29.9	49.5	35.6	15.4	Sl. ,,	184/15
89.8	28.2	47.9	36.4	15.2	,,	98/15
89.0	28.2	47.4	35.7	15.5	V. sl. ,,	97/15
89.5	29.3	49.5	37.3	15.3	M ,,	89/15

TABLE III—*Continued.*

MEASUREMENTS OF SKULLS OF ADULT MALES OF **Epimys rattus jarak** (BONHOTE).

TOTAL LENGTH = 100.

Condylo-basilar Length.	Diastema.	Zygomatic.	Length of Nasals.	Upper Molar Series.	Condition of Teeth.	F.M.S. No.
89	27.8	49.3	37	15	V. sl. worn	96/15
91	29.8	48	37.5	15.5	M. ,,	104/15
89.4	30.3	49.4	37.5	15.0	,,	278/15
87.5	28.5	48.0	36.8	15.2	Sl ,,	143/15
88.0	28.3	49.0	36 5	15.5	,,	129/15
89.0	29.2	48 0	37 5	15.0	,,	273/15
88.3	28 5	48.0	37.5	15.4	Sl. ,,	213/15
88.2	28.0	49.4	37.3	15 3	Not ,,	122/15
90.0	29.3		37.7	15.4	W. ,,	157/15
89.4	28 1	48.7	36.9	15.3	V. ,,	202/15
90.2	28.4	47.9	36.4	15.8	Not ,,	123/15
89.9	28.2	47.7	36.9	15.8	Ml. ,,	209/15
88.7	28.4	49.0	36.8	12.2	,,	279/15
89 0	28.5	48.3	36.6	15.5	,,	203/15
89.8	28.5	47.8	37.4	15.5	Sl ,,	95/15
88.7	28 3	47.2	38.2	15.8	,,	274/15
89.5	28.5	49.5	36.7	16 1	,,	272/15
89.8	28.6	48.6	36 7	15.8	Not ,,	277/15
91.3	29.0	48.9	37.8	16.0	,,	183/15
89.8	30.4	46.9	37.2	15.3	Sl. ,,	101/15
86 7	27.3	48.5	35 9	15.6	Not ,,	136/15
89 9	30.7	47.2	36.6	16.1	Ml ,,	222/15
89.5	29 4	49.4	36.6	15.6	,,	121/15
89.7	28.7	48.5	37.9	15.6	Not ,,	170/15
89.2	28.7	46.4	38.2	15.1	V. ,,	108/15
89.7	27.9	49.3	36.0	15 6	,,	182/15
87.7	28.4	47.2	38.2	15.1	Sl. ,,	212/15

TABLE IV.

MEASUREMENTS OF SKULLS OF ADULT FEMALES OF **Epimys rattus jarak** (BONHOTE).

TOTAL LENGTH = 100.

Condylo-basilar Length.	Diastema.	Zygomatic Breadth.	Length of Nasals.	Upper Molar Series.	Condition of Teeth	F. M. S. No.
86.3	27.9	46 0	36.5	15.3	Worn	250/15
87.7	28.1	45.8	36 9	14.9	,,	120/15
88.5	29.8	48.0	37 0	15.1	,,	131/15
87.6	29.1	48.8	36.7	15.5	,,	130/15
89.8	29.2	49 4	36.9	15.6	,,	257/15
88.9	29 3	48.9	36.9	14.9	Sl. ,,	249/15
88.2	29 4	47.3	37 3	15 2	Sl. ,,	158/15
88.9	29 1	48 3	37 0	14 9	,,	251/15
88.5	28.4	48 8	36.5	15 2	V ,,	270/15
89.6	28 6	50 5	37.0	15 2	,,	86/15
89 3	28 1	49.5	36.3	15.2	,,	91/15
89.8	29.9	50 5	39.8	15 2	V ,,	121/15
89.6	29.6	47.8	36.8	15.2	M. ,,	216/15
87 3	27.2	49.1	34.9	15.2	M ,,	280/15
89 0	27.9	48 9	37.2	15.-	,,	247/15
89.5	30.	47.8	35.	14 8	V ,,	168/15
88.	27 8	49.5	35.5	15.5	,,	245/15
88.	28.	49	34 8	15 3	V ,,	284/15
87 9	28 6	50.1	36.0	15.3	,,	87/15
90.7	30.3	50.6	37 6	15.3	,,	259/15
87.7	28.0	48.4	35 6	15.3	Not ,,	253/15
90.2	29.6	50.1	37.3	15.5	Not ,,	106/15
87.9	27.9	48.7	36.9	15.3	Sl. ,,	207/15
90.5	30.2	48.9	37.9	15.3	M. ,,	260/15

TABLE IV—*Continued.*

MEASUREMENTS OF SKULLS OF ADULT FEMALES OF **Epimys rattus jarak** (BONHOTE).

TOTAL LENGTH = 100.

Condylo-basilar Length.	Diastema	Zygomatic Breadth.	Length of Nasals.	Upper Molar Series.	Condition of Teeth.	F M S No
88.2	29.3	49.3	36.3	15.3	M. worn	201/15
89.4	29.6	50.6	35.2	15.7	V ,,	255/15
89.0	27.7	50.3	37.6	15.2	Sl ,,	163/15
89.3	29.6	49.5	36.2	15.6	M. ,,	181/15
89.3	28.0	51.0	38.0	16.0	M. ,,	164/15
89.5	28.1	48.0	35.8	15.8	V. sl. ,,	189/15
91.0	29.2	49.1	37.0	15.3	,,	254/15
89.5	28.9	49.6	38.4	15.3	Ml. ,,	216/15
90.0	29.9	50.1	36.8	15.3	M. ,,	211/15
89.5	27.9	48.7	36.4	15.1	,,	282/15
87.4	28.5	51.3	37.9	15.6	M ,,	171/15
89.9	28.0	50.9	36.2	15.4	Sl ,,	88/15
89.9	28.0	—	36.2	15.7	V. sl. ,,	258/15
87.7	28.3	48.3	36.2	15.9	Sl. ,,	119/15
89.0	28.7	49.0	37.0	16.2	Not ,,	215/15
88.9	29.4	47.8	37.0	16.0	Sl. ,,	248/15

TABLE V.

	Sex.	No. of observations.	Arithmetic Mean.	Median	Arithmetic Mean error.	Standard Deviation.	Coefficient of Variation.
			m.m		m.m.	m.m.	
Total length	♂	55	40.08	40.0	63	77	.019
Total length	♀	40	39 93	39.9	738	1.00	025
Condylo-basilar length ..	♂	56	36. 0	35.8	596	758	021
Condylo-basilar length ..	♀	40	35.5	35.4	668	792	022
Diastema	♂	56	11. 5	11.5	304	374	032
Diastema	♀	40	11. 5	11.5	392	453	039
Zygomatic breadth	♂	55	19. 3	19.2	365	491	.025
Zygomatic breadth	♀	40	19. 0	19.7	377	467	024
Length of Nasals	♂	56	14. 9	14.9	300	404	027
Length of Nasals	♀	40	14 65	14.7	435	492	033

III. ON AN ABERRATION OF *SCIURUS PREVOSTI PREVOSTI* FROM SOUTH WESTERN PAHANG.

By HERBERT C. ROBINSON, *C.M.Z.S.*

Three races of the handsome Raffles squirrel are recognizable in the Malay Peninsula, two very distinct, and the third somewhat indefinite both in range and characters. These are

Sciurus prevostii prevostii, Desm.

Desm. *Mamm.* p. 335 (1822).

Range. The Southern portion of the Malay Peninsula not north of a line drawn from the northern border of the territory of Malacca to Kuala Kurau on the Pahang River.

This form is at once distinguishable by having the white side stripe continuous from ankle to ear over the shoulder.

Sciurus prevostii wrayi, Kloss.

Kloss, Journ. Fed. Malay States Mus. iv, p. 148 (1911).

Range. From the Siamese Malay State of Trang, through the districts of Selama and Temengoh in northern Perak and across the main range of the Peninsula to the headwaters of the Pahang and Tahan Rivers. Range northwards on the east side of the Peninsula not yet determined.

This form is separable from the other two by having a wash of ochraceous fulvous on the shoulder, thereby breaking the continuity of the white lateral stripe. In the next race this wash is almost as deep in colour as the feet.

Sciurus prevostii humei, Bonhote.

Bonhote, Ann. and Mag. Nat. Hist. (7) vii, p. 170 (1901).

Range. Central and Southern Perak to the south of Selangor.

In this form the ochraceous chestnut of the shoulder is broadly in contact with the black of the back.

Of the *first* race, *Sc. p. prevostii*, the Federated Malay States Museums, possess a series of skins from Nyalas, Malacca, which are practically topotypes of the species and call for no special remark. They have the hands and feet chestnut, the extremities of the fingers and toes sometimes rather paler, tending to orange buff, while in one case the feet near the ankle are clad with speckled black and grey hairs mingled with the chestnut, though this colouring is not symmetrical.

Two skins from Ayer Kring, Negri Sembilan, on the eastern watershed of the Peninsula (Nos. 239, 240/12) are typical, but a third has the speckled markings on the feet well developed, while there is a tendency to the same change on the hands. (No. 241/12).

But of seven skins from Triang, about 20 miles north from Ayer Kring, three, Nos. 475, 477, 480/12 are typical, though the feet are somewhat paler chestnut, while the others show marked variations.

One No. 479/12 has the hands and feet almost entirely white, the colour of the hands soiled with chestnut and the feet with a narrow ring of chestnut near the ankle. The bases of the hairs throughout black.

Another, No. 478/12 has the hands dull chestnut, intermixed with many black and silvery white hairs and the feet silvery, dark maroon towards the ankle. The point of the shoulder blackish and the shoulder above much sprinkled with blackish hairs so that the white lateral stripe appears partially interrupted. No. 476/12 is more nearly normal but has the feet decidedly paler chestnut and the feet dirty whitish on the distal phalanges, chestnut on the proximal. No. 481/12 differs in the greater extension of white down the forearm towards the fingers, which are orange, and in the paler tint of the feet, which are clad with buffy golden hairs towards their extremities.

These variations all occurring in specimens from one locality and which are not correlated apparently either with the age of the individual or with that of the pelage, which is fairly fresh and uniform in the whole series, appears to indicate a state of unstable equilibrium in the species, parallel to but on a smaller and less striking scale than that described by Messrs. Thomas & Wroughton in the Chindwin squirrels of the superspecies, *Callisciurus sladeni* Journ. Bomb. Nat. Hist. Soc. Bombay.

The facts are interesting and worthy of note and though I do not think that the creation of yet another subspecies is justified with existing material it may be permissible to borrow a method of nomenclature from the entomologists, and record the form as an aberration.*

Sciurus prevostii, subsp. prevostii.

ab. **meticulosus,** aberrat. loc. nov.

Type of the Aberration. Adult female (skin and skull). F.M.S. Museums No. 479/12, collected on 9th September, 1912 by Museum Collector, at Triang, South-western Pahang.

Characters. Similar to *Sc. prevostii prevostii,* but having the white side stripe practically continuous from the tips of the fingers to the tips of the toes.

* Rothschild, Hartert and Jordan, Nov. Zool I. p. 1. (1894); iid. op. cit. II. p. 180, para 2. (1895).

Measurements (taken in flesh by native collectors) Head and body, 255; tail, 235; hindfoot, 52; ear, 22 mm.

Skull: Total length, 57.0; condylo-basilar length, 49.2; palatilar length, 23.9; diastema, 14.0; upper molar series including $pm.^3$ 10.5; interorbital breadth, 22.4; cranial breadth, 24.8; zygomatic breadth, 35.1; median length of nasals, 19.1. mm.

Should this aberration, as will not improbably prove to be the case, be found to occur in a definite area to the exclusion of the normal form, it will, of course, have to be classed as a subspecies.

I. H. N. Evans, Photo.

Sakai of the Kampar River above Gopeng, Perak.

IV. NOTES ON THE SAKAI OF THE ULU KAMPAR. (Plates I—V).

By Ivor H. N. Evans, *B.A., Assistant Curator and Ethnographical Assistant, F.M.S. Museums.*

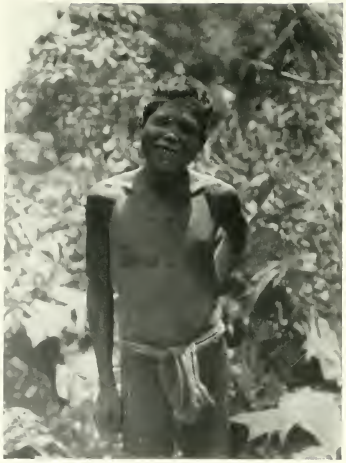
The following notes are the results of rather over a month's work among the Sakai of the Kampar River, above Gopeng, in the Kinta district of Perak; my visit to these people having been made during the months of May and June, 1915. Starting from Gopeng on May 20th, a three miles walk, chiefly through old and new tin workings, took me to "Kampong Ulu Pipe," a Malay settlement, about three miles distant from Gopeng, which is close to Messrs. Osborne & Chappel's new pipe-line. On the hills near this village can be seen several Sakai clearings, so, with the idea of getting into touch with their inhabitants and of learning something of the aborigines living round the headwaters of the Kinta River, I made a few days stay in this locality. With regard to my second intention, I met with very small success. The Malays of the settlement are all foreigners, Sumatra men, who have come into the country within the last twenty years or so, and know practically nothing of the district with the exception of their own village and the road to Gopeng. I could not even obtain from them the name of a conspicuous mountain, which was clearly to be seen from the village. The information I got from the local Sakai was almost as unsatisfactory as that from the Malays, since they also seemed to move only within a small radius in the region of the foot-hills. The country of the Pahang border was to them unexplored territory, and they seemed to have no intercourse with the aborigines of that district. These tame Sakai inhabit the Kinta Valley from about Gopeng to localities some little way above the dam on the big pipe-line, and also those of the Guroh and Geruntum (Kuntun on the map) Rivers, tributaries of the Kinta, while they have some intercourse with the people of Sungei Raia, who are said to differ slightly from them in dialect. This particular section of the Sakai, which cannot well be called a tribe, falls within the large division of the Central Sakai. The aborigines who live near Gopeng have adopted Malay fashions in dress, and the blow-pipe seems to be falling into disuse among them, as do also their ancient customs and beliefs.

Finding these people, therefore, too sophisticated to be likely to afford me much of interest, I moved to a Sakai settlement on the Kinta River, some two and a half miles above the dam on the large pipe-line, and some ten miles from Gopeng. Here I stayed for about a fortnight. Though the inhabitants of this settlement had been to a considerable

extent in contact with Malays and Chinese, they were much less civilized than the Sakai living closer to Gopeng. Si Busu the headman of the settlement, which consisted only of one small house, gave me a good deal of interesting information about customs and beliefs, and I also had with me a Sumatran Malay named Dana; he had a Sakai wife who told me a good deal about aboriginal affairs, though I did not accept his statements before verifying them by questioning the Sakai themselves.

Si Busu's settlement consisted of a rather small house, roofed and walled with palm leaves, which stood in a considerable clearing planted with tapioca. Access to the dwelling was gained by a bamboo ladder. The doorway could be closed with a sliding door of sheet bamboo, and on the left of this there was built out a small room, occupied by an old man; this had a window to the outside and another and a door opening into the house. A single large room occupied the rest of the space below, but above this, built out towards the back of the house and supported on high poles, was an upper room which was entered from below by means of a bamboo ladder. The cooking place, with its earthen floor, was built rather to one side of the large room and over it was a framework with shelves for storing firewood, cooking utensils, etc. The dart quivers belonging to the men of the house were hung against the uprights supporting the shelves. One or two store-bins for padi, made of tree-bark, were placed near the walls, while a space in one corner of the room, walled in to a height of about two and a half feet with tree-bark, but empty at the time of my visit, had also been used for holding padi grain. I spent a good deal of time in the house and was interested to notice that, unless asleep, the Sakai were never without occupation of some sort. Their appetites were insatiable, and shortly after a hearty meal of rice, gourd, and frogs or some other such delicacy, they would start roasting Indian corn or tapioca in the ashes of the fire. The consumption of Indian corn and tapioca, if the Sakai were at home, went on intermittently all day long. Apart from eating, the men occupied themselves in making stocks of blow-pipe darts and snares for small game, or in repairing their casting nets; the women devoted themselves to the manufacture of mats and carrying baskets or the cutting and drying of tobacco, previously rolled leaves of the plant being shredded with a sharp sliver of bamboo on a billet of wood. This was placed on the slant, one end resting on the floor, the other against a wall of the house.

The clearing in which the house was situated had been planted in the previous year, the Sakai's custom being first to sow a new clearing with rice and then to plant tapioca, a much slower growing crop, among the rice. Thus, after the rice harvest is over, and most of the crop consumed, they are able to fall back on their tapioca, which by that time is sufficiently far advanced to be dug up.



I. H. N. Evans, Photo.

Sakai of the Kampar River above Gopeng, Perak.

It is not necessary to say anything about the blow-pipes or the dart-quivers generally in use among the Kampar Sakai, as they are of the same type as those of the aborigines of the Batang Padang District of Perak, which have been fully described by Skeat and others. One quiver, however, which was hanging from the posts supporting the shelves above the cooking place, immediately attracted my attention, since its cover was of quite a different type from the normal, being a hard and stiff cap of plaited rattan 17.5 cms. high. After a considerable amount of fruitless questioning I elicited the information that it had been bought from a Kinta River Sakai, and this of course explained its resemblance to the quivers used by the aborigines of the Kuala Kangsar and Upper Perak Districts.

Customs, Religious Beliefs and Superstitions.

I gathered from the Sakai living on the clearings around "Kampong Ulu Pipe" that they have some hazy idea of a Supreme Being or Deity (the sun), whom they call *Yenong*. This statement is supported by the information which Wilkinson obtained from one of the same people, whom he induced to live in Taiping for about three months. As among the Sakai of Sungkai and the Hill Sakai of the Temengoh District of Upper Perak, the shaman or magician is termed *Halak* and the familiar spirit, by whose aid he works his spells, his *Anak Yang*. It is said that formerly the body of a dead *Halak* was left unburied in the house where he died. I was also told that the Halak's *bumbun*, or round hut, is built within a dwelling house, and consists of seven *bertam* palm-leaves plaited together and fastened to form a circle within a rectangular frame of wood, which is attached to the posts of the shelves over the fire-place and to some of the posts of the house.

The rest of the information under this heading is derived from Si Busu and the people of his house.

First, I will give some account of various superstitions and tabus which influence the people's daily life. As among so many aboriginal tribes, lightning (chilou) and thunder are held in dread. The following actions are thought to cause thunder storms, and are therefore tabu.

(1) To roast an egg in the fire.

(2) To laugh if a snake is met with in the jungle.

(3) To pull a jungle-leech off the body and burn it.

When a bad thunder storm comes on, the Sakai descend down from the house to the ground, strike their parangs into the earth and leave them there. Hot stones from the hearth, the supports for cooking pots, are also thrown out of the door of the house. Both these actions are thought to be helpful in dispersing the storm; and the hot stones, symbolically at any rate, dry up the rain.

Should anyone in the house, a child at play for instance, break off the tail of a lizard, each person cuts a piece of hair from his, or her, head, burns it in the fire, and then, after collecting the ashes, blows them through the hands, placed trumpet fashion before the mouth, saying: "Usah, usah gelebeh" (don't any more). If this were not done, the house would be struck by lightning.

We will next take some beliefs and customs connected chiefly with sickness.

If three men have planned to go on a journey or to fell jungle together, but one man remains at home without saying anything (i.e. excusing himself from going), and should one of the two companions fall sick, his illness is at once ascribed to the man who stopped behind. The two will immediately return, and the third man must say charms for the recovery of the patient. If, however, the man who stops at home makes some excuse for not going, no ill fortune encountered by his companions can be ascribed to him.

If a man throws away the end of a cigarette or some scraps of food, and what he throws away falls into a hole in a tree-stump, a mortar for pounding padi, the stump of a bamboo, or any place which holds, or can hold, water, and should he afterwards fall ill with pains in his stomach, he thinks that this action is the cause. He will, therefore, go to the place where he threw away the food fragments and remove them. If he did not do this, he would not recover from his illness.

If a man is sleeping in the jungle on the ground (or sometimes if he is living in his house), and falls sick with itchy feelings in his body or swellings, he will dig up the ground under his sleeping place, and if he finds an ants' nest will destroy it. The ants, so he thinks, have caused him to fall sick, and the destruction of the nest insures his recovery.

If a man who has been camping in the jungle falls sick, and should remember that he has left a pole of one of the shelters he has used standing in the ground, he will return and pull it up, otherwise he will not recover.

If a man sits down on a spot where the roots of two trees interlace he will fall sick: for places of this kind are the abodes of spirits.

If a man leans against a tree which has a creeper twining about it, he will become ill: for this tree is the dwelling place of a spirit. The sick man will, however, recover if he returns and cuts through the creeper.

Tabus with regard to mothers-in-law and fathers-in-law are in force. A man must avoid his mother-in-law as much as possible, and a woman her father-in-law.

Some very interesting information with regard to customs, now obsolete or nearly so, came to light during my conversations with Si Busu. He told me that he had seen

SAKAI OF THE KAMPAR RIVER ABOVE GOPENG, PERAK.

I. H. N. Evans, Photo.

these observances practised while still a youth. In choosing a site for a new clearing, a kind of divination was practised to see whether the Earth Spirit would allow the ground to be used. When a suitable piece of ground had been chosen, the Sakai went to the site proposed for the new clearing and repeated some spells. They then swept all rubbish from a small plot of ground, and enclosed it within a frame made of four pieces of wood each about a foot and a half long. The pieces of wood were called *galang dapor*. Incense was burnt within the square, and, if much smoke arose from it, this was regarded as a sign that the padi crop would be plentiful. Next, little cups made of *lebak* leaves containing incense, water, lebak leaves and rice-flour were placed within the square. The man who performed the ceremony then covered the square over with leaves and everybody went home. If this man dreamed on that night that the place was not good another site was chosen for the clearing. Dreams about fire or of a piece of wood wrapped in a mat (i.e. a body ready for burial) were bad. Providing that the celebrant's dreams were favourable, the Sakai went the next morning to the clearing site and uncovered the square of ground which they had swept. If the ground under the covering of leaves was undisturbed, they looked upon this as a sign that they might make the proposed clearing, but if they found any adventitious substances under the leaves, such as rubbish of any kind, or twigs and scraps of wood, another site had to be chosen and the performance repeated. If some rubbish had merely fallen on the leaves covering the square, the clearing might be made, though this was regarded as a sign that somebody from another settlement would die in their house. If, however, a clearing were to be made after rubbish had been found under the covering leaves, it was thought that this would result in the death of a man of the house.

When the young padi has sprung up no bamboos or rattans must be cut near the clearing until the crop is ripe.

The season for sowing padi is when the *petai* fruits are ripe and the *durian* and *prah* nearly so.

Another curious Sakai superstition is that the earth must not be struck with a stick, this action being thought to irritate the Earth Spirit.

Tabu signs are hung up across the approaches to the clearing and outside the houses on the first day of padi sowing to warn the people from other settlements that they may not enter, but the tabu period is only for one day.

In making a clearing the first step is to cut away the undergrowth. This work proceeds for three days, and then a one day's stop is made. When the undergrowth has all been cleared the felling of the big trees begins, and here again after working for three days the Sakai rest for a day.

During the first three days of clearing undergrowth it is tabu to touch the chopping knife of a man who is engaged in

the work. Similarly during the first three days of felling the big trees nobody may touch an adze belonging to another man.

At the time of the reaping of the padi crop the settlement is laid under certain tabus for a period of six days. During this period cigarettes may not be smoked nor blow-pipes and fish be brought into the houses. Tabu signs of palm leaves are hung up as a warning to outsiders not to visit the clearing. On the first day of reaping seven ears of padi, the rice-soul, are tied up, and incense burnt to them. These seven ears are left till reaping is finished, and round them sufficient padi to fill two or three reaping baskets, this being the rice-soul's companion. The rice-soul is finally reaped, and incense is burnt under the place where it is hung up for six days. After this the grain from the rice-soul and its companion are taken and mixed with the seed padi.

Si Busu also gave me a little information with regard to customs connected with child-birth. It appears that after a birth the navel cord is buried under the house. Should the child fall ill and its body appear swollen, the cord is dug up and inspected to see whether white or other ants are eating it. Should this be the case, the ants are killed with hot water and the cord is re-buried in another spot. If no ants are found, the cord is again interred in the same place.

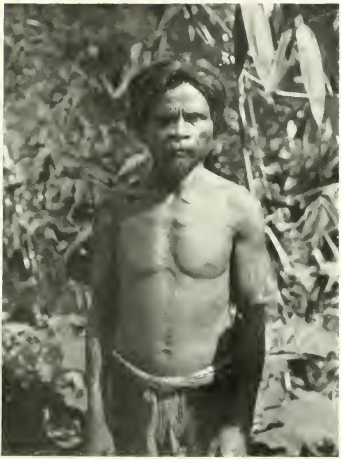
After a woman has been delivered, spells are said over her, and when this has been done, she is allowed to eat every kind of food with the exception of chilies, which are forbidden to her for six days.

I was told that articles of property, not necessarily belonging to the deceased, and food are placed on a newly made grave, and that a fire is kindled, morning and evening, at the spot for the first six days after burial.

Contact with Malays and Chinese has tended to destroy the customs and beliefs of the Sakai living within easy reach of the settlements of these races. Consequently the Sakai around "Kampong Ulu Pipe" seem to have lost most of their distinctive customs, and the same is true in a less degree of those living above the dam. I gathered that some of the customs described above are obsolete or obsolescent among the people that I visited, though they probably remain in full force among the wilder aborigines in the headwaters of the Kampar River.

ABORIGINES OF THE PAHANG BOUNDARY.

Apart from the fact that aborigines of the foot-hills have little intercourse with the people of the main range and are therefore ignorant of the whereabouts of their settlements, my visit to the Kampar district was very ill-timed with regard to getting coolies for an expedition to the mountains, since the Sakai were engaged in making clearings for planting their padi. Repeated questionings of the Malays and Sakai gained me but little information about the people of the mountains, though



I. H. N. Evans, Photo

Mountain Sakai, Ulu Kampar, Perak.

I chanced to hear reports of communal houses. Si Busu knew almost as little as the other Sakai from whom I made enquiries, but I arranged with him that he should go up country and try to bring down some wild people to see me. He left his house on May 5th, and calling in at a relation's clearing, a little further up the Kampar River, took this man with him, since he (Si Busu's relation) occasionally had dealings with the hill Sakai. On the afternoon of May 8th Si Busu and his relation returned, bringing with them twelve wild Sakai, three men, two boys, and seven women. All of them seemed very much frightened, the women keeping their eyes fixed on the ground, and the men being obviously extremely nervous. None of these people spoke Malay, though I believe that one of the men understood a few words of that language. On the day of their arrival I took a few photographs and some measurements of the men, and in the evening I got Si Busu to bring two of them to my tent. One kept his face averted the whole time and the other spoke in whispers when answering questions. I took a vocabulary (printed with this paper), of rather more than thirty words, but I did not attempt to carry the matter further owing to the Sakai's uneasiness. Judging from the words obtained, however, their dialect belongs to the central Sakai groups, as does that of the more civilized aborigines of the Kampar River. I did my best to find out from Si Busu where these people lived, what mountains their clearings were on, and what was the nearest river, but without much success, but probably they were from the Perak side of the main range. The next morning I was told that the women-folk being, I supposed, frightened, had departed at daylight. This was particularly annoying as some of them had tatu marks on the face, which I wanted to sketch. The men left at about 10 a.m. on the same day. I afterwards found out that Si Busu had got them down on false pretences, asking them, I believe, to help him in making his clearing. This, no doubt, partly accounted for their nervousness, since, when they found that I had called them, and that they had been told a lie, they probably thought that they were to be kidnapped. I reproached Si Busu for having told the Sakai an untruth, but he said that if they had known that a European wanted to see them they would have refused to come and would most likely have deserted their clearing. The only other information that I was able to gain about these people, partly from Si Busu, partly from themselves with Si Busu's assistance, was that their houses were small, but had several fire-places, and that one family occupied each house. Each household appears to possess two clearings, one planted with quick-growing crops such as *Sengkuai* (millet), Indian corn and gourds, the other with slow-growing vegetables such as tapioca, *keledek* (convovulus batanas?) and caladium. When the quick-growing crops are exhausted they subsist on the produce of their second planting. I gathered that the Hill-Sakai only moved within a very small radius since they

said that they did not know the aborigines of the Kinta, Raia, Telom or any other rivers. They had never heard of the bow, nor did they know anything about the working of iron; so it would seem that they are not in touch with the Northern Sakai.

With regard to the tatu patterns mentioned above, except in one case where I have made a note that a man had a line tatued from the top of the forehead to the tip of the nose—only one man was tatued—I have to rely on my memory, owing to the Sakai women taking their departure as I have already related but, as far as I can recollect, the womens' patterns were very similar to those affected by the hill Sakai *men* of the Ulu Temengoh, i.e., three pairs of parallel lines running slantingly across each cheek and some V shaped markings on the forehead.

English.	*Malay.*	*Sakai.*
Head	Kepala	Jelbal.
Ear	Telinga	Entak.
Eye	Mata	Mat.
Nose	Hidong	Moh.
Cheek	Pipi	Ming.
Mouth	Mulut	Nynum.
Lips	Bibir	Nynum (?)
Tongue	Lidah	Lentag.
Tooth	Gigi	Lemoin.
Chin	Dagu	Lingkah.
Neck	Leher	Tangun.
Nape of neck	Tengkok	Tangkok.
Shoulder	Bahu	Gelpol.
Arm	Lengan	Kengris.
Elbow	Siku	Kanang.
Hand	Tangan	Tok.
Thumb	Ibu tangan	Jaras (?) tok.
Finger	Jari	Jaras tok.
Nail	Kuku	Chendros.
Thigh	Paha	Lempar.
Knee	Lutut	Kurul.
Shin-bone	Tulang kering	Jong kemaun.
Foot	Kaki	Juk.
Heel	Tumit	Chanong juk.
Sole of foot	Tapak kaki	Tapar juk.
Toes	Jari kaki	Jaras juk.
Breast	Dada	Entok.
Back	Belakang	Kenok.
Liver	Hati	Gris.
Stomach	Prut	Ek.
Navel	Pusat	Suk.
Intestines	Isi perut	Chong ek.
Blood	Darah	Behip.
Bone	Tulang	Je-ark.
Skin	Kulit	Getug.
Hair	Rambut	Sok.

V. NOTE ON A COLLECTION OF ROCK SPECIMENS FROM PULAU PISANG, WEST COAST OF JOHORE.

By J. B. Scrivenor, Geologist, *F.M.S.*

In May 1916 Mr. C. Boden Kloss sent me a collection of rock specimens from the small island, Pulau Pisang, off the southern part of the west coast of Johore. Mr. Kloss stated that only two of the specimens represent rock that he saw exposed *in situ* and that the remainder came from a shingle beach. All the specimens are from the north side of the island.

These specimens are of sufficient interest to warrant a note on them and their relations to other rocks in the Malay Peninsula. On glancing over the collection one had the impression that they were largely rocks of the "Chert Series" indurated by metamorphism, and thin sections prepared for the microscope support this view, while a pebble of granite in the collection shows how the metamorphism was effected, but on the other hand they show that volcanic ashes are also represented on the island. The following is a brief description of the rocks.

1. *Granite.* This pebble is too small to say what type of granite it was derived from. The slide contains only one mica, biotite, but a larger specimen might very likely show muscovite as well. There is nothing unusual about the rock.

2. *Quartz-mica-syenite-porphyry.* Nothing exactly corresponding to this rock has been found before in the Peninsula and it is unfortunate that it is only represented by a pebble. Hornblende is common and there is an equal quantity of altered biotite also in fairly large flakes. There are numerous porphyritic crystals of felspar full of finely divided decomposition products. Some of them appear to be kaolinized orthoclase but others show traces of polysthenic twinning. The felspar crystals are generally bordered by a very delicate growth which in some cases looks like a radial arrangement of minute fibres of felspar, but with a high power much of it is resolved into a micropegmatitic intergrowth of quartz and felspar. Quartz is confined to this intergrowth and to the base, which does not form a large proportion of the rock and is of felspar and quartz in small grains. The quartz is a minor constituent, and the rock is a porphyry of same composition as quartz-mica-syenite. The nearest approach to this rock known as yet in the Peninsula are certain syenitic rocks found in the Benom Range of Pahang (*vide* "The Geology and

Mining Industries of Ulu Pahang," p. 59, 60) which are believed to be of the same age as the granite of that range and possibly to owe their distinct composition to a mixture of a basic magma with that of the granite. Some of these rocks, however, contain pyroxene. There is none in the Pulau Pisang pebble nor is there any reason to believe that the hornblende is derived from pyroxene, and a rock of this nature might consolidate at a shallow depth from a part of a hornblende-granite magma poor in quartz. There is a quantity of white opaque matter showing a trace of crystal outline which is probably a decomposed titaniferous mineral.

3. This is a dark pebble, shown by the thin section to be altered volcanic ash rich in quartz and with orthoclase and soda-plagioclase as felspars. Alteration is proved by the hard compact nature of the rock and the presence of a secondary mineral, in minute grains. It may be zoisite.

4. Another altered ash similar to 3. The secondary mineral is probably epidote.

5. A finer grained ash, full of a granular mineral, probably secondary epidote.

6. A rock with much secondary epidote which obscures its original nature. It may have been sandstone.

7. A pale grey pebble of very fine but hard texture. It is impossible to say anything with certainty about its mineral composition even after examination under a 1/12" oil immersion objective. It is probably altered shale with minute granules of epidote.

8. A pebble closely resembling black chert of the Chert Series, the resemblance being confirmed by the section. The secondary minerals are epidote, some forming minute veins, and a very finely fibrous mineral of which nothing definite can be said but which is probably an amphibole. There is no trace of radiolaria.

9. A banded pebble showing black and grey rock. Both are very fine grained but the black rock is certainly altered chert, while the grey is either shale or fine ash.

10. This is one of the two specimens mentioned by Mr. Kloss and is like No. 7. It shows stratification. Thin sections of the rock point to it being fine shale full of granular epidote.

11. The other specimen mentioned by Mr. Kloss consists of alternating bands of black and grey rock, the latter having a slight buff tint. The grey bands resemble 7 and 10 and may be either altered shale or fine ash. The black bands are altered chert and fine black shale. The secondary minerals they contain are epidote, the fibrous mineral seen in No. 8, which, in one slide, has a distinct greenish tint, and brown mica.

There can be no doubt that these rocks are from a junction of Chert Series rocks and granite and there are two points concerning them that are worth attention. The first of these is the association of volcanic ash.

The coarser specimens cannot be distinguished from some of the ashes of the Pahang Volcanic Series, and this is the third instance in which these volcanic rocks have been found associated with chert. Another instance is at Lubok Plang, on the Pahang River, where a bed of chert was found between a flow of lava and a layer of ash. Epidote occurs in the chert and in the volcanic rocks but in the Pulau Pisang chert it is more abundant. Radiolaria are more abundant in the Lubok Plang chert.

The second known instance of the association of volcanic ash and chert was afforded by specimens taken from a stone-heap in Singapore. The radiolaria in the chert are in some cases at any rate preserved as casts of chlorite and the same mineral occurs in the ash. Nothing definite could be learned about the locality whence these rocks came. One statement was to the effect that they might have come as ballast from Mauritius, but that is very unlikely, and in view of the nature of the Pulau Pisang rocks, they may have come from a neighbouring island.*

Generally the radiolarian cherts are found close to thick beds of quartzite and shale, and in the coarser quartzites pebbles of chert are abundant. Lately Mr. E. S. Willbourn has reported chert and quartzite to be interbedded in certain sections in Negri Sembilan. These three cases of association with igneous rocks suggest that in some cases their origin may be the same as that put forward in the Geological Magazine for 1911 (British Pillow Lavas and the rocks associated with them—loc. cit. pp. 202-209 and 241-248) by Messrs. Dewey and Flett, who think that silicate of soda from volcanic eruptions was dissolved in sea-water and created conditions favourable for siliceous protozoa such as radiolaria. As the eruptions that formed the Pahang Volcanic series were in part submarine, this may be a case of similar conditions and similar results.

The other point of interest is the resemblance of the pale grey rock (Nos. 7 & 10) to some of the boulders and pebbles found in Kinta with the boulders of tourmaline-corundum rock. These are light coloured, sometimes oolitic, and sometimes contain a little corundum and tourmaline. In a description† of the tourmaline-corundum rocks it was suggested that certain bodies in them may be replacements of casts of radiolaria, and a rock was found in Kinta actually showing

* A fourth occurrence of chert associated with an igneus rock is known on the Ginteng Sempah Road, Selangor.

† Quart. Journ. Geol. Soc. lxvi 1910, pp. 435-449.

radiolaria. The resemblance then, of the Pulau Pisang grey, fine-grained rock, to the light-coloured rocks forming part of "tourmaline-corundum rocks" and its association with chert, is further evidence for the tourmaline-corundum rocks being in part altered Chert Series rocks.

But, assuming this to be correct, there is a great difference between the alteration by granite on Pulau Pisang and by granite in Kinta. In the former case the very fine grain makes determination of constituent minerals difficult, but epidote, fibrous amphibole, and brown mica seem to be the result of metamorphism, while in the latter the alteration produced large quantities of tourmaline and corundum, with rutile, spinel, white mica, and fluorite.

VI. A NOTE ON CALLOSCIURUS FINLAYSONI (*HORSF.*) AND ALLIED FORMS.

By Herbert C. Robinson, *C.M.Z.S.*

In recent articles on *Sciurus finlaysoni* in the "Journal of the Natural History Society of Siam"* Mr. C. B. Kloss has dealt with this species and its allied forms at considerable length and has erected for races inhabiting Koh Si Chang and Kok Phai, islands in the Gulf of Siam, close to the mouth of the Menam River, two new races, viz. *Sciurus finlaysoni portus*, inhabiting the former, and *Sc. f. folletti*, the latter, island.

After discussing the literature in some detail Mr. Kloss has, after consideration, decided that the name *Sc. finlaysoni*, sensu stricto, shall be retained for the form inhabiting the mainland.

He attempts to justify his contention by referring to the original description by Horsfield (*Zool. Res. Java*——, 1824) in which that author states that "this species has hitherto been mentioned by Buffon alone from the following concise notice in P. Tachard's travels"————while, in addition, Mr. Kloss also refers to Anderson, who states that "the type of *Sc. finlaysoni* was obtained in Siam by Dr. Finlayson and another was procured by the same traveller in Sichang Island. These two squirrels are exactly alike, being white squirrels with a yellowish tinge." The latter clause shows that Dr. Anderson did not study these two specimens in any great detail.

Further, Mr. Kloss quotes Horsfield (Cat. Mamm. E. Ind. Co. Mus., p. 154, 1851) as stating that the locality of the specimen in the Museum of the East India Company (transferred to the British Museum in 1879) was "Siam." This is, however, not strictly accurate. The habitat of the *species* is given as "Siam" while a *specimen* "A" is mentioned "from G. Finlayson's Collection during Crawford's Embassy to Siam and Hue," which is not quite the same thing.

The whole crux of the matter, however, is that the older authors paid no very particular attention, either to the exact localities of their specimens or to minute subspecific differences, and Koh Si Chang is certainly near enough to Siam to be quoted as such by Horsfield. The conception also, of a definite specimen as a type of a species when one or more were available is of very much later date than Horsfield in 1824 or for the matter of that than Dr. Anderson, writing in 1878.

We come, therefore, to the first detailed revision of the group on modern lines, that of Wroughton (Ann. & Mag. Nat. Hist. (8) ii, pp. 393 et seq., 1908). This paper has been

* Vol. i, pp. 157—162 (March 1915); op. cit. pp. 225—228 (December 1915); Vol. ii, pp. 16, 30 (June 1916).

quoted by Mr. Kloss but he has unfortunately omitted to note that therein the specimen from Koh Si Chang has been definitely selected as the type, as indeed had already been done by Bonhote in 1900. The dimensions given by Wroughton perfectly agree with those of the type of *Sc. f. portus*, Kloss, as is shown by the figures here repeated, those in parentheses being from the type of *Sc. f. portus*. Allowance must of course be made for the fact that the body measurements of the type of *Sc. finlaysoni* have presumably been taken on the dry skin.

Head and body, 175 (197); tail, 175 (183); hindfoot, 43 (44) mm. Skull: greatest length, 46 (46.5); interorbital breadth, 17.3 (16.7); zygomatic breadth, 28 (27.5); length of nasals, 13 (12.6) mm.

Under the rules governing nomenclature, as almost universally recognised by zoologists, the first reviser has the right to designate the type of a species from the original material, if such has not been done by the author of the species.

Sciurus finlaysoni portus therefore becomes a pure synonym of *Callosciurus finlaysoni finlaysoni* (Raffles).

The mainland animal being thus without a name I propose to dedicate it to the original discoverer.

Callosciurus finlaysoni tachardi, subsp. nov.

Diagnosis. Similar to the typical form from Koh Si Chang but considerably larger, greatest length of skull 53.5—57.0 mm. against 44.0—47.7 mm. in the typical form.

Type. Male adult (skin and skull) in British Museum from R. Mee Nan, Siam, altitude, 75 m. collected by Mr. T. H. Lyle on April 4th, 1900 (*spm.* f. sub. Sciurus finlaysoni, Bonhote, P.Z.S. (i) 1901, p. 53.)

Co-types. Krabin, Bangpakong R., Central Siam, collected by native collector in November, 1915. Nos. C BK. 2020, 2037—8, 2046—8). (cf. Kloss, Journ. Nat. Hist. Soc. Siam, ii, pp. 16, 30 (1916).

VII. THE NATURAL HISTORY OF KEDAH PEAK.

V. Botany.

By H. N. Ridley., M.A., C.M.G., F.R.S., F.L.S.

Late Director of Gardens, Straits Settlements.

[*A short account of the physiography of the mountain and a list of the Vertebrates obtained during the expedition has already been published in this journal* (*Vol. VI. pp. 219, 244*). *H.C.R.*]

The Mountain of Kedah Peak, Gunong Jerai of the Malays, has been visited by several botanists, the first of whom appears to have been Thomas Lobb, who collected a few plants there which are now in the Kew Herbarium; later, Sir Hugh Low ascended it, accompanied by the well known orchid collector, Boxall. In 1893 I visited it myself and brought down a fairly extensive collection of the plants there. Some account of this trip was published in the Journal of the Royal Asiatic Society Straits branch, vol. 34, p. 23. Mohamed Aniff, of the Penang Gardens, has also been there,* and now we have an excellent collection made by Messrs. H. C. Robinson and C. B. Kloss in December, 1915. The specimens were gathered at a height of from 2,800 to 4,000 feet, and to these are added a few collected at Gurun at the foot of the Peak.

Among these are especially noticeable the additions of two new genera to the flora and both of these species new to science, viz. *Myrioneuron* (*Rubiaceae*) an Indo-Malayan genus, and *Eulalia*, a fine grass allied to Indian species. There are a number of other interesting species in the collection, noticeably the beautiful Jasmine *J. Kedahense*. A tall, white-flowered Vaccinium *V. eburneum*, another handsome new *Xyris*†, besides the *X. Ridleyi* formerly obtained by me here, and the very rare *Acriopsis Ridleyi*, of which the only specimen previously known was a single plant found in a pepper garden in Singapore.

The flora of Kedah Peak bears a considerable resemblance to that of Mt. Ophir, especially in the occurrence of lowland seashore plants at this altitude, isolated as they are from the ordinary habitats of these plants by the forests which lie between them and the sea. This is perhaps most marked in Mt. Ophir, but the occurrence here of such plants as *Archytea Vahlii*, *Adinandra dumosa*, *Euthemis leucocarpa*, *Vaccinium Malaccense*, *Aneilema giganteum*, *Isachne rigida*, typically plants of open and usually sandy country distinctly suggest an original flora of a sandy, littoral character of which these

* Gardens Bulletin, Straits Settlements, I. No. 10, p. 353 (July 1916). [A small list of Monocotyledons collected by Mohamid Haniff shortly before our visit to the Hill.]

† The Xyridaceæ have unfortunately been omitted from Mr. Ridley's Manuscript but will be published in a subsequent number of this Journal.

littoral plants are the relics. There can be little doubt that Mt. Ophir was at one time an island detached from the mainland as Penang is to this day, and it seems highly probable that Kedah Peak may have been similarly isolated. The absence of any real Siamese element in the flora of Kedah Peak in spite of its practically over-looking the southern Siamese rice fields and heaths with their distinctive Siamese flora, has been noted by me previously, and this collection confirms it, although it includes the handsome *Bauhinia bracteata*, Grah., a plant of Siam which was obtained in the low country round Gurun. The flora of Kedah Peak is typically Malayan, and it is the most Northern Malayan mountain in the peninsula, unless the Gunong Perak range, quite unknown botanically as yet, should also contain a Malayan flora.

MAGNOLIACEÆ.

1. TALAUMA LONGIFOLIA, *sp. nov.*

Talauma mutabilis, var. *longifolia*, Bl. Anon. p. 37.

A shrub 10 to 12 feet tall. Leaves thinly coriaceous, glabrous, lanceolate, long acuminate and shortly narrowed to the base, nerves 7 pairs, slender, reticulations conspicuous, 6 to 8 inches long, 1·7 to 2·5 inches wide, petiole ·5 inch long. Peduncle 1-1·5 inch (in fruit) long, appressed, silky. Bud ellipsoid, beaked, appressed, silky. Petals glabrous, oblong, obtuse, cream or pale yellow, ·7 inch long, ·3 inch wide. Fruit glabrous, pustular 1·5 inch long, carpels about 6, beaked.

Kedah Peak at 3,900 feet alt. Flowers cream (no. 6040), small tree, flowers pale yellow, scented (no. 6110), also collected here by Mohamed Aniff, Moulmein (Lobb), Pungah (Curtis), Java. The narrower leaves and much smaller flower distinguish this from T. *mutabilis*, Bl.

1A. *Illicium Cambodianum*, Hance. At 3,900 feet (6002). Small tree, rosy cream flowers, at 3,000 feet (6089). Common in all mountain districts in the peninsula.

DILLENIACEÆ.

2. *Acrotrema costatum*, Jack. Flowers sulphur yellow, Gurun (6178), Kedah Peak (6067). Common in hill districts all over the peninsula.

ANONACEÆ.

3. *Goniothalamus subevenius*, King. Gurun (6174). *Distrib.* Perak.

POLYGALACEÆ.

4. *Polygala venenosa*, Juss. At 3,800 feet. Common in the hill districts 6035.

5. *Salomonia cantoniensis* var *gracilis*.

Stems slender, simple or little branched, slightly winged with small, nearly sessile ovate leaves above, longer petioled ones below. Fruit with short bristles along the edge.

This has the habit of *S. oblongifolia* but the leaves of *S. cantoniensis* reduced. This latter plant is usually a weed of cultivation and one would hardly expect to find it high upon Kedah Peak.

Flowers purplish at 3,000 feet. No. 6064.

TERNSTROEMIACEAE.

6. *Adinandra dumosa*, Jack. A variety with very rounded leaves at 3,000 feet. No. 5987. Common in the plains, but it also grows on Mount Ophir at 3,000 feet.

6A. *Eurya acuminata* var *glabra*, Bl. A form with rather larger flowers than the low country form. Small tree 15 to 20 feet, flowers whitish. Gurun No. 6172.

7. *Archytaea Vahlii*, Choisy. On dry ridges, yellowish white. No. 6083. Common in the low country and also on Mt. Ophir.

8. *Ternstroemia japonica*, Thunb. Trans. Linn. Soc. ii. 335.

Small shrub, leaves rather thinly coriaceous, lanceolate, long acuminate, subacute base gradually narrowed, nerves 5–6 pairs, rather conspicuous beneath for a *Ternstroemia*, 2–3·25 inches long, ·7 to 1 inch wide, petiole ·2 inches long. Calyx lobes ovate obtuse. Fruit globose ·3 inches long on a slender pedicel ·5 inches long. Seed ellipsoid ·25 inches long, red.

Kedah Peak. Small shrub, seeds brilliant scarlet. No. 6039.

This resembles plants from Khasiya, Siam and Java. The leaves are thinner and more acuminate than in other eastern species. The specimens are all in fruit.

GUTTIFERAE.

9. *Calophyllum Prainianum*, King? Kedah Peak No. 6039.

Only leaf specimens with reniform galls, but apparently this species.

10. *Garcinia eugenifolia*, Wall. At 3,000 feet. *Distrib.* Malaya.

STERCULIACEAE.

11. *Buettneria Jackiana*, Wall. Gurun No. 6169. Flowers whitish. Distrib. Penang.

12. *Leptonychia glabra*, Turcz. Gurun No. 6153. Shrub about 10 feet. Common all over the Peninsula.

GERANIACEAE.

13. *Impatiens Griffithii*, Hook. fil.

Kedah Peak 6007. Flowers rich, rose pink. Also collected there by Lobb and myself. It occurs too on Mt. Ophir.

OCHNACEÆ.

14. *Enthemis leucocarpa*, Jack. Kedah Peak at 3,000 feet from Padang upwards, No. 5967. Small shrub, flowers white, anthers pale yellow. This is usually a sea shore plant, but occurs also at the top of Mt. Ophir far from the sea as here.

15. *Gomphia Hookeri*, Planch. Tree about 20 feet tall. Flowers deep rose red at 3,000 feet. No 5989.

Also usually a sea coast plant.

ILICINEÆ.

16. *Ilex patens*, Ridl. var. *tenuifolia*.

Differs from the type in Gunong Tahan in its thinner, more polished leaves and more distinctly winged petiole. Petals 5 or 6.

Shrub, flowers white at 3,000 feet. No. 6105.

CELASTRINEÆ.

17. *Euonymus javanicus*, Bl. Padang to Sch. Small shrub. Capsule salmon pink. No. 5975.

Common all over our hill district.

LEGUMINOSÆ.

18. *Bauhinia bracteata*, Graham. Branches tomentose, reddish. Leaves glabrous, broadly ovate, bifid coriaceous, subcordate, lobes 2.5 inches long, nerves 10 nervules curved parallel, 3.5 m. long and as wide, petiole 2 inches. Panicle large 9 inches long, 7 inches across, branches tomentose. Pedicels 1·5–2 inches long, pubescent, with 2 linear bracts ·15 nches long midway. Buds ellipsoid narrowing to tip. Sepals 2, ovate oblong, persistent pubescent, ·3 inches long. Petals 5, claw slender pubescent ·6 inches long, blade cordate, rounded, greenish white, conspicuously dark veined, edge crisp, back silky hairy, face sparsely hairy, ·4 inches long and wide. Stamens 3, fertile ·5 inches long, filaments hairy, anthers short, oblong, sterile ones 6 glabrous ·4 inches long, filaments subulate gradually narrowed from base, anthers small, ovate. Pistil hairy at base.

Gurun. Flowers greenish white, very handsome. No. 6180. New to the Flora, a native of Siam.

RHIZOPHOREÆ.

19. *Anisophylleia trapezoidalis*, Baill. *A. disticha*, Baill. Gurun No. 6168. Shrub 7 to 8 feet.

Common in most parts of the peninsula.

20. *Pellacalyx saccardianus*, Scort. Gurun No. 6163. Small tree, flowers greenish.

Common in the low country.

HAMAMELIDEÆ.

21. *Rhodoleia Teysmanni*, Miq. At 3,000 feet. No. 5985. Small tree to 20 feet. Sepals yellowish, anthers rose pink.

On most of the mountain ranges of the peninsula.

MYRTACEÆ.

22. *Baeckea frutescens*, Linn. From 3,000 to 6,000 feet. No. 6071. Habit very variable.

On all the high ranges.

23. *Leptospermum flavescens*, Sm. At 3,000 feet. No. 6082. Usually with the last.

24. *Tristania Merguinsis*, Griff. At 3,800 feet. No. 6034.

24A. *Eugenia claviflora*, Roxb. At 2,500 feet. No. 6019. Tall shrub. Flowers white.

25. *Eugenia subdecussata*, Duthie. At 3,000 feet. No. 6080. In fruit. Common in hill ranges.

MELASTOMACEÆ.

26. *Sonerila erecta*, Jack. At 3,000 feet No. 6063. *Distrib.* Penang—Perak.

27. *Sonerila linearis*, Hook. fil. Padang'to Seh upwards Nos. 5957. Flowers deep pink, anthers yellowish, leaves beneath purplish.

First collected here by Lobb., but overlooked by King, as the locality, Gunong Jerai, was referred to Burmah by error.

Endemic.

28. *Sonerila calophylla*, Ridl. Flowers pink. Stem and leaves very succulent. No. 6068.

Endemic to Kedah Peak. First collected by me.

29. *Phyllagathis rotundifolia*, Bl. Gurun. No. 6166. Flowers crimson.

30. *Medinilla Maingayi*, Clark. Epiphytic on Hydnophytum. No. 6055.

Common in low country south of the Peninsula. Also on Mt. Ophir.

31. *Pternandra paniculata*, Benth. At 1,500 feet. No. 6148. Flowers whitish.

SAMYDACEÆ.

CASEARIA FLEXUOSA, *sp. nov.*

32. Branches flexuous with pale bark. Leaves glabrous, thinly coriaceous, lanceolate, narrowed at both ends, acuminate, acute, nerves 4 pairs, reticulations fine, distinct 3–3·5 inches long, 1–1·25 inches wide, petiole ·2. Capitula dense, flowers about 20, rachis finally developing short and thick. Bracts numerous, lanceolate, acute ciliate. Flowers glabrous ·1 inch

long, pedicels. Sepals oblong glabrous. Petals (inner pair) obovate orbicular, slightly broader, edge ciliate, stamens nearly as long as the sepals, glabrous, filaments thick, anthers broad obtuse. Staminodes as long as the stamens, oblong linear, villous at the tips, glabrous below. Pistil elongated conic, stigma capitate. Fruit ellipsoid ·75 inches long, apricot coloured.

Kedah Peak (Ridley 5218, 5364), (Robinson & Kloss 6025). Penang (Curtis 1019).

Begoniaceæ.

33. *Begonia sinuata*, Wall. Flowers white. (No. 6005). Occurs also in Penang.

34. Begonia sibthorpioides, *sp. nov.*

Rhizome tuberous ·2 inches long, oblong, covered with golden hairs, stems very slender, 2–4 inches long, red, glabrous. Leaves in distant pairs, orbicular, cordate, crenulate, glabrous, nerves from base 6, ·5 inches long and as wide, red beneath, petiole ·2–·8 inche long. Stipules hardly ·1 inch long, triangular lanceolate, ciliate. Male flowers 2–3 subterminal on slender erect branches 1 to 3. Bracts sheathing, lanceolate, acuminate. Sepals 2, oblong obtuse, narrowed towards the base. Petals 2, as long and wide, but subacute. All white. Anthers in a small globose head on a filament-pedicel as long. Fruit ·1 inch long with one large oblong rounded wing ·2 inches long, the other ones hardly developed. At 3,800 feet. No. 6047.

Flowers rose pink. Leaves red beneath. A very curious little plant with leaves like those of *Sibthorpia europea* in form.

Araliaceæ.

35. Arthrophyllum ovatum, *sp. nov.*

A woody shrub. Leaves opposite paired, ovate to elliptic, base cuneate, rather long and sharply acuminate, edge thickened, coriaceous, nerves 3 to 5 pairs, sunk above, elevate beneath, 3·5 inches long, 1·75 inches wide, petiole 1·25–2 inches long. Umbels 2·5 inches long of 15 rays each, jointed half way, where is a caducous pair of small leaves. Flowers in umbellules of about 20. Pedicels ·2 inches long. Buds subglobose, pointed. Calyx lobes short, rounded. Petals greenish yellow, triangular, lanceolate, acuminate ·1 inch across. Stamens shorter.

No. 5995. Woody shrub 10 feet high, flowers greenish yellow. Also on Gunong Semangkok in Selangor (Ridley 15617).

36. Arthrophyllum nitidum, *sp. nov.*

Small shrub. Leaves 12 inches long, pinnate, leaflets 9–15 coriaceous, oblong or elliptic lanceolate, base often oblique 2·5 to 3·25 inches long, 1 inch wide, petiolule ·25 to ·4

inches long, terminal leaflet ovate acuminate, narrowed to the base, 2·5 inches long, 1·75 inches wide, petiole ·75 inches long polished above nerves, inconspicuous above, visible beneath, fine 3 to 4 pairs. Umbels 11 to 12, of 18 to 20 flowers, peduncle 1–1·25 inches long, pedicels ·2, umbels subtended by 1 to 3 phyllous leaves longer than them. Buds obovoid, blunt, Calyx lobes distant, blunt, rounded, short. Petals oblong, obtuse subtriangular. Stamens as long.

Small shrub (No. 6093).

37. *Dendropanax Maingayi*, King. At 3,000 feet. No. 6104. Shrub, flowers greenish.

At 3,900 feet. No. 6014. Shrub, flowers waxy-white.

Distrib. Mt. Ophir, Perak.

RUBIACEÆ.

38. *Ophiorrhiza tomentosa*, Jack. Kedah Peak (No. 6037).

Distrib. Penang, Perak.

Oldenlandia diffusa, Roxb. By sides of streams. Kedah Peak. Flowers white. No. 6147.

Distrib. Trop. Asia.

39. *Hedyotis capitellata*, Wall. Gurun. Creeper, flowers greenish-white. No. 6175.

Common all over the peninsula.

40. *Hedyotis pedunculata*, King, Kedah Peak. At 3,000 feet. Flowers lilac.

Endemic.

41. *Hedyotis flexuosa*, Ridl. Kedah Peak. (5988). Also Mt. Ophir and Batu Pahat.

42. *Hedyotis macrophylla*, Wall. Gurun. Flowers white. No. 6177.

Distrib. Malacca, Penang.

43. MYRIONEURON MICROCEPHALUM, *sp. nov.*

A shrub, branches slender, pale coloured. Leaves lanceolate, membranous, long acuminate, narrowed to the base, nerves 6 pairs, inarching within the margin, 4 inches long, 1–7 inches wide, ·2 inches long. Stipules ·1 inch long, tubular, with two broad acute points and two subulate bristles. Inflorescence terminal of 2–3 short branches, peduncle less than ·1 to ·2 inches long. Flowers few 3–4, subsessile. Bracts lanceolate as long as the flower, acuminate. Ovary obconic with wavy ridges. Calyx-lobes 5 linear, acuminate. Corolla hardly longer, tube very short, cylindric lobes much longer, linear acuminate, ·2 inches long.

Gurun. No. 6180*a*.

The genus *Myrioneuron* occurs in India and Borneo, but this is the first species recorded from the Malay Peninsula.

It is very distinct from the other species, which have large heads of flowers in its only having 3 or 4 quite small ones on a short peduncle. There is no fruit on any of the specimens and only a few flowers and some buds. The stamens and style in the two I could examine were destroyed by some hymenopterous insect.

44. *Argostemma unifolium*, Benn. Kedah Peak, on rocks at 3,000 feet. Flowers white. No. 6116.

Distrib. Penang.

45. *Urophyllum streptopodium*, Wall. Gurun. Mixed with Myrioneuron No. 6180*a*.

Common whole Peninsula.

46. *Pavetta indica* var *polyantha*. Kedah Peak at 3,500 feet. No. 6119.

Common all over the Peninsula.

47. *Ixora Brunonis*, Wall. Gurun. Flowers white, slightly scented. No. 6176.

Distrib. Penang, Perak, also Burmah.

48. *Ixora stricta*, Roxb. Gurun. Six feet tall. Flowers salmon pink. No. 6161.

Distrib. Indo-Malaya.

49. *Ixora congesta*, Roxb. Kedah Peak at 1,500 feet. Ten feet tall, orange red. No. 6150.

Distrib. Burmah, Malaya.

50. *Ixora arguta*, Br. Gurun. Shrub, flowers white. No. 6141.

Distrib. Whole Peninsula.

51. *Canthium didymum*, Gaertn. Kedah Peak 2,500 to 3,200 feet. Shrub, flowers greenish 6132.

Common all over the Peninsula.

52. *Randia macrophylla*, Benth. Gurun 6179, 6157. Whole Peninsula and Sumatra.

53. *Hydnophytum formicarium*, Jack. Kedah Peak at 3,000 feet. No. 6054, 6076.

Whole Peninsula.

54. *Psychotria polycarpa*, Hook, fil. var. Kedah Peak. Creeper, fruit white. No. 6032.

This is the stiff leaved form which also occurs on Mt. Ophir.

55. *Lasianthus cyanocarpus*, Jack. Kedah Peak at 1,500 feet. Shrub, flowers white, fruit turquoise. No. 6143.

Distrib. Indo Malaya.

56. *Lasianthus appressus*, Hook fil. Gurun. Herb, flowers white, fruit black. No. 6154.

Distrib. Whole Peninsula.

57. *Lasianthus Wrayi*, King. Small shrub, fruits purplish. Kedah Peak 6065.

Distrib. Perak.

58. *Chasalia curviflora*, Thw. Gurun. 6158, 6159.

Common all over the Malay Peninsula. var *angustifolia*.

Kedah Peak at 3,000 feet. No. 6051.

59. *Saprosma pubescens*, Ridl. Gurun. Shrub 7 feet tall. Also on Mt. Ophir.

60. *Cephaelis Griffithi*, Hook. fil. No ticket.

61. *Cephaelis Ridleyi*, King. Kedah Peak 2,500 to 3,000 feet. Shrub, flowers waxy-white.

COMPOSITÆ.

62. *Gynura sarmentosa*, DeC. Kedah Peak at 3,996 feet. No. 6044.

Distrib. Whole Peninsula.

63. *Erechthites valerianifolia*, DeC. *Gynura rosea* Ridl. *Gynura bicolor* King, not DeC.

Kedah Peak beneath the Trig. station, no doubt brought by coolies. Flowers pink. No. 6038.

A South American weed spreading all over the old-world tropics.

VACCINIACEÆ.

64. VACCINIUM EBURNEUM *sp. nov.*

Tree up to 20 feet tall, much branched. Leaves thickly coriaceous, elliptic ovate, narrowed equally to both ends, apex acute, base cuneate, nerves ascending 3–4 pairs slender, 1–5 to 2 inches long, ·5 to ·8 inches wide. Petiole ·1 inch long. Raceme 1–5 inch long, flowers waxy white, pendulous on one side ·25 inche long; pedicels ·15 inche long. Calyx lobes ovate, subacute or rounded edges ciliate. Corolla cylindric, lobes short, ovate, recurved, glabrous. Stamens short, about half the length of the corolla, filaments hairy; anthers oblong, connective, prolonged oblong crenulate, cell-spurs subulate. Style stout pubescent, longer than the corolla, ovary half inferior. Kedah Peak at 3,000 feet. No. 5986.

Allied to *V. Kunstleri*, King & Gamble.

65. *Vaccinium malaccense*, Wight. Kedah Peak. Also collected here by Lobb.

All over the Peninsula, but local.

ERICACEÆ.

66. *Rhododendron jasminiflorum* Hook. Kedah Peak at 3,000 feet. Flowers white, flushed pink. No. 6057. Flowers white, Shrub. No. 6030.

Mt. Ophir and Perak Hills.

67. *Rhododendron Teysmanni* Miq. Small shrub, flowers apricot yellow.

Kedah Peak. No. 5966.

68. *Rhododendron leucobotrys* Ridl. A tall shrub, flowers white. No. 6033.

Endemic on Kedah Peak.

69. *Rhododendron longiflorum* Lindl. Kedah Peak from 3,800 feet upwards. Flowers "Rose dorée." No. 5967.

Epacrideæ.

70. *Leucopogon Malayana* Jack. var *moluccana.*

Kedah Peak at 3,000 feet. No. 5983.

Distrib. of variety Tenasserim collected on Kedah Peak by Low.

Myrsineæ.

71. *Myrsine Porteriana* Wall. Kedah Peak 3,500 feet. Small shrub, flowers white 6075. *Distrib.* Penang, Pahang, Selangor or Perak and Mt. Ophir.

72. *Labisia pumila* Benth. var *lanceolata.* Kedah Peak 2,500 to 3,000 feet alt. No. 6125.

Common all over the Peninsula, Sumatra, and Borneo.

73. *Ardisia colorata* Roxb. var *salicifolia* King. Kedah Peak. Small tree 20–25 feet tall, flowers pink at 3,000 feet. No. 6094.

Distrib of variety, Perak and Malacca.

74. *Ardisia crenata* Roxb. No specific locality. Distrib. Burmah to China and Japan. Common.

Gentianaceæ.

75. *Canscora andrographioides,* Griff.

A slender herb over a foot tall, stems 4 angled. Leaves lanceolate, acuminate, acute, narrowed at the base, 3-nerved, 2 inches long, ·3 inches wide, lower ones 1·5 inches long, ·4 inches wide. Flowers solitary, axillary on pedicels 1 inch long with 2 pairs of small leaves. Calyx ·5 inches long, cylindric, narrow, not winged, lobes narrow acuminate. Corolla white ·4 inches across, lobes narrow.

Kedah Peak at 3,000 feet. No. 6072.

An addition to our flora. A native of India and Burmah.

Oleaceæ.

76. Jasminum Kedahense *sp. nov.*

Jasminum Maingayi var *Kedahense* King & Gamble.

Climber; branches rather stout, pubescent. Leaves stiffly coriaceous, ovate, base rounded, apex acuminate, blunt, nerves 4 pairs sunk above, elevate beneath, above glabrous, beneath the

nerves and often whole surface of the leaf pubescent, 3 inches long, 2 inches wide, petiole ·2 inches long, pubescent. Flowers about 14 crowded in a terminal head, peduncle and pedicels ·2 inches long or less, pubescent. Calyx tube obconic, lobes narrow, linear, acuminate, hairy, ·2 inches long. Corolla glabrous, tube 1·5 inches long, ·2 inches wide.

Kedah Peak at 3,000 feet, Padang, to Seh. No. 5981, 6077. This beautiful Jasmine was first collected by me in fruit only on Kedah Peak. The specimens however were too incomplete for description and Dr. King and Mr. Gamble made it a variety of *J. Maingayi*, Clark, suggesting that it might be a distinct species. The excellent specimens above described show that it is quite distinct.

STYRACEÆ.

77. *Symplocos prunifolia*, Ridl. Shrub, flowers white. Kedah Peak 6096.

Distrib. Gunong Tahan and other mountains.

APOCYNACEÆ.

78. *Alyxia pilosa*, Miq. Creeper or semiscandent shrub, flowers white. Kedah Peak at 3,000 feet. No. 6092.

Also in Perak, Bujang, Malacca and on Mt. Ophir, and in Sumatra and Borneo.

79. *Ervatamia Malaccensis*, King & Gamble. Gurun No. 6171. Shrub 10 feet, capsules chrome yellow.

Distrib. Whole Peninsula.

ASCLEPIADEÆ.

80. *Dischidia bengalensis*, Colebr. No special locality.

Distrib. India, whole Peninsula, Java, Borneo.

LOGANIACEÆ.

81. *Gaertnera oxyphylla*, Benth. *Gaertnera Kocnigii* var *oxyphylla* Clark. Leggy shrub, flowers white, Kedah Peak 2,500 to 3,000 feet alt. No. 6013.

The latter a narrow stiff-leaved form.

This plant has long been mixed with the *Gaertnera Koenigii*, Wight, of Ceylon, as a variety, but it seems to me clearly distinct.

CONVOLVULACEÆ.

82. LETTSOMIA ARGENTEA, *sp. nov.*

Shrubby climber, stems ·2 inches through, woody shortly, silky hairy. Leaves lanceolate, acuminate, blunt, the mid-rib running out into a small mucro, base narrowed, blunt, subcoriaceous, silky on both sides but densely so on the back, nerves sunk above, elevate beneath about 10 pairs, ·3 inches long, 1 inch across, petiole ·5 inches.

Cymes lax, silky, 3–4 flowered, peduncle ·5 inches long, pedicels as long. Sepals ovate rounded, sub-equal, stiff, ·4 inches long, silky outside, glabrous within. Corolla and stamens not seen. Style ·3 inches long, filiform. Berry globose, covered with thick red pulp, 2 celled.

Kedah Peak 2,500 feet to 3,000 feet. A very beautiful plant, silvery silky all over.

Scrophularineæ.

83. *Torenia peduncularis*, Benth. Kedah Peak at 1,500 feet. No. 6145. Herb, flowers purplish violet.

Distrib. Malaya.

Utriculariaceæ.

84. *Utricularia involvens*, Ridl. Kedah Peak at 3,000 feet. No. 5959. The only known locality.

85. *Utricularia ophirensis*, Ridl. Kedah Peak No. 6112. Flowers purple.

86. *Utricularia striatula*, Sm. *Utricularia orbiculata*, Wall. At 3,000 feet. No. 5976, on rocks among moss, general color of plant pale violet.

87. *Utricularia nigricaulis*, Ridl. Among moss in stream, flowers pale violet. No. 5956.

Distrib. Pahang.

Gesneraceæ.

88. *Aeschynanthus Lobbiana*, Hook. Kedah Peak 3,000 feet. No. 5997, No. 6049.

Distrib. Malaya.

89. *Didymocarpus citrina*, Ridl. Kedah Peak at 3,000 feet. No. 6004. Endemic.

90. *Didymocarpus sulfurea*, Ridl. Kedah Peak, on rocks, flowers yellow. No. 6052.

Distrib. Selangor and Perak.

91. *Boea elegans*, Ridl. Kedah Peak, on rocks below beacon. Leaves silvery. No. 6062.

Only known locality.

Acanthaceæ.

92. *Pseuderanthemum porphyranthos*, Clarke. Kedah Peak, small shrub, flowers lilac. No. 6149.

Distrib. Whole Peninsula.

Verbenaceæ.

93. *Clerodendron deflexum*, Wall. Kedah Peak at 3,500 feet. 6117. Common all over the Peninsula.

LABIATÆ.

94. *Scutellaria discolor*, Colebr. Kedah Peak at 3,800 feet. No. 6036. Flowers purplish.

Distrib. Indo-Malaya, not common in the Peninsula.

95. *Gomphostemma oblongum*, Wall. Kedah Peak at 1,500 feet. No. 6144. Small shrub, fruit white.

APETALÆ.

PIPERACEÆ.

96. *Piper penangense*, C. de C. Kedah Peak at 3,500 feet. No. 6115; also occurs in Penang.

NEPENTHACEÆ.

97. *Nepenthes gracilis*, Korth. Kedah Peak, Padang To Seh. 3,000 feet, 5969.

98. *Nepenthes ampullaria*, Jack. At 3,000 feet. No. 6050.

BALANOPHORACEÆ.

99. *Rhopalocnemis ruficeps*, Ridl. Rich strawberry red, root stock yellowish. No. 6107.

Distrib. Perak, Penang.

LORANTHACEÆ.

100. *Korthalsella japonica*, Engl. On *Alyxia* and other shrubs. No. 6079. Also collected by me here and on Mt. Ophir.

Distrib. India, China, Japan, Australia.

101. *Loranthus ferrugineus*, Roxb. At 2,800 to 3,000 feet. No. 6131.

Common in the Peninsula.

102. *Elytranthus avenis*, Don. At 3,000 feet. No. 5980. Also collected here by Lobb and myself.

Distrib. Java, Sumatra.

PROTEACEÆ.

103. *Helicia attenuata*, Bl. At 3,500 feet. Tall shrub flowers greenish. No. 6118.

Distrib. Whole Peninsula and Java.

THYMELEACEÆ.

104. *Wikstroemia Candolleana*, Meissn. At 2,800 to 3,000 feet. Small shrub, flowers yellow.

Distrib. Gunong Tahan and other mountains of the Peninsula.

SANTALACEÆ.

105. *Henslowia varians*, Bl. A climber, rather slender. Leaves oblanceolate or obovate, obtuse, rounded, narrowed at the base, nerves 5, conspicuous on both sides when dry, 1·75 to 2 inches long, ·5 to 1 inch wide, petiole ·5 inches long. Flowers yellowish, solitary or 2-4 axillary on very short peduncles with one or more ovate bracts. Perianth tubular ·1 inch long, lobes ovate acute. Fruit very small, red, 1 inch through, globose or oblong globose with 5 longitudinal grooves, and transverse ones, making it nodulose.

At 3,000 feet; flowers yellowish. No. 6088.

Distrib. Java.

This is not the plant described in the Materials by Gamble as *H. varians* Bl., which appears to me to be certainly *H. umbellata* Bl. and has shorter tubed flowers, many in an axil, on longer pedicels and a considerably larger fruit. *H. varians* Bl., very well figured in Mus. Bot. I. pl. xliii. has a very small fruit resembling that of *H. buxifolia* Bl. This latter species however is more of an erect shrub with round leaves and is entirely yellow in leaf and stem; usually found in low ground near the sea. It is quite possible that some of the specimens quoted as *H. buxifolia* Bl., from mountain districts, are *H. varians* Bl.

Henslowia Ridleyi, Gamble. In the account of the flora of Gunong Tahan published in the Journal of the Federated Malay States Museum, Vol. vi., p 170, I described a plant to which I had originally given the name of *H. minor*, but the account of this genus by Gamble being published before this paper was printed I thought that *H. minor* was the plant intended for *H. Ridleyi* by Gamble, as he had given Gunong Tahan as a locality. I therefore gave the description as that of *H. Ridleyi*. I have since found out that the plant intended as *H. Ridleyi* by Gamble is quite a different species, though it occurs in the same localities. The name *Henslowia minor* therefore I restore for the species described as above under the name *H. Ridleyi*.

LAURINEÆ.

106. NOTHOPHOEBE ANGUSTIFOLIA, *sp. nov.*

Shrub 4 feet tall. Leaves alternate, coriaceous, lanceolate, acuminate, narrowed at the base, nerves about 10 pairs, very inconspicuous, 3·5 inches long, 1 inch wide, petiole 2·5 inches long. Panicle 1·5 inches long, ·5 inches wide, about ·5 inches across, sparsely pubescent, pedicels nearly ·1 inch long, silky. Flowers dirty yellowish-green, ·1 inch long. Buds oblong blunt. Perianth segments subequal, ovate; oblong, obtuse, pubescent, inner row slightly smaller, connate shortly at the base. Stamens, outer row 3 with hairy slender filaments, anthers 4-celled, introrse, second row similar, third row introrse, glands oblong, flat, glabrous. Staminodes

villous. Ovary obovoid, narrowed at the base. Style filiform, rather stout, stigma capitate. At 3,800 feet. No. 5996. Shrub 4 feet tall, flowers dirty yellowish-green.

This is possibly a *Machilus*, of which it has more the habit, but I have seen no fruit.

EUPHORBIACEÆ.

107. *Phyllanthus frondosus*, Wall. Small shrub, flowers pinkish, 3,000 feet. No. 6103.

Common in the hill forests.

108. *Sauropus forcipatus*, Hook. fil. At 1,500 feet. No. 6146. Shrub, flowers yellowish.

Distrib. Malay Peninsula.

109. *Coelodiscus montanus*, Muell. Arg. Gurun. No. 6173. Small shrub 4–5 feet.

Distrib. Malay Peninsula.

Mallotus porterianus, Muell. Arg. 2,800 to 3,200 feet. No. 6129. Small shrub, fruit prickly.

110. *Galearia Lindleyana*, Muell. Arg. Gurun. No. 6170. Large under-shrub 10–15 feet tall.

Distrib. Malaya.

111. *Agrostistachys filipendula*, Muell. Arg. Tall shrub, flowers yellow. 2,500 to 3,000 feet. No. 6017.

Exoecaria quadrangularis, Muell. Arg. Kedah Peak. No. 6126. Hills of the peninsula.

CONIFERÆ.

112. *Dacrydium elatum*, Br. At 3,000 feet. Tree up to 40 feet tall. No. 6053.

Distrib. Tenasserim and mountains of the Malay Peninsula.

113. *Agathis loranthifolia*, Salisb. At 3,000 feet. No. 6106.

Distrib. Penang and Perak hills.

GNETACEÆ.

114. *Gnetum campestre*, Gamble mss. *G. microcarpum* var. *campestre*, Ridl. At 3,000 feet. Padang 'To Seh. No. 5972.

ORCHIDEÆ.

115. *Liparis Maingayi*, Ridl. Damp rocks at 3,500 feet. No. 6121.

116. *Dendrobium revolutum*, Lindl. At 3,000 feet. On trees. Flowers white, upper wings of lip brownish, lower more yellowish. No. 5951.

Distrib. From Tenasserim to Rhio.

117. *Dendrobium villosulum*, Wall. At 3,000 feet. Flowers creamy yellow. Sepals faintly striped darker. No. 6113. Lip pale orange. Petals and sepals pale cream, lined with brown. No. 6137.

118. *Dendrobium hymenopterum*, Hook. fil. At 3,000 feet. Flowers pale lilac, sides of column orange. Nos. 5952, 5953.

Distrib. Pahang, Perak and Lankawi.

119. *Desmotrichum Kelsalli*, Ridl. Kedah Peak. Flowers reddish brown. No. 6031.

Distrib. Pahang, Malacca, Perak.

120. *Bulbophyllum longiflorum*, Ridl. At 3,500 feet. Flowers white, petals and sepals with regular lines of magenta. Lip and column orange. No. 6084.

121. *Bulbophyllum concinnum*, Hook. fil. No. 6087. Epiphyte. Flowers pale yellow.

Distrib. Malay Peninsula, and Borneo.

122. *Bulbophyllum Selangorense*, Ridl. Flowers yellow, lip apricot. No. 6028.

Distrib. Selangor Mountains.

123. *Eria lorifolia*, Ridl. On dead logs at 3,000 feet. No. 6061. Endemic.

124. *Eria floribunda*, Lindl. 6059. In fruit only.

Common in the Peninsula and Borneo.

125. *Eria teretifolia*, Griff. Flowers pale lemon, base of column pale yellow, edged magenta, lip reddish distally. No. 5978.

Common in the hills of the Malay Peninsula and Borneo.

126. ERIA DILUTA *sp. nov.*

Rhizome apparently long, creeping, stems erect, remote, ·4 inches long, slender, covered with lanceolate, acute brown sheaths, ·4 inches long. Leaves narrow, linear, acuminate, acute, base narrowed, 3·75 inches long, ·4 inches wide. Raceme subterminal ·5 inches long, covered with brown, lanceolate acuminate bracts 2-flowered. Pedicel ·4 inches pubescent. Sepals ·3 inches long, lanceolate, acute, yellowish-white, laterals nearly ·2 inches wide. Mentum short and broad. Petals linear, acute, as long as sepals but much narrower. Lip trifid, as long as sepal, lateral lobes falcate, broad, midlobe oblong, subacute, dilate towards the tip, at the base two short ridges meeting in a V, fleshy, thick, 2 short undulate ridges along the lobe bases, one median running to tip elevate into a prominent keel, undulate. Column long, curved, margin entire, highly elevate, filament rather long. Anther phrygian-cap-shaped and blunt. At 3,000 feet. Flowers yellowish white. Lip and column tinged brownish-pink. No. 5980.

Apparently allied to *Eria nutans*, Lindl. and *Eria ramulosa*, Ridl.

127. *Eria xanthocheila*, Ridl. At 3,500 feet. Sepals whitish-green, faintly veined with reddish. Lip yellow. No. 6120.

Distrib. Malay peninsula.

128. *Eria tenuiflora*, Ridl. At 3,000 feet. No. 6074.

Distrib. Malay peninsula and Borneo.

129. *Ceratostylis gracilis*, Bl. At 3,800 feet. Flowers yellowish, lip pale red. No. 6006.

Distrib. Malay peninsula and islands.

130. *Trichotosia poculata*, Ridl. Kedah Peak. No. 5999. Also in Perak and Mt. Ophir.

131. *Trichotosia aporina*, Hook. fil. Flowers campanulate, white. At 3,000 feet. No. 5965.

Distrib. Malay peninsula.

132. *Plocoglottis javanica*, Bl. At 1,500 feet. Flowers crimson and yellow. No. 6140.

Distrib. Malay peninsula, Java.

133. *Spathoglottis aurea*, Lindl. The true, deep coloured form (*Spathoglottis Wrayi*) leaves often reddish beneath. No. 5992.

Distrib. Malay and Borneo mountains.

134. *Calanthe angustifolia*, Lindl. At 3,500 feet. Flowers white, ridges to base of lip faintly yellow. No. 5993.

Mountains of Malay peninsula.

135. *Calanthe* (Limatodes) *gracilis*, Lindl. Stem 3 inches or more. Leaves lanceolate, acuminate plicate, narrowed towards the base, ·9 inches long, 1·25 inches wide. Scape slender from the stem below the leaves. 20 inches long, puberulous. Flowers about 15 remote, pedicels ·3 inches long. Sepals lanceolate, acuminate, narrow, pubescent outside ·4 inches long. Petals linear, lanceolate, acuminate glabrous. Lip spurless, 3 lobed, side lobes long, lanceolate, acute, midlobe fleshy at base, longer, ·3 inches long, oblong with a small orbicular, undulate, crenulate, bilobed lamina, claw of midlobe channelled with thick fleshy ridges, and a hairy mass at the base. Column short, thick and free from the lip. At 3,000 feet. Flowers white, sides of lip yellow. No. 5998. *Distrib.* North India, Siam and China. A good addition to our Flora.

136. *Arundina Philippii* var. *Malayana*, Ridl. At 3,000 feet. Tip of lip pale pink, throat yellow. No. 5982. Found here by me also.

137. *Coelogyne perakensis*, Rolfe. At 3,000 feet. Flowers apricot yellow, throat rich chrome. No. 6060. *Distrib.* Perak Hills. Pahang.

138. *Coelogyne pallens*, Ridl. Flowers delicate, greenish-white, edges of lip fringed. At 3,000 feet. No. 6085. Also collected here by Mohammed Aniff. *Distrib.* Perak Hills.

139. *Bromheadia palustris*, Lindl. At 3,000 feet. No. 6073.

140. *Agrostophyllum callosum*, Bl. 2,500 to 3,000 feet. Flowers pale cream. No. 6133.

141. *Acriopsis Ridleyi*, Hook. fil. At 3,000 feet. Padang To Seh. Flowers yellow, spotted with purple, column pinkish. Nos. 5973, 5974.

This is an unexpected discovery. The species was only known hitherto from a single specimen obtained by me on a pepper stump in Singapore, no doubt found by a Chinaman in felling the forest and put to grow on the stake. No other specimen has been seen till in the present collection comes a fine series from the other end of the peninsula.

142. *Oxyanthera elata*, Hook. fil. 2,500 to 3,000 feet. No. 6018.

Distrib. Whole peninsula, Java, Sumatra and Borneo.

143. *Podochilus muricatus*, Schlt. At 3,000 feet. Flowers white, hairy, throat purple. No. 5990.

144. *Podochilus cornuta*, Schlecht. Kedah Peak, no special locality. No. 6090.

145. *Podochilus sciuroides*, Reichb. At 3,000 feet. No. 5952.

146. *Tropidia squamata*, Bl. Flowers white, with a slight greenish cast. No. 6012.

Distrib. Malay Peninsula and Borneo.

147. *Anoectochilus Reinwardtii*, Bl. Flowers white, stem reddish. 3,000 feet. No. 5977.

Also occurs in the Perak Hills, Java and Sumatra.

APOSTASIACEÆ.

148. *Apostasia nuda*, R. Br. Without locality.

Distrib. Whole peninsula.

SCITAMINEAE.

149. *Costus speciosus*, var. *argyrophyllus*. At 2,800 to 3,200 feet. No. 6128.

Common all over the peninsula.

150. *Globba panicoides*, Miq. At 3,000 feet. No. 6070.

Distrib. Whole peninsula and Sumatra.

151. *Hedychium collinum*, Ridl. Flowers white, heavily scented at 4,000 feet. No. 6027.

The original locality for this species.

BURMANNIACEÆ.

152. *Burmannia disticha, L.* At 3,000 feet. Padang To Seh. Flowers usually large, with many heads, pale blue. No. 5961.

Distrib. Indo-Malaya, China, Australia.

LILIACEÆ.

153. *Protolirion paradoxum,* Ridl. and Groom. On dead leaves at 3,800 feet. No. 6000.

Distrib. All over the Malay Peninsula at high altitudes.

154. *Dianella ensifolia,* Red. 3–4,000 feet. Nos. 5994, 6001.

155. *Dracaena terniflora,* Roxb. About 3 feet tall. Gurun. No. 6165.

156. *Smilax calophylla,* Wall. Kedah Peak, 3,500 feet. No. 6135.

Distrib. Whole peninsula.

157. *Smilax laevis,* Wall. Climber, flowers greenish yellow, at 3,000 feet. No. 6066.

Distrib. Malay Peninsula, China.

FLAGELLARIACEAE.

158. *Susum malayanum,* Hook fil. Kedah Peak. No. 6,011. Unripe fruit, whitish.

Distrib. Malay peninsula.

PALMAE.

159. *Licuala Scortechinii,* Becc. Short stemmed palm 2,500 to 3,000 feet. No. 6016.

Distrib. Malay Peninsula.

160. *Pinanga disticha,* Bl. Gurun. No. 6152.

Distrib. Malay Peninsula and Borneo.

161. *Iguanura Wallichiana,* Hook. fil. Gurun. No. 6151. Small palm stem about 4 feet, flowers white.

Distrib. Malay Peninsula.

162. *Calamus ramosissimus,* Griff. At 2,500 to 3,000 feet. Inflorescence greenish white. No .6015.

Distrib. Malay Peninsula.

PANDANACEAE.

163. *Pandanus collinus,* Ridl. Kedah Peak. No. 6127.

Distrib. Mountains of Malay Peninsula.

CYPERACEÆ.

164. *Mariscus Sieberianus,* Nees. Kedah Peak 3,000 to 3,500 feet. No. 6046.

Unusually high for this common lowland plant.

165. *Actinoschœnus filiformis*, Benth. At 3,000 feet. No. 6109.

Distrib. Malay Peninsula, China.

166. *Hypolytrum latifolium*, Rich. At 1,000 feet. No. 6142.

167. *Gahnia javanica*, Moritz. At 3,000 feet. No. 5970.

Distrib. All high mountains in the Malay Peninsula and Java.

168. *Gahnia tristis*, Nees. Padang 'To Seh 3,000 feet. No. 5964.

Usually a sea shore plant, but it also occurs on Mt. Ophir.

169. *Scleria multifoliata*, Bœck. At 3,000 feet. No. 6108.

Usually a hill plant but it does occur in the low country.

170. *Carex indica*, L. At 3,000 feet. No. 6136.

Scattered over the peninsula, India and Malay peninsula.

Gramineæ.

171. *Isachne rigida*, Nees. A stiff, erect grass 18 inches tall, leaves stiff, lanceolate, acuminate, acute, coriaceous, glabrous, strongly ribbed, edge denticulate, base cordate ·5 inches long, ·2 inches wide, sheath smooth or occasionally armed with stiff cilia rising from pustules. Panicle 1 inch long, ·7 inches across, spreading, lax, stiff. Outer glumes round pubescent.

At 3,000 feet. No. 6111. Rare in the peninsula. Only collected in our area at Setul. It occurs often in sandy spots on heaths and dry spots on mountains in Borneo and Java.

Ischæmum Fieldingianum, Rendle. At 3,000 feet. Padang 'To Seh in open spaces. No. 5958.

Also Mt. Ophir.

172. Eulalia lanipes, *sp. nov.*

Base of stem and sheaths densely white, woolly. Leaves flaccid, 20 inches long, ·2 inches wide, linear, gradually acuminate, bases white-hairy, ligule white-silky hairy. Culms rather slender, terete glabrous except at the top, 20 inches long. Spikes 3–8, six inches long, densely white, hairy. Flowers in pairs, one sessile and one stalked, similar pedicel and outer glumes covered with long white hairs. Glume I and II lanceolate, acuminate, narrow, thin, hairy on the back with long soft hairs. III lanceolate, acuminate, very narrow, sparsely hairy. IV narrow, lanceolate, acuminate. Awn 7 inches long, base dark brown, spirally twisted, apex pale scabrid. Styles purple, short plumed. Caryopsis oblong, ellipsoid, narrowed at base, beaked with the remains of the style, light brown, smooth. At 4,000 feet. No. 6026.

A beautiful grass allied to *E. argentea*, Brngn. Voy. Coq. Bot. p. 92, but with much larger spikes and flowers and long acuminate narrow glumes, and the base of stems woolly.

173. *Oxytenanthera sinuata*, Gamble. At 3,000 feet. No. 6069.

Rather a rare or rarely collected Bamboo. Endemic.

FILICES.

174. *Gleichenia circinata*, Sw. At 3,000 feet. No. 6101. On all mountains.

175. *Gleichenia flagellaris*, Spr. At 3,000 feet. No. 6102.

176. *Alsophila commutata*, Mett. At 2,800 feet. No. 6042.

High mountains Malay Peninsula.

177. *Hymenophyllum Neesii*, Hook.

178. *Hymenophyllum Blumeanum*, Spr. No tickets.

179. *Davallia solida*, Nees. At 3,800 feet. No. 6045.

Common all over peninsula.

180. *Davallia bullata*, Wall. Kedah Peak. 3,500 feet. Got this on the precipice at the top of Kedah Peak. It is not common in the peninsula. No. 6130.

181. *Humata angustata*, Sm. At 3,000 feet. No. 5991.

182. *Lindsaya flabellulata*, Dry. At 2,500 to 3,000 feet. Common on high mountains. No. 6095.

183. *Matonia pectinata*, R. Br. At 3,000 feet. No. 6100. On all our mountains.

184. *Oleandra neriiformis*, Cav. At 2,500 to 3,000 feet. Nos. 5979, 6024.

On all our mountains.

185. *Polypodium decorum*, Brack. Kedah Peak. No. 6020

186. *Polypodium* (Pleopeltis) *stenophyllum*, Bl. At 2,500 to 3,000 feet. No. 6021.

Common in mountain districts.

187. *Polypodium* (Pleopeltis) *incurvatum*, Bl. At 2,500 to 3,000 feet. No. 6022.

Mountains of Malaya.

188. *Dipteris Horsfieldii*, Benn. At 2,500 to 4,000 feet. Fairly common. No. 6023.

Common on our shores and mountains.

LYCOPODIACEÆ.

189. *Lycopodium Hippuris*, Bl. At 3,500 feet. No. 6078. *Distrib.* Malay peninsula.

190. *Lycopodium cernuum*, Sw. At 3,800 feet. No. 6029. *Distrib.* All tropics.

191. *Lycopodium phlegmaria*, L. At 3,500 feet. No. 6002 on damp, open ground.

Common all over Tropical Asia.

192. *Selaginella Belangeri*, Spring. *S. proniflora*, Bak. At 3,000 feet. No. 6097.

Distrib. Malayan mountains.

193. *Selaginella canaliculata*, Spring. Gurun. No. 6174. Common in hill districts.

MUSCI.

By C. H. Wright.

194. *Syrrhopodon revolutus*, Dozy & Molk. At 3,000 feet. No. 6091.

LICHENES.

By Miss E. M. Wakefield.

195. *Cladonia bellidiflora*, Hærke. At 3,000 feet. No. 6009. Fructification scarlet.

VIII. A COLLECTION OF MAMMALS AND BIRDS FROM PULAU PANJANG OR PULAU MAPOR, RHIO-LINGGA ARCHIPELAGO.

By HERBERT C. ROBINSON, C.M.Z.S., M.B.O.U.

INDEX.

The mammals of the Rhio-Lingga Archipelago have been investigated in great detail during the last fifteen years and large collections have been made on the majority of the islands, by Dr. W. L. Abbott, Mr. C. B. Kloss and the Federated Malay States Museums, these collections having been reported on by Messrs. G. S. Miller, K. W. Lyon, Oldfield Thomas and R. W. Wroughton in the following papers.

Gerritt S. Miller, Jr. ... "Mammals collected by Dr. W. L. Abbott on Islands in the South China Sea."

Proc. Acad. Sci. Washington, ii, pp. 203—246 (1900).

Gerritt S. Miller, Jr. ... "Mammals collected by Dr. W. L. Abbott in the Region of the Indragiri River, Sumatra."

Proc. Acad. Nat. Sci. Philadelphia, 1902, pp. 143—159.

Gerritt S. Miller, Jr. ... "Seventy New Malayan Mammals."

Smithsonian Misc. Coll. vol. 45, pp. 1—73 (passim) (1903).

Gerritt S. Miller, Jr. ... 'The Mammals collected by Dr. W. L. Abbott in the Rhio-Linga Archipelago."

Proc. U. S. Nat Mus. vol. xxxi, pp. 247—286 (1906).

Gerritt S. Miller, Jr. ... "The Mouse Deer of the Rhio-Linga Archipelago: A study of specific Differentiation under uniform environment."

Proc. U. S. Nat. Mus. vol, xxxvii, pp. 1—9, Pls. 1—8 (1909).

Gerritt S. Miller, Jr. ... "Fifty-one new Malayan Mammals."

Smithsonian Misc. Coll. vol. 61, No. 21, pp. 1—28 (1913).

Marcus Ward Lyon, Jr. "Mammals of Batam Island, Rhio Archipelago."

Proc. U. S. Nat. Mus. vol. xxxi, pp. 653—657 (1907).

Marcus Ward Lyon, Jr. "Additional notes on mammals of the Rhio-Lingga Archipelago, with descriptions of new species and a revised list."

Proc. U. S. Nat. Mus. vol. xxxvi. pp. 479—491, Pl. 39 (1909).

Marcus Ward Lyon, Jr. "Tree Shrews: an Account of the Mammalian Family, Tupaidæ."

Proc. U. S. Nat. Mus. vol. xlv. pp. 1—88. Pls. 1—11 (1913).

Oldfield Thomas, and R. C. Wroughton. "Diagnoses of New Mammals collected by Mr. H. C. Robinson in the Malay Peninsula and Rhio Archipelago."

Ann. and Mag. Nat. Hist. (8) iii, pp. 439—441 (1909).

Oldfield Thomas, and R. C. Wroughton. "On Mammals from the Rhio Archipelago and Malay Peninsula, collected by Messrs. H. C. Robinson, C. B. Kloss and E. Seimund and presented to the National Museum by the Government of the Federated Malay States."

Journ. Fed. Malay States Mus. iv. pp. 99—129 (1909).

D. G. Elliot ... "Descriptions of apparently new species and sub-species of Monkeys of the genus, Callicebus, Lagothrix, Papio Pithecus, Cercopithecus, Erythrocebus and Presbytis."

Ann. and Mag. Nat. Hist. (8) iv, pp. 244—274 (1909).

D. G. Elliot ... "Descriptions of some new species of monkeys of the genera Pithecus and Pygathrix collected by Dr. W. L. Abbott and presented to the United States National Museum."

Proc. U. S. Nat. Mus. vol. xxxviii, pp. 343—352 (1910).

Almost the largest island that has remained unvisited by any naturalist is the one now under discussion. In view of its proximity to Bintang, the largest of the group, and the one possessing the richest fauna, it was thought that Pulau Mapor might also possess species of interest and I accordingly arranged to visit it and spent a few days there at the end of May and the beginning of June, 1915.

Our most cordial thanks are due to Mr. H. Spakler, at that time Consul General of the Netherlands in Singapore, who on this, as on numerous previous occasions proved most helpful in

obtaining for us the necessary permits from the local Dutch authorities. We are also indebted to the Resident of Rhiow, who instructed his local officers to afford us all the assistance in their power.

GEOGRAPHICAL.

Pulau Panjang or Mapor, as it is more generally known by its inhabitants is an island of roughly triangular shape with a greatest length and breadth of about three and a half to four miles, situated in Lat. 104°.50′ E. and Long. 1°N. about 10 miles from the east coast of Bintang, the straits separating it from that island carrying about twelve fathoms, though a bank with only 6 to 8 fathoms running from the S.E. of Mapor very nearly joins it to the larger island.

Except on the north and N.E. corner it is surrounded by a fringing reef of coral of varying breadth, with many outlying "mushrooms." and must therefore be approached with the greatest caution by those not in possession of local knowledge. A buoy on the N.E. corner however, afforded good anchorage in about six fathoms mud and is free from dangers, though the swell that frequently sets in from the East even in the S.W. monsoon makes it inconvenient for small vessels. The surface of the island is undulating and even rugged on the eastern side, the maximum elevation being about 340 feet. On this side there is still a good deal of old jungle though much of the better timber has been felled by Chinese for exportation to Singapore. In the remaining parts of the island most of the available land has in times past been cleared for the planting of gambier and on those plantations being abandoned has relapsed into thickets of Straits Rhododendron and resam (*Melastoma* and *Gleichenia*) very difficult to penetrate. In parts, however, the original forest, which consisted largely of a valuable timber tree (*tembusu*) (*Fagraea fragrans*) is taking hold again, the tree mentioned springing up again readily from stools.

On the western shore there are, in places, considerable flat areas, largely overgrown with lalang, and it is here, where they are sheltered from the violence of the N.E. monsoon, that the villages of the native inhabitants are found. These people are *Orang Laut* or *Jakun*, who under different tribal names are widely spread through the southern portion of the Malayan Peninsula and throughout the Rhio-Lingga Archipelago and portions of the adjacent low lying parts of Sumatra. They are of Proto-Malayan stock, at one time spoke a somewhat peculiar dialect and have only, in comparatively recent times, become converts to Islam, though they are now loathe to confess that they are other than Malays proper. In Mapor, where there are probably not more than a hundred individuals at the outside, they earn a precarious livelihood by fishing during the S.W. monsoon and by

collecting live turtle and tortoise-shell, the former of which are sold in Singapore while the latter finds a market in Rhio. They possess small kampongs where bananas, maize, *ubi kayu* and sugar cane are cultivated, but no rice is grown.

We stopped a couple of days on the Eastern side but being warned than the anchorage there was precarious in bad weather were conducted by a very tortuous and intricate channel to a little pool (it was hardly more) on the western side near an islet known as Mentigi, a commonplace name among orang laut people, where we remained a week.

The collecting was disappointing but besides the species actually secured we caught a fleeting glimpse of a *Tragulus*, while pig of both species, *Sus oi* and *Sus rhionis* are known to occur, but without dogs are difficult to obtain. In the sheltered bays in the vicinity Duyong (*Halicore duyong*) are very fairly common and are much hunted, cigarette holders made out of the canines being much prized and commanding a high price in Tanjong Pinang (the capital of Rhio). On our way back to Singapore we shot a small dark brown porpoise, one of a school? (*Flatanista sp.*) of fifteen or twenty, but it was seized by a shark and torn to pieces before we could secure it.

Of reptiles we got hardly any: *Cyclemys platynotus* is fairly common and so are *Draco volans*, *D. melanopogon* and *Mabuia multifasciata*, while we also secured specimens of the Hawks bill turtle. Near Mentigi was a pen in which were some fifty or sixty green turtle (*Chelone mydas*) which were bought up by a Chinaman for sale in Singapore and fed on a variety of sea-grass common in shallow bays in the neighbourhood.

SYSTEMATIC.

A. MAMMALS.

PITHECUS FASCICULARIS (Raffles).

Pithecus bintangensis, Elliot, Ann. & Mag. Nat. Hist. (8) iv, p. 257 (1909); id. Rev. Prim. ii, p. 246, pl. xxvii (1912).

1 ♂ ad. Mentigi, West Side Pulau Mapor, 6th June, 1915. F.M.S. No.

This *kra* belongs to the group with dark iron grey hands and feet, tail blackish above, on its basal portion silvery grey beneath, back of head and mantle annulated with black and rufous orange, the latter colour fading away towards the rump. Limbs and sides annulated with black and silvery grey. Dimensions (taken in the flesh). Head and Body, 395; (456) tail, 535; (505) hindfoot, 135 (117·5) ear 25 mm. (29).

Skull: Total length, 114 (105); occipito nasal length, 95 (85.5); zygomatic breadth, 73 (72·5); length of upper tooth row excl. canine 28.0 (26.7) mm.

The skull characters derived by Elliot from the small series at his command are worthless as subspecific characters

and the colour differences are also of dubious value, so I prefer not to apply any subspecific name to this monkey. In view of the general zoological affinities of the Rhio-Lingga archipelago it will probably prove to be allied rather to the Sumatran than to the Peninsular race and I have therefore used Raffles name which was conferred on specimens obtained in the neighbourhood of Bencoolen.

Measurements in Parentheses are those of the type of *Pithecus bintangensis* as given by Elliot.

CROCIDURA MAPORENSIS, Robinson & Kloss, sp. nov.

Type. Sub-adult female (skin and skull) collected on the East side of Pulau Mapor, Rhio-Lingga Archipelago, on 5th June, 1915, by H. C. Robinson.

Diagnosis. In colour closely resembling *C. aoris*, * but smaller, about the same size as *C. negligens* † but colour less pure grey. Skull rather broader than in the allied forms.

Skull: Broader relatively than that of *C. aoris* and rather more inflated in the anterior portion of the frontal region than in that species.

Measurements: Greatest length –(23·8)‡; basal length, 18.5 (21.1); lachrymal breadth of rostrum, 5·1 (4.9); greatest breadth above molars, 7·3 (7·9); cranial breadth above mastoid, 10·6 (10·5); maxillary tooth row, including incisors, 9·3 (10·0).

Remarks. Though the material is very bad, the only specimen obtained being much damaged by the trap and by ants, we have little doubt that the Mapor shrew is a fairly distinct form. It is the first occurrence of the genus in the archipelago.

TUPAIA CASTANEA REDACTA subsp. nov.

Type:– ADULT male (skin and skull), No. 355/15, Federated Malay States Museums, collected on East side, Pulau Mapor, Rhio Archipelago, 7th June 1915, by H. C. Robinson.

Characters:–Extremely close to *Tupaia castanea*, Miller, ¶ but somewhat smaller, the underparts especially the mesial streak and the thighs more rusty "ferruginous" Ridgeway (Pl. XIV) against "ochraceous tawny" (Pl. XV), and with the upper surface more chestnut, less maroon, mingled "Hays Russet (Pl. XIV) and 66 Xanthine Orange" (Plate III) against "Maroon" (Plate I).

Colour:– Top of head and sides of the face, hands and feet annulated black and buffy ochraceous, a buff ring round the eye. Rest of the upper surface rusty ferruginous, many of the hairs with glistening black tips. Tail except at the base above, where the hairs are tipped with black, almost uniform

* Ann & Mag. Nat. Hist. (8) x, p. 589 (1912).

† Ann & Mag. Nat. Hist. (8) xiii, p. 232 (1914).

‡ Measurements in parentheses are those of the type of *Crocidura aoris*.

¶ Smithsonian Misc. Coll. vol. 45, p. 54. 1903). Lyon, Proc. U.S. Nat. Mus. 4, p. 90, pl. 10, fig. 9 (1913.)

orange ferruginous, the hairs lighter below at their bases. Streaks from the ears orange buff, by no means conspicuous, beneath rusty ferruginous, a patch on breast and mesial line uniform, the rest with greyish bases to the hairs.

Skull:–Smaller than that of *T. castanea*, with the muzzle relatively shorter and blunter and the cranium less elongate. Palatal vacuities in both specimens available less defined than in the skulls of *T. castanea* in the collection. Teeth not different from those of the typical form.

Measurements:–Collectors external measurements (taken in the flesh):—.

Head and body 172 (201)*; Tail, 141 (151); Hindfoot, 38 (42.5) mm.

Cranial measurements: greatest length, 50·0 (54·0); basal length, 43·9 (46.3); palatal length, 26·7 (28·1)†; zygomatic breadth 24·9 (27·8); least interorbital breadth, 14·0 (15.0); cranial breadth, 20·0 (20.3); breadth of rostrum at diastema, 6·8 (7·1); lachrymal notch to tip of premaxillaries, 20·8 (23·0); upper molar series, 18·0 (19·2).

Specimens examined. The type and an immature female, (canine and *pm* at alveolus from the same locality.)

Remarks. The type specimen, though adult, is younger than the available series of seven skulls and four skins of T. castanea, from Pulau Bintang, having the orbital ring not completely ossified. It is however practically adult and has probably attained its full size. The other specimen is very considerably younger. Both are in somewhat worn pelage, while those from Bintang are in fresh, but I think it practically certain that the differences in colour will persist to a greater or less degree when specimens in similar condition are available for study. The differences are certainly of no less order than have been used to establish the majority of races formulated of late years.

Sciurus vittatus maporensis, subsp. nov.

Type:—Adult female (skin and skull). Federated Malay States Museums No. 289/16, collected on the West side of Pulau Mapor, Rhio Archipelago, on June 6th, 1915, by H. C. Robinson.

Characters: Most closely resembling the race from Pulau Tinggi but smaller, with the black lateral stripes, clearer and less sullied. Colour of the under surface varying from ochraceous buff through ochraceous orange to ochraceous tawny, whereas in the other races from the Rhio Archipelago the

* Measurements in parentheses are those of an adult male of *Tupaia castanea* collected at Sungei Biru, Pulau Bintang, June 12th, 1908. F.M.S. Mus. No. 1792/08.

† Measurements in parentheses are those of an adult female of *Tupaia castanea* collected at Pasir Panjang, Pulau Bintang on June 9th, 1908, F.M.S. Mus. No. 1790/08.

colour is more clearly rufous or "vinaceous rufous." Resembling *Sc. v. subluteus* in these respects but a much smaller form.

Measurements: External measurements of the type, taken in the flesh: head and body, 185, (176)*; tail, 162, (158); Hf., 41·5, (40); ear, 15 mm., (16·5).

Average and extremes of ten specimens: head and body, 183, (170–192); tail, 160·5, (142–175); hind-foot, 42·3, (40–46.5); ear, 16, (15–18). Cranial measurements of type: greatest length, 45·8 (45·1)*; condylobasilar length, 39·1 (38·8); diastema, 10·4 (10·3); zygomatic breadth, 28·3 (26·0); median length of nasals, 13·3 (13·1); upper molar series including pm^3 8·9, (8·3).

Average and extremes of ten specimens: greatest length, 47·1. (45·6–48·5); condylo-basilar length, 40·1, (38·2–42·0); diastema, 10·6 (10·0–11·2); zygomatic breadth, 28·4 (27·8–29.3); median length of nasals, 14·0 (13·3–14·8); maxillary tooth row including pm^3, 8·9, (8·4–9·3) mm. For detailed measurement see table on p. 67.

Specimens examined. Fifteen, all from Pulau Mapor.

RATTUS SURIFER LINGENSIS (Miller).

Mus lingensis, Miller, Proc. Acad. Nat. Sci. ii, p. 266 (1900); id. Proc. Acad. Nat. Sci. Philadelphia, 1902, p. 154; id. Proc. U.S. Nat. Mus. xxxi, p. 266 (1906); Lyon, op. cit, xxxi, p. 655 (1907); Thos. and Wrought. Journ. Fed. Malay States Mus. iv, p. 125 (1909); Lyon, Proc. U.S. Nat Mus. xxxvi, p. 484 (1909).

A very large series of this rat was collected on Mapor which for the present we refer to this race. The colour characters assigned to it as compared with E. surifer from the mainland hold good, viz., a dull, more clay-coloured tint with much less ochraceous orange on the flanks and a greater admixture of black on the back, but we are unable to see that the Rhio form has a narrower palate as stated by Miller. The tail is perhaps, on an average, relatively shorter than in the mainland form and the skull is somewhat more heavily built with a greater development of the ridges.

The skull dimensions, even if equally adult animals from the same island are compared are, as Lyon notes, variable. Specimens from Karimon and Kundur seem to be the largest and those from Battam and Bintang on the whole dullest in tint. The race is much more closely related to those inhabiting the islands of the east coast of the Peninsula than to the lightly built, bright coloured animal found in Singapore. *Epimys surifer leonis* (Robinson and Kloss). About fifty specimens, adult and young, were obtained. For measurements see p. 68.

* Measurements in parentheses those of the type of *Sciurus vittatus famulus* from Pulau Dayang nr. Pulau Aor (Robinson, Ann and Mag. Nat. Hist (8) X p. 592 (1912)

Rattus rattus batin, subsp. nov.

Type:—Adult male, aged (skin and skull). Collected at Mentigi, West side of Pulau Mapor or Panjang, Rhio Archipelago, on June 6th, 1915, by H. C. Robinson. Federated Malay States Museums No. 304/15.

Characters:—A member of that section of the *Epimys rattus* group, characterized by somewhat slender feet, hispid, but not very spiny pelage and marked development of long black piles on the lower back. Separable from the form * inhabiting the adjacent islands of Bintang and Battam by the very much lighter colour above and by the somewhat larger bullae.

Measurements:—External dimensions of the type, taken in the flesh: head and body, 208 (180); tail, 218 (195); hind-foot, 35·5 (34), ear 22 (20·5). Extremes of eight specimens, head and body, 171–208; tail, 193–218; hindfoot, 33·5–35·5; ear, 20–22.

Cranial measurements of type: greatest length, 44·4 (44·0); condylo-basilar length, 39·0 (39·0); diastema, 12·4 (12·9); zygomatic breadth, 20·0 (20·1); median length of nasals, 16·0 (16·3); upper molar series, 6·8 (6·9).

Extremes of twelve specimens; greatest length, 41·5–44·4; condylo-basilar length, 36·3–39·0; diastema, 11·6–12·6; zygomatic breadth, 18·8–21·2; median length of nasals, 14·0–16·1; upper molar series, 6·5–7·2 mm. For detailed measurement see table on p. 69.

Specimens examined:—Fifteen, from the east and west sides of Pulau Mapor.

Remarks:—The series examined, which was trapped both in old jungle and in the vicinity of the huts of the some what primitive *orang laut* people inhabiting the island are fairly uniform, the principal variation being in the degree of distinctness in the line of separation of the light undersurface from the flanks. The race closely resembles a form, as yet un-named, inhabiting the western islands of the Archipelago but appears to be somewhat more robust. The intrusion in the central islands of a race, *R. r. rhionis* which closely resembles the north European *R. rattus rattus* is a curious and as yet unexplained fact.

* *Mus rattus rhionis*, Thos & Wrought Ann. and Mag. Nat. Hist. (8) iii, p 441 (1909). Measurements in parentheses are those of an adult male topotype of *Mus rattus rhionis*, Thos & Wrought. F.M.S. Mus No. 2086/08.

Measurements of **Callosciurus vittatus maporensis**, Robinson.

	Sex	Head and Body.	Tail.	Hind-foot.	Ear	Skull. Greatest length.	Skull. Condylo-basilar length.	Skull. Diastema	Skull. Zygomatic breadth	Skull. Median nasal length.	Skull. Upper tooth raw.	Condition of teeth.	F.M.S. No.	Remarks
Pulau Mapor (E. side) ..	♀	192	175	46.5	15	48.1	42.0	10.9	..	14.2	8.8	worn	287/15	Adult.
,, (W. side) ..	♂	170	155	41.5	16	45.8	39.1	10.4	28.3	13.3	8.9	,,	289/15	,, Type.
,, ,, ..	♂	185	162	41.5	16	46.2	39.3	10.2	28.0	13.3	9.0	V. sl ,,	290/15	,,
,, (E. side) ..	♂	170	..	41	16	47.0	40.0	10.0	28.1	14.3	8.4	Ml. ,,	291/15	,,
,, ,, ..	♂	192	171	45	16	47.1	40.1	10.4	29.0	14.8	8.9	Sl. ,,	292/15	,,
,, (W side) ..	♀	174	148	40.5	15	45.6	38.2	10.0	27.9	14.0	8.8	Ml ,,	293/15	,,
,, ,, ..	♀	190	157	40	16	46.8	40.3	10.8	27.8	13.9	8.9	Un ,,	294/15	,,
,, (E. side) ..	♀	186	165	42	10	47.8	39.9	10.6	28.7	14.2	9.3	Sl. ,,	358/15	,, N.C.M.*
,, ,, ..	♀	185	148	43	16	47.9	40.4	10.9	28.4	14.2	9.1	Un ,,	360/15	,, ,,
,, ,, ..	♂	186	164	43	18	48.5	41.9	11.2	29.3	13.8	9.1	Sl ,,	361/15	,, ,,

* Native collectors' skin measurements.

Measurements of **Rats from Pulau Mapor.**

	Sex.	Head and Body.	Tail.	Hind-foot	Ear.	Skull. Greatest length.	Cond-ylo-basilar length.	Dia-stema.	Zygo-matic breadth	Median nasal length.	Upper tooth raw.	Condition of teeth.	F.M.S. No.	Remarks.
Rattus rattus lingensis (Miller).														
East side, Pulau Mapor ..	♀	186	164	37.5	21	43.1	39.2	12.8	20 0	16.7	6 0	M worn	297/15	
Mentigi, West side Pulau Mapor.	♀	209	176	40	21	46.1	39.8	13.2	..	18 2	6.3	V. ,,	298/15	
East side, Pulau Mapor ..	♀	183	162	37.5	22	43 7	36.2	12.2	19.6	16 1	6.2	M. ,,	299/15	
,, ..	♀	190	159	38 5	21	42.1	36.8	12.0	20.1	16.7	6.1	V. sl. ,,	300/15	
,, ..	♂	203	179	40.5	22	47.0	39.9	13.2	20.7	18.8	6.2	,,	301/15	
Mentigi, West side, Pulau Mapor.	♂	207	179	41.5	23	46.3	39.2	13.2	21.1	18.5	6 1	,,	303/15	
,, ..	♀	214	167	41.5	23	46.1	39.2	13.6	20.3	18.3	6.2	,,	305/15	
East side, Pulau Mapor ..	♀	200	172	37	21.5	44.1	37.9	13.0	19.6	18 6	6.1	V. ,,	309/15	
,, ..	♂	205	191	40	23	45.2	39.0	13.1	20.0	18.2	6.3	V ,,	316/15	
,, ..	♂	201	166	37	23	44.2	37 8	13.0	20.3	17.1	6.2	Sl ,,	320/15	
,, ..	♀	183	155	38	22	44.2	38.0	12.8	20.0	17.2	6.2	M ,,	326/15	
Mentigi, West side, Pulau Mapor.	♂	212	..	40	..	46.3	39.2	12.9	20 2	18.6	6.3	Sl ,,	329/15	
East side, Pulau Mapor ..	♂	..	..	..	..	43.6	37.8	13.2	18.2	18.0	6.2	,,	331/15	
,, ..	♀	182	153	36	22	43.1	37.2	13.0	20.0	16 4	6.0	Sl. ,,	334/15	Sub-Adult N.C.M.*
,, ..	♀	190	170	36	22	45.8	38.9	13.1	21.0	16.4	6 8	,,	337/15	Adult N.C.M.
,, ..	♀	192	158	38	22	44.9	38.6	13 0	..	17.1	6.3	,,	341/15	,, ,,
,, ..	♂	..	..	..	..	42.3	35.1	11.3	18.3	16.3	6.2	Un ,,	342/15	Sub-Adult.
,, ..	♂	196	179	38	23	46.5	39 0	13.4	21 1	18.8	6.3	,,	370/15	Adult N.C.M

* Native collectors' skin measurements.

MEASUREMENTS OF **Rats from Pulau Mapor**—*Continued.*

	Sex.	Head and Body	Tail.	Hind-foot	Ear	Skull. Greatest length.	Condylo-basilar length.	Diastema	Zygomatic breadth	Median nasal length	Upper tooth row.	Condition of teeth		F M S No	Remarks
Rattus rattus lingensis (Miller)—*Cont*															
East Side, Pulau Mapor ..	♀	188	152	35	23	43.1	36.3	12.7	19.5	15.9	6.1	M.	..	371/15	Adult N.C.M *
.. ..	♀	182	..	39	22	43.3	37.5	12.6	19.4	17.0	6.1	Sl.	..	372/15	.. ..
.. ..	♀	182	150	36	23	45.0	38.5	13.8	20.3	17.9	6.2		..	373/15	.. ..
.. ..	♀	195	166	37	23	45.9	39.0	12.8	20.9	18.2	6.3		..	379/15	.. ..
.. ..	♂	..	..	..	..	43.7	38.6	13.0	19.3	17.7	6.1	M.	..	380/15	
.. ..	♀	..	..	..	..	45.0	38.4	13.0	19.4	18.3	6.3		..	382/15	Adult aged.
Rattus rattus batin.															
East side, Pulau Mapor ..	♂	171	197	35.5	20	42.0	36.6	12.0	20.0	15.0	6.8	Sl	worn	295/15	
.. ..	♀	188	202	34	20	42.0	37.1	12.0	20.0	15.0	6.7	M.	..	302/15	
Mentigi, West side, Pulau Mapor	♂	208	218	35.5	22	44.4	39.0	12.4	20.1	16.0	6.8	V.	..	304/15	Type.
.. ..	♂	171	200	34.5	20	41.5	36.3	12.0	19.5	15.3	6.5	Un	..	306/15	
.. ..	♂	183	193	35.5	21	42.2	37.1	12.6	20.3	15.7	6.8	V. sl.	..	311/15	
East side, Pulau Mapor ..	♂	173	..	35	20.5	41.0	37.1	12.0	18.8	14.7	7.0	Un	..	317/15	
.. ..	♂	177	206	34	20	..	..	12.0	19.2	15.0	6.9	Un	..	319/15	
.. ..	♀	182	202	33.5	20	42.0	37.0	11.8	21.1	14.0	6.5	M.	..	322/15	
.. ..	♀	..	..	..	..	43.2	37.8	12.0	21.8	16.0	6.6		..	338/15	N.C.M
.. ..	♂	..	..	..	..	43.0	38.1	12.2	20.7	16.1	7.1	M.	..	346/15	..
.. ..	♂	..	..	..	..	43.2	37.3	11.6	20.3	15.2	7.2	Sl	..	348/15	..
.. ..	♀	..	..	..	..	44.0	38.3	12.1	21.2	15.8	7.1	Sl.	..	351/15	..

* Native collectors' skin measurement

II. BIRDS.

With the exception of a short list of birds collected on the "Lingga Islands," presumably Lingga itself, by the late Alfred Everetts' collectors by Dr. Hartert (Nov. Zool. vii, pp. 549–50 (1900) I am not aware of any account of the avifauna of any of the Rhio-Lingga Archipelago.

From an ornithologist's point of view most of the small Indo-Malayan islands lying within the 20 fathom line from larger land-masses are extremely uninteresting and Mapor, where, with the exception of two species of sun-birds, birds were very scarce both in species and individuals, proved no exception to this rule. A list of the specimens observed or obtained is however given, those of which no specimens were preserved being marked with an asterisk.

1. Treron nipalensis, Hodgs.

   1 ♂

2. Osmotreron vernans (Linn.)

   1 ♂, 1 ♀. Very common.

*3. Myristicivora bicolor (Scop.).

   Extremely abundant, roosting on the small islets off the coast.

4. Sterna bergii pelecanoides (King).

   Thalasseus bergii pelecanoides. *Oberholser, Proc. U.S. Nat. Mus.* 49, p. 523 (1915).

   Common off the sand spits and reefs on the western side of the island. Two specimens, male and female, with the exposed culmen 61.5 and 64 mm. appear to belong to this race.

5. Aecialitis alexandrina (Linn.)

   Antea, vol. V, p. 142. A single male of the tropical race of the Kentish Plover in breeding plumage.

*6. Numenius arquata (Linn.)

*7. Numenius phaeopus (Linn.)

   Both the Curlew and Whimbrel were fairly common round Mapor but were exceedingly wild and almost impossible to approach within gunshot.

8. Limonites ruficollis (Pall).

   A single female shot on June 6th.

*9. Ardea sumatrana, Raffles.

*10. Demiegretta sacra (Gm.).

   Common on the reefs.

*11. Haliaetus leucogaster (Gm.).

*12. Haliastur inter medius (Gurney).

   Common as everywhere else on the Malayan coasts.

13. HALCYON ARMSTRONGI, Sharpe.
Antea, vol. V, p. 145.
1 ♂, 1 ♀.
Not very abundant.

14. PELARGOPSIS MALACCENSIS, Sharpe.
Ramphalcyon capensis hydrophila, *Oberholser, Proc. U. S. Nat. Mus.* 35, p. 677 (1909).
1 ♂.
By no means common.

I find it impossible to follow Mr. Oberholser in his arrangement of the Peninsular forms of this genus and consider that all specimens from Bandon southwards to Singapore and the Rhio Archipelago must be regarded as identical subspecifically though specimens from Koh Pennan (*antea*, *vol.* V, p. 145, show an approach to *P. m. burmanica*, Sharpe, having a rather lighter pileum than the majority of Malayan specimens, though in this they agree with five skins, from the islands of Bintang, Battam and Mapor in the Rhio Archipelago which belong to the above cited *Ramphalcyon capensis hydrophila*, whose type locality is Singapore.

The dimensions of the Mapor specimen taken in the flesh were—Total length, 371; wing, 144; tail, 99; visible culmen, 85; bill from gape, 95; tarsus, 19.8 mm.

15. ANTHRACOCEROS CONVEXUS (Temm.)
1 ♂, 1 ♀ imm. Very fairly common.

16. HYPOTHYMIS AZUREA PROPHATA, Oberholser
Hypothymis azurea (Bodd.), *Hartert, tom. cit.* p. 550.
3 ♂, 1 ♀.
Fairly common.

17. MUSCITREA CINEREA, Blyth.
Muscitrea grisola (Blyth) *antea*, vol. V, p. 148.
4 ♂, 2 ♀.
Very numerous in small patches of mangrove as elsewhere throughout the Malay Peninsula in similar situations.

18. PYCNONOTUS PLUMOSUS, Blyth.
3 ♂. Fairly common in secondary growth.

19. CITTOCINCLA MACRURA (Gm.)
Cittocincla tricolor (Vieill.) *Hartert, tom. cit.* p. 550.
1 ♂, 1 ♀ imm.
Common.

20. ORTHOTOMUS RUFICEPS (Less.)
Hartert, tom. cit. p. 549.
A single rather immature female.

21. PHYLLOSCOPUS BOREALIS (Blas.).
Antea, vol. V, p. 150.
One female shot on June 4th. A late date for this migrant.

22. DISSEMURUS PARADISEUS (LINN.)
Dissemurus platurus (Vieill.) *Hartert, tom. cit.* p. 550.
3♂, 2♀. All in very worn plumage. Very common.

23. EULABES JAVANENSIS (Osbeck).
2♀. Very common.
Rather small in dimensions but not *E. intermedius* (A. Hay).

24. CALORNIS CHALYBEA (Horsf.)
Antea, vol. V, p. 151.
1♂, 1♀, 1 imm. Common.

25. AETHOPYGA SIPARAJA (Horsf.)
3♂. Common in open wastes covered with low shrubs.

26. CYRTOSTOMUS PECTORALIS (Horsf.)
Cinnyris pectoralis (Horsf.) *Hartert, tom. cit.* p. 550.
7♂, 3♀.
Very abundant on the sea shore.

27. LEPTOCOMA HASSELTI (Temm.)
Cinnyris hasselti (Temm.) *Hartert, tom. cit.* p. 550.
6♂, 1♀. Very common, as the preceding species.

28. ANTHREPTES MALACCENSIS (Scop).
Anthreptes malaccensis (Scop.) *Hartert, tom. cit.* p. 550.
2♀. In the coconut palms. Rare.

29. DICAEUM CRUENTATUM (Linn.)
Antea, vol. V, p. 152.
1♂, 1♀. Not common.

30. DICAEUM TRIGONOSTIGMA (Scop.)
Dicaeum trigonostigma (Scop.) *Hartert, tom. cit.* p. 550.
3♂. Common in small trees in scrub.

IX. ON A NEW RACE OF CALLOSCIURUS VITTATUS (RAFFLES) FROM SINGAPORE ISLAND.

By H. C. Robinson, *C.M.Z.S.*

CALLOSCIURUS VITTATUS SINGAPURENSIS, *subsp. nov.*

Type:—Adult female (skin and skull), Federated Malay States Museums, No. 1747/08, collected at Changi, north-east corner of Singapore Island, on July 27th, 1908, by H. C. Robinson and E. Seimund.

Characters:—Very closely related to *Sciurus peninsularis*, Miller* from the north bank of the Endau River, Eastern Pahang, but differing from the race in having the light element in the speckling of the upper surface, more ochraceous ferruginous and less olivaceous, the undersurface more ferruginous, less tawny. From *Sciurus vittatus subluteus*,† Thos. and Wrought., from South East Johore; it is at once separated by its noticeably brighter colouration on the belly and darker tail and from *Sc. v. nesiotes*,‡ Thos. and Wrought., by its broader and more clearly defined lateral black stripe. The absence of a clear red pencil to the tail beneath at once distinguishes from *Sc. v. miniatus*,§ Miller, of the Peninsula mainland from Trang to North Johore.

Measurements:—External measurements of the type taken in the flesh: head and body, 207; tail, 186; hindfoot, 47; ear, 17 mm.

Average and extremes of eight specimens: head and body, 203.5 (193–209); tail 193.8 (178–224); hindfoot, 46.1 (43–47); ear, 15.9 (15.5–17mm.).

Cranial measurements of type. Greatest length, 51.9; condylo-basilar length, 44.1; diastema, 11.1; zygomatic breadth, 31.1; median length of nasals 15.6; maxillary tooth row, including pm^3 10.2mm.

Average and extremes of eight specimens: greatest length, 50.6 (49.2–51.9); condylo-basilar length, 43.0 (41.8–44.1); diastema, 11.4 (10.8–12.0); maxillary tooth row including pm^3 10.0 (9.9–10.2).

Specimens examined:—Eight, all from the type locality.

Remarks:—Recent workers have included this form in *Sc. vittatus peninsularis* (Miller) which as now restricted is confined to a comparatively small area in Southern Pahang and Eastern Johore.

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* Smithsonian Misc. Coll. vol. 45, p. 11 (1903)

† Journ. Fed. Malay. States Mus. iv. p. 116 (1909)

‡ Journ. Fed. Malay States Mus. iv. p. 115 (1909)

§ Proc. Acad. Sci. Washington, ii. p. 79 (1900).

Measurements (in Millimetres) of **Callosciurus vittatus singapurensis.**

	Sex	Head and Body.	Tail.	Hind-foot.	Ear.	Skull. Greatest length.	Condylo-basilar length.	Diastema	Zygomatic breadth	Median nasal length.	Upper tooth row.	Condition of teeth.	F.M.S No.	Remarks.
Changi, N. E. Singapore Id.	♀	204	178	44	15	50.3	42.3	11.2	29.6	14.5	9.9	worn	1741/08	Adult
,, ,,	♀	201	184	47	15.5	51.3	43.2	11.8	30.3	15.3	10.0	Sl. ,,	1744/08	,,
,, ,,	♀	201	184	47	15.5	50.1	42.0	11.0	30.7	15.1	10.0	Ml. ,,	1745/08	,,
,, ,,	♀	193	184	47	16	49.2	41.8	10.8	29.7	14.2	10.0	Un ,,	1746/08	Sub-Adult
,, ,,	♀	207	186	47	17	51.9	44.1	11.1	31.1	15.6	10.2	,,	1747/08	Adult Type.
,, ,,	♂	203	212	43	16	51.1	43.6	12.0	31.8	15.8	10.0	Ml. ,,	368/12	,, N.C.M. *
,, ,,	♀	209	198	47	17	50.8	43.8	11.2	30.3	15.2	9.9	Sl. ,,	370/12	,, ,,
Bukit Timah, Singapore Id.	♀	210	224	47	15	50.0	43.0	11.8	31.7	15.0	10.0	Sl. ,,	2100/08	,,

* Native collectors' skin measurements

X. NOTES ON THE SAKAI OF THE KORBU RIVER AND OF THE ULU KINTA.

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In February 1916, I started from Sungei Siput on an expedition to the Korbu River (or Kerbau), intending, if everything was favourable, to pass from its headwaters to the Kinta River, and to return, via the Kinta Valley, to Tanjong Rambutan.

Sakai coolies were unobtainable; so not wishing to take Malays, even if I could get them, as they always welcome every opportunity of plundering the Sakai, I finally hired three elephants, with drivers, to take my baggage to Kuala Larek on the Korbu. Between Jalong and that place, I hoped to be able to recruit Sakai coolies, as the Penghulu of Sungei Siput told me that he thought that I should be able to obtain them. Turning off the main road at Plang we followed the elephant track which runs from that place to Jalong. This is much longer than the bridle-path, a distance of only about ten miles. We reached Jalong on the second day from Sungei Siput, passing two Sakai settlements on the first day, one near the Krodah River, and another between the Krodah (or Kerdah) and Sungei Siput. I saw one or two men from them and they seemed very much civilised, but I did not visit their houses. On our arrival at Jalong, where there is a loading stage for elephants, we pushed on for about another mile and a half to a Sakai settlement called Simpang, which is situated not far above Kuala Lengkar. Here I tried to obtain coolies from Toh Intan, the headman, but he pointed out that, besides himself, there were only five men in his village at the time, and that two of these were suffering from ulcers, and were unfit for work. Questioned about the possibility of getting men at Kuala Larek, he told me that there were none there except his father and one youth. He further stated that a great many Sakai had died in the district recently. In spite of this, I resolved to go on to Kuala Larek on the morrow to see for myself if what he told me was true. We therefore started fairly early the next morning. On the way we passed two Sakai clearings, one with ripe padi standing in it, the other with felled trees still lying everywhere. Both these had, so Toh Intan, who came with us, informed me, been deserted owing to the death of the head of the house. Arrived at Kuala Larek, I found that Toh Intan's information was perfectly correct; so there remained nothing to do but to return to Sungei Siput. Our first day, on the way back again, took us to Simpang, where we had rather an exciting night, as a herd of wild elephants broke into the Sakais' padi crops and, after destroying nearly the whole of them, were driven off with considerable difficulty. From Simpang

we walked, on the next day, to Sungei Siput, via the bridle-path, leaving the elephants with the baggage to follow the track, which we had made use of before. These animals arrived at Sungei Siput at about 4 p.m. on the day after.

There is little to note with regard to the few Sakai we met on the Korbu River. Traces of Negrito admixture could be detected in some individuals, both in their features and in the character of their hair. In Toh Intan's village there seemed to be very few articles which could be classed as distinctively Sakai, and the only specimen of much interest that I purchased was a heavy carved wooden comb, of a type which seems to be only used by the Kinta and Korbu aborigines. The other objects that I bought were a long mat and two or three carrying baskets. There were no blow-pipes in the settlement. According to Toh Intan, his people speak the same dialect as the Sakai of the Plus and Kinta Rivers. With the former they are in constant contact, but they rarely have anything to do with the latter. Two of the houses in the settlement were of a curious type and were turreted, one bearing two the other a single erection of this kind. On the former, one turret was ornamented with a curiously carved decoration made of small pieces of wood, the other, as was the first, was roofed over at the top with a piece of board, and had lost its ornament. On the second house the single turret was crowned by an old kerosine tin, filled with earth, in which plants of some kind were growing. Toh Intan's own house was well built, and consisted of a large central sleeping room, with a cook-house adjoining it on one side, and a lean-to building, which was not raised from the ground, on the other.

On leaving Sungei Siput I proceeded to Tanjong Rambutan, where, after some trouble, I procured a gang of Sakai coolies. Starting with these, we followed Messrs. Osborne & Chappel's pipe-line as far as the dam, and then the course of the Kinta River. Our destination was a Sakai settlement close to Bukit Daroh, which lies on the south bank of the Kinta.

The maps of the districts are, it would seem, exceedingly incorrect but on the way we passed the mouths of the following rivers, the Proh, the Termin, the Takor, the Penoh, the Liang and the Pedang, as well as several other streams, most of them very small, whose names I have not thought necessary to record. Our first day's journey (we did not start until nearly midday owing to the late arrival of our coolies and to their insufficient numbers) took us to a little way above the pipe-line dam. On the second we camped by the edge of a deep pool in the Kinta River, which goes by the name of Lubok Singet, somewhere between Kuala Termin and the mouth of the Penoh River; and on the third night, we slept at Kuala Liang. On the fourth day, we arrived at Bukit Daroh, and might have reached there on the third, had the Sakai guide not led me to believe that it was a long way further on. A mountain, which the Sakai told me was Gunong Semawak, was visible

from the top of their clearing. A large hill, called Gunong Takai, was in view across the river, being nearer to us than Gunong Semawak. I do not know if this is the same as Gunong Takor (3,850) of the maps, but we passed the Takor River, which is not shown in them, on the second day out from Tanjong Rambutan. This joins the Kinta close to the mouth of the Termin, but on the opposite side.

The settlement at Bukit Daroh proved to be a single house of the communal type, about forty feet in length, by fifteen feet in breadth. The height of the floor from the earth was, at its maximum (the house was built on sloping ground), twelve feet. The building was supported on three somewhat irregular rows of posts, many of which were of but small diameter. The greatest height of the house from ground level was about twenty feet; there thus being only eight feet between the floor and the roof in the central line of the building; and much less at the sides owing to the slope of the thatch. The regular inhabitants comprised four families, of some fifteen to twenty individuals in all, but they received frequent visits from other Sakai, who stopped a night or two with them. Sleeping platforms covered with sheet-bamboo were ranged along the walls, the interior not being divided off into rooms, and, between opposite benches, fires were kindled on fireplaces of dried mud. Of these there were four, the burning logs being disposed radially on them so that it was only necessary to push the ends of the logs with the foot in order to replenish the fire. The sleeping patforms and the hearths took up so much room that it was necessary to step over each fire in passing from end to end of the house. During the day-time the fires were allowed to die out, or only kept smouldering; but, at about six o'clock in the evening, when it began to get cold (the clearing was situated at a height of about two thousand feet above sea-level), the logs were pushed together and the fire made up. At the time of my visit, which extended over ten days, the Sakai did not seem to be very actively engaged in agricultural work, though they were, according to what they told me, preparing a fresh clearing. That from which the crops—chiefly of tapioca—were then being used was situated at the top of the hill, on the side of which the house stood. In the morning some of the women used to go out to dig tapioca roots, and they returned late in the day bringing these, and occasionally some pumpkins. The latter were cut up and boiled in a large iron cauldron, the resulting broth or soup being first drunk in cocoanut shells and the pieces of the fruit then eaten separately. The tapioca roots were usually roasted in the embers of the fires. One day the Sakai were fortunate enough to kill a young Sambhur stag in a spring-spear trap. The meat was hacked from the body in lumps, and rammed down into joints of green bamboo, which were placed in the fire at an angle of about thirty degrees with their mouths projecting from the fire and supported on a stone. The deer having been killed near the river, which lay far

below the house, the majority of the men who went to help in cutting up the animal took the opportunity of having a bath, of which they were much in need.

Drinking water was drawn from a small spring, which was at a considerable distance from the house, but not quite so far away as the river. Bamboo-joints were used as water-vessels.

At night conversation, often in a loud tone of voice, was kept up till quite a late hour. During the heat of the day the majority of the people lay off work and went to sleep.

The Prah fruit is an article of diet of which the Sakai are very fond. This fruit is sometimes roasted whole in the fire, and when so treated is not unpleasant to eat, having a flavour something like a Brazil-nut. It is also beaten to a flour in a large wooden mortar of exactly the same type as the Malay *lesong*. The fruits when freshly gathered are said to be poisonous to a certain extent, and are soaked in water before use. Noting that several side-paths branched off from the main Sakai track, which follows the Kinta River, I enquired where these went. My coolies replied that they led to parts of the jungle where there were numbers of Prah trees, and that they built small huts near the trees in which they stored the ripe fruit. These store-houses, except at the fruit season, were only visited occasionally to obtain fresh supplies or to see if rats were eating their contents. If it was found that there were many rats about, snares were set for a night or so in order to trap them for food.

Some cobs of Indian corn, most of them blackened by smoke, were hung up under the thatch in the communal house at Bukit Daroh. These were reserved for seed purposes, as were also some dried tobacco-plant fruits. The Sakai explained to me that they had no tobacco growing at the time of my visit owing to their clearing being old, for tobacco only grows well on fresh soil.

With regard to their appearance the people of the Ulu Kinta in their features showed little, if any, traces of Negrito admixture. Curly, but not woolly, hair was to be observed in some individuals. The septum of the nose was bored in both sexes, but by no means every native had been operated upon.

Tattooing is practised, but not to any great extent; the only type of marking of this kind which I saw (on both men and women), being a single line running perpendicularly from the top of the forehead to either the root or the point of the nose.

Face-painting in simple designs was much in favour among the women, while some of the patterns were made by applying a kind of plant juice with stamps made of tortoise-shell.

I saw very few blow-pipes in the hands of the Kinta Sakai, not more than four altogether, and of these only two

were made locally. Of the other two, one had been purchased from a "Kampong Kelantan man" (on the Kelantan border?), the other from a wandering abougine from some unknown district. The weapons, however, presented some peculiarities worth noting, as they were, roughly speaking, intermediate in type between those used by the main branches of the Northern and Central Sakai. All the blow-pipes had the flat-ended mouthpiece of the Central Sakai, but the inner tube in three out of the four was a single internode of bamboo (Northern Sakai type); in the remaining specimen, however, which was locally made, it consisted of two internodes placed end to end and fastened in the usual manner employed by the Central Sakai. The only locally made quiver that I saw had a soft pandanus cover of the type so common in the Batang District of Perak. The quiver belonging to the "Kampong Kelantan" blow-pipe had a hard cover of the Northern Sakai variety.

The two poisons used on the blow-pipe darts are Ipoh and Broyal*, the latter which is obtained from a liana, is only used for small game, and is, the Sakai told me, much less effective than Ipoh. Darts treated with Broyal are not notched above the poison (so that the dart joint may break off in the wound); those treated with Ipoh are.

Spears, with a bamboo blade and a wooden shaft, are used in spring-traps, and a number of these were placed across the rafters of the communal house at Bukit Daroh. With the exception of the blow-pipe, iron-bladed spears of Malay manufacture, krises, parangs, and daggers of the kind called *tumbuk lada* and *badek* were the only weapons in use.

On questioning the Sakai, they said they had heard of the bow, which is used by the Negritos and the hill-tribes of the Piah and Temengoh Valleys, but had never seen a specimen.

A fair number of dogs are kept by the Kinta aborigines, while generally speaking they are well treated and a good deal of affection shown to them.

Of the objects that I collected the most interesting were the face-paint stamps, and wooden combs of various types, some of which seem to be peculiar to the district, and are almost exactly similar to those figured by De Morgan in his "Negritos de la Presqu'ile Malaise."

Two holders used for fish-bait, consisting of open bamboo receptacles, with a spike from their bases (this spike being for securing the holder on the left side of the body by slipping it into the girdle), are of a kind also figured by de Morgan with the description "Boites à amorces de pêche," and by Skeat (Pagan Races, vol. I, page 471) as "Bamboo vessels used by Perak Sakai (Hale collection)." I also procured several specimens of seed necklaces, carrying baskets, bark-cloth, headbands (ornamented with patterns), *akar batu* girdles and

* The Prual of Wray (Coptosapella flavescens)? vide "Pagan Races" vol, II, page 303.

necklets, flutes,* and rice bags, but they do not call for special remark, being similar to those manufactured by other tribes. The coloured crown-like head-dresses, made of sweet smelling leaves and fibres, worn by some of the men are, perhaps, worthy of note, as they resemble those made by the Sakai of the Piah and Temengoh Valleys.

Beliefs and Customs.

I could obtain no evidence that the Sakai of the Kinta Valley have any theory of a Supreme Being, nor was I able to find out that they had any legends accounting for the various phenomena of nature, as have most savage tribes, but I give below such details as I learnt with regard to their beliefs and customs.

Work Tabus.

It is according to Udah, my informant, not allowable to do work in the clearing when :—

1. The moon falls at the rising of the sun—three days tabu.
2. The moon is at the full and looks swelled—three days tabu. (It is said to be about to give birth).
3. The moon is beginning to decline and is "notched like a reaping knife"—three days tabu. (It has given birth).
4. The old moon is about to die—(two days tabu).
5. The new moon appears—(two days tabu).

If work is done when the new moon is about to die, somebody in the house will die. If work is done at the new moon, pigs will come and damage the crops.

It is tabu to cut rattans at the edge of a clearing in which padi is planted.

Tabus connected with food.

The flesh of the following animals is forbidden to women and it is thought that the breaking of the tabu would cause the children to suffer from convulsions. Some laxity of observance, however, with regard to these customs seems to be creeping in; and it is a matter for the woman herself whether she observes all, or any, of the prohibitions.

The Muntjac.

The species of tortoise called *Baning* by the Malays.

The Mouse deer.

The Rusa deer (tabu not observed by all women).

The Fowl.

It is not customary for the Sakai to eat fowls reared in their own village, though they will consume birds bought from outsiders, provided that they have not been kept in the village for a day or two. They told me that the reason for this was

* The nose-flute does not seem to be known in this district.

that they had pity on animals which they had brought up themselves. Double bananas are not eaten by the women, since they think that to do so would cause them to have twins. Twins do not seem to be welcomed, the reason being, the Sakai said, that one of them always died.

Peppers may not be eaten with the flesh of birds or animals, as, if this is done, traps set in the jungle will catch no game. This prohibition does not, however, apply to fish.

Among the Kinta Sakai it is tabu for the usual names of certain animals to be mentioned while their flesh is being eaten. Curiously enough, it is not forbidden to mention their names while out hunting them. Below I give the English, ordinary Sakai, and Sakai tabu names of some of these:—

English Name.	Ordinary Sakai Name.	Tabu Name.
Bamboo rat.	*Takator or Dekak.*	*Nyam awin* (i.e. bamboo meat).
Fowl.	*Manuk.*	*Chep* (bird).
Brok monkey.	*Dok or Dog.*	*Hoi-wet or Hoi-ket* (said to mean "no tail.")
A Monkey (Hylobates sp.)	*Senalu.*	*Bersentak* (i.e. the tailed one).
Muntjac.	*Jet.*	*Penyel* (said to mean "red.")
Mouse deer.	*Bichok.*	*Reluk* (said to mean "big eyes.")
Sambhur.	*Tata-jeruk.*	*Nyam.* (meat. Equivalent to the Malay word *lauk*).
Wild pig.	*Heyhak.*	*Amboit.*
Porcupine.	*Chekos.*	*Berjalak* (i.e. the thorny one).
Bear.	*Ta'pus.*	*Mes-mat* (small eyes).
Rhinoceros.	*Tata-guru.*	*Tata-menu.*

If a man, in cutting up the flesh of an animal, which has a tabu name, wounds his hand, he must not leave the house for four days, or he will be eaten by a tiger.

The Ulu Kinta Sakai, as do the Temengoh people, believe in the bad luck which will pursue anyone who goes out with an unsatisfied craving of any kind, and they also apply to this belief the word *shelentap* or *shalantap*, which is difficult to translate, but is seemingly equivalent to the Malay *kemputan*. One Sakai with whom I had been talking about this matter, having been given a couple of biscuits shortly afterwards, went round among his companions, who were squatting near my tent, and, chiefly, I think, with the idea of giving me a practical

demonstration, broke off a bit of biscuit for each man, saying as he gave it to him "*shalantap*." Apart from greediness, I am inclined to believe that some idea of this kind may be the reason why, if one Sakai is given something to eat, all the others expect to receive a little too, even if they see that your stock of that particular article is almost exhausted.

I could not find out that the Kinta Sakai have any name for fish in general, but the word *kak* (commonly used for "fish" by other tribes) is applied to the *Tengas*, about the only species which is common in the head waters of the Kinta. The *Sebarau*, the *Haruan* and others are not recognised as *kak*. While fishing for *Tengas*, or while it is being eaten, its name *kak* must not be mentioned, but the Malay word *ikan* (fish) used instead.

While tabu food of any kind is being eaten, lice may not be cracked, nor hair burnt in the fire. The breaking of this prohibition would entail the penalty of the offender being seized by a tiger.

Other Tabus.

It is tabu for a man, on leaving a friend's house, to promise to return to sleep there, and then neglect to do so. If he does not keep his promise, his friend will be taken by a tiger.

It is tabu for a man to stop behind after promising some friends to go on a journey with them. If he does so, his friends will fall ill by the way.

It is forbidden to a man to mention the names of his father, his mother, or his mother-in-law. A mother-in-law may not be spoken to, touched or even passed by, unless at a distance. Similarly a woman must avoid her father-in-law.

Marriage Customs.

I was given to understand that first cousins might not marry, but that first cousins once removed might do so. Two wives were said to be allowable, but not three. A man usually takes a wife from another settlement. After marriage the man lives with his wife's family for some time.

Burial Customs.

Though I had no opportunity of visiting a Sakai interment, some rather interesting information with regard to burial customs was given me by the headman, Udah. He told me that graves were dug to about a depth of a foot more than the height of a sitting figure (so that the spirit or corpse may be able to sit up); and that the body is placed at the bottom of the excavation, lying with the head in the direction in which it was when death occurred, the orientation of the grave being of course such as to render this possible. The hole is covered in with a roofing, which is almost on a level with the surface of the ground, while the earth from the excavation is piled up on this, the mound being topped by a hut of some

sort. Food is placed at the grave, and a fire is lit there for seven consecutive mornings. The belongings of the deceased are placed either in or on the grave, and are purposely damaged (probably in order to set free the souls of the articles for the dead man's use) before so disposing of them; a blow-pipe for instance being broken in the middle, and a dart-quiver split down one side. I asked Udah for an explanation of this custom, and he replied, that if they put an adze in good condition on the grave, it would look bent or crooked to the ghost of the dead man, but if they put one that was bent or broken there, it appeared straight to the spirit.

A death necessitates the desertion of the settlement, but the Sakai are not afraid to return to the clearing in the daytime to get the produce of any crops which may be growing there.

Vocabularies.

I give below a vocabulary obtained from a Sakai of the Ulu Kinta; and with it, for purposes of comparison, another taken by myself in 1915 from a "Hill Sakai" of the Temengoh District. With regard to the Kinta vocabulary, it is rather curious that, while I could obtain no word for "animal," there is one, *tata*, which is used of large animals only. Furthermore, two of the animals to which this word is applied have names which denote their peculiarities. Thus the Sambhur is called *Tata-jeruk*, *jeruk* meaning "long" or "far," from the fact that it has long legs, while the Bear, which the Sakai tell me is very fond of tepus fruits, is named *Ta'pus* or *Ta'apus*, a contraction for *Tata'tepus*. There is, I find, on comparing the two vocabularies, some confusion in the terms employed for denoting various relationships. For instance, the words given to me by the Ulu Kinta Sakai for "husband" and "wife" were *touh** and *leh*, while in the Ulu Temengoh vocabulary the order is reversed. I have entirely omitted several relationship terms, in which there seem to be inconsistencies. Sen-oi is the word used by the Kinta aborigines to denote men in general (homines) and they gave me the following examples of its use:—

Sen-oi Gop, A Malay.
Sen-oi Begyek, An European.
Sen-oi Beg, A Sakai.

English.	*Malay.*	*Sakai U. Kinta.*	*Sakai Bukit (U. Temengoh.)*
Head	... Kepala	... Knie	... Koie
Ear	... Telinga	... Gentok	... Gentog
Eye	... Mata	... Mat	... Mat
Nose	... Hidong	... Mühr	... Muh
Nostril	... Lubang hidong.	Lubang muhr	Umok muh

* In the comparative vocabulary "Pagan Races" *tou* is given as a word for "Male" obtained from a Tanjong Rambutan Sakai.

English.	*Malay.*	*Sakai U. Kinta.*	*Sakai Bukit (U. Temengoh.)*
Cheek	Pipi	Kapok	Kapok
Mouth	Mulut	Nyark	Nyug
Lip	Bibir	Sentor	Leutag
Tongue	Lidah	Lentak	Leheng
Tooth	Gigi	Moin	Lemoin
Chin	Dagu	Chakak	Yakak
Neck	Lihir	Geloh	Geloh
Throat	Tengkok	Tangun	Tangurn
Shoulder	Bahu	Yung	Pog
Arm	Lengan	Sapal	Sapal
Elbow	Siku	Kanyong	Kanyong
Hand	Tangan	Tīg	Ting
Thumb	Ibu tangan	Tabok tīg	Tabok
Finger	Jari	Jari	Jari
Finger-nail	Kuku	Cheros	Chendros
Thigh	Paha	Beluk	Blik
Knee	Lutut	Karol	Karol
Shin	Tulang kering	Kemong	Kemong
Foot	Kaki	Juk	Kapar
Heel	Tumit	Deldul	Deldul
Sole	Tapak kaki	Tapar juk	Juk tapar
Toe	Jari kaki	Jari juk	Juk
Breast	Dada	Dar-heuk	Dadak
Back	Belakang	Keruk	Kreuk
Heart	Jantong hati	Hup	Bod
Liver	Hati	Hinum	Hug
Stomach	Perut	Eg	Aig
Navel	Pusat	Panik	Panig
Intestines	Isi perut	.....	Wak
Blood	Darah	Lot	Lorn
Bone	Tulang	Tunleng	Jeharng
Skin	Kulit	Sempok	Sempok
Hair	Rambut	Suk	Shug
Old	Tua	Tatah	Tatak, Kebid
Young	Muda	Litong	Patun
Fat	Gemok	Menung	Chekeng
Thin	Kurus	Suak	Na-semog
Hot	Panas	Būt	Būd
Cold	Sejok	Dekat	Dekad
Blind	Buta	M	Hoi-chung
Deaf	Tuli	M	Hoi ta begentog (deaf man).
Dumb	Bisu	M	Langau
Fever	Demam	Gik	Najeh
Itch	Kurap, Kudis	Gas, kudil	Gas, choid
Vomit	Muntah	Kok	Koh
Gripes	Sakit perut	Pedik eg	Kab-ig
Diarrhœa	Chirit	Imharp	Naham

M = Malay word used.

English.	*Malay.*	*Sakai U. Kinta.*	*Sakai Bukit (U. Temengoh).*
Cough ...	Batok ...	Suwad ...	Sengod
Dead ...	Mati ...	Kebus ...	Kebus
Putrid ...	Busok ...	Soh ...	Sashok
Father ...	Bapa ...	.....	Beuk
Mother ...	Ibu ...	Boh ..	Nyok
Husband ...	Laki suami ...	Touh ...	.....
Wife ...	Bini ...	Leh ...	.....
Male ...	Jantan ...	Baber ...	Baber
Female ...	Betina ...	Babok ...	Babok
Man ...	Orang laki-laki.	Touh ...	.....
Women ...	Orang perempuan.	Babok ...	Babok
Person ...	Orang ...	Sen-oi ...	Senoi
Son ...	Anak laki-laki	Kuod baber ...	Kungis
Daughter ...	Anak perempuan.	Kuod babok ...	Kuod babok
Child ...	Kanak kanak	Boug (*f*) atong (*m*)	Kuod
Boy ...	Budak laki laki	Atong ...	Kungis
Girl ...	Budak perempuan.	Aleh ...	Kuod babok
Maiden ...	Anak dara ...	Menaleh ...	Kumon
Elder brother	Abang ...	Keluh ...	Kelok
Elephant ...	Gajah ...	Tata-gas ...	Tangel
Rhinoceros ...	Badak ...	Tata-guru ...	Hagap
Tapir ...	Tenok, badak tampong.	.....	Barong
Gaur ...	Seladang ...	Sapi ? ...	Sapi
Bear ...	Beruang ...	Ta-apus ...	Kauib
Deer ...	Rusa ...	Tata-jeruk ...	Seig
Chevrotain ...	Napoh, plandok.	Napoh, bichok	Bechog
Wild pig ...	Babi hutan ...	Heykak ...	Amboid
Porcupine ...	Landak ...	Chekos ...	Lanug
Dog ...	Anjing ...	Chuok ...	Chuok
Wild dog ..	Anjing serigala	Chuok menghok.	Mengkong
Tiger ...	Harimau ...	Marmuk ...	Mamu
Black panther	Harimau kumbang.	Marmukr ...	Baling
Wild cat ...	Kuching hutan	Semagar ...	Jet-ung
Cat ...	Kuching ...	Kuching ...	Had kuching, cheuchog.
Bear-cat ...	Benturong ...	.....	Tenuk
Civet-cat ...	Musang ...	Rengher ...	Kenrog
Large squirrel	Tupai nanding,kerewak.	Kraleh ...	Kedig (?)
Small squirrel	Tupai kampong.	Reugnain ...	Achoh

English.	*Malay.*	*Sakai U. Kinta.*	*Sakai Bukit (U. Temengoh.)*
Flying lemur	Kubong ..	Ampak ...	Anchong
Loris ...	Kongkang, kera duku.	Kelpem ...	Kayi
Bamboo rat ...	Dekan ...	Takat ...	Hayum
Rat ...	Tikus ...	Kedig ...	Kenon
Gibbon ...	Unka ...	.....	Legrub
Monkey ...	Lotong ...	Besik ...	Shenalu
„ ...	Kera ...	Areit ...	Jerau
„ ...	Berok ...	Dok ...	Apong
Fruit-bat ...	Keluang ...	Kaweid ...	Kaweid
Bat ...	Kelawar ...	Taper ...	Taper
Crocodile ...	Buaya ..	Bahaya ...	Buayar
Monitor-lizard	Biawak ...	Parik ...	Gre-ek
Grass-lizard ...	Bengkarong ...	Tarok ...	Payard
Flying-lizard	Chichak kubin	Hanok ...	Tarong
Land-tortoise	Kura-kura, baning.	Kura, sil, kenok	Karuak kenog
Water-tortoise	Labi-labi ...	Pa-as ...	Pa-ash
Snake ...	Ular ...	Tajuk ...	Tajuk
Python ...	Ular sawah ...	.....	Telud
Frog ...	Katak ...	Sek-nuk ...	Changkei
Fish ...	Ikan ...	Kak (?) ...	Kak
Horn ..	Tandok ...	Balok ...	Balok
Tusk of Elephant.	Gading ...	Balok (?) ...	Geneh
Tail ...	Ekor ...	Sentak ...	Sentak
Hornbill ...	Enggang ...	Tĕrūk ...	Halang
Hawk, eagle ...	Lang ...	'Hlak ..	Klang
Owl ...	Burong hantu	Huhui ..	Huhui
Egret ...	Bangau ...	.....	.....
Jungle-fowl ...	Ayam denak...	Manuk denak	Tadur, sieng
Argus-pheasant.	Kuao-kuang ...	Kuak ...	Kuang
Green-pigeon	Punai ...	Punai ...	Chechib
Crow ...	Gagak ...	Ekark ...	Agak
Kingfisher ...	Pekakak raja udang ...	Pekakak ...	Burau
Woodpecker...	Pelatok ...	Pelatok ...	Tahmar
Magpie-robin	Murai ...	Birai ...	Birai
Egg ...	Telur ...	Tap ...	Tab
Feather ...	Bulu ayam ...	Sentol manuk	Shog manok
Beak ...	Paroh ...	Balok ...	Balog, chenong.
Ant ...	Semut ...	Bet ...	Kabid
Red ant ...	Kerungga ...	Lauer ...	Garud
White ant ...	Anai-anai ...	Bubok (?) ...	Kated
Bee ...	Lebah ...	Padou ...	Padou
Honey ...	Ayer madu ...	Dengkui ...	Dingkui
Wax ...	Lilin ...	Kaluoi ...	Shud
Hornet ...	Terbuan ...	Jenjak ...	Langir

English.	*Malay.*	*Sakai U. Kinta.*	*Sakai Bukit (U. Temengoh).*
Wasp	Penyengat	Rejau, huk	Jenjug
Fly	Lalat	Ruoi	Ruoi
Black scorpion	Kala	Mangai	Jungei
Small scorpion	Kala jengking	Slerdor	Engchesh
Centipede	Lipan	Kehep	Keheb
Millipede	Sepak bulan	Tanglung	Talei
Cockroach	Lipas	Garip, ser	Chelapog
Spider	Labah-labah	Geng-ong	Krelbol
Cocoanut beetle.	Kumbang	Gintus	Tawing
Mosquito	Nyamok	Sebik	Kebok
Tree	Pokok kayu	Bo'jehuk	Jehuk
Bough	Dahan	Chempark jehuk.	Tabak
Root	Akar pokok	Latong	Tengteng
Leaf	Daun Kayu	Selat jehuk	Shelak
Flower	Bunga	Bungar	M
Fruit	Buah kayu	Keburk jehuk	Kebuk
Fungus	Chenduan	Buhr	Bur (kuling, fungus on tree trunks)
Bamboo	Buloh, aur	Awin kelol, awin temark (near water) awin suor (B. wrayi).	Awin
Rattan	Rotan	Tali	Tali
Thorn	Duri	Jalak	Jalak
Rice	Padi	Bah	Bah
,,	Beras	Cheroi	Beras, kok.
,,	Nasi	Chanak	Chenin
Banana	Pisang	Teluie	Telui
Areca-nut	Pinang	Jerok	M
Durian	Durian	Sempak	Penrug
Tampoi	Tampui	Tampoie	Tampoi
Rambutan	Rambutan	Susuk	Lichag
Sireh-leaf	Daun sireh	Sireh	Sireh biad
Screw-palm	Mengkuang	Salek	Budap
Terap-tree	Terap	Hah-uk	Ued
Forest	Hutan	Mabek	Cherog
Yam	Ubi kayu	Kuoi	Had ubi
,,	Keledek	Seung	Gak
,,	Keladi	Gong	Berak
To walk	Berjalan	Chep-chib	Chib
,, run	Lari	Dedük	Dadok
,, stand	Berdiri	Tetut	Tud
,, sit	Dudok	Gel-gul	Gul
,, lie down	Berbaring	M'adat	Wog
,, sleep	Tidor	Sek-lok	Shelog

M = Malay word used.

English.	*Malay.*	*Sakai U. Kinta.*	*Sakai Bukit. (U. Temengoh).*
To snore	... Berdengkor	.. Hinum	... Kenekug
,, jump	... Melompat	... M	... Panchar
,, climb	... Menjat	... Ek-oit	... Oig
,, hold	... Pegang	... Kuop	... Kwob
,, lift up	... Augkat	... Beuk	... Angkid
,, throw	... Lempar, lontor.	?	Pekah
,, scratch	... Garu	... Gesh-gish	... Gish
,, spit	... Ludah	... Gentok	... Getok
,, bite	... Gigit	... Nakap, kap	... Kop
,, pinch	... Chubit	... Pinyet	... Cheket
,, wash	... Basoh	... Sūd	... Re-ed
,, bathe	... Mandi	... Mahmud, mehmu.	Mamuh
,, cook	... Memasak	... Meched, berched.	Chet
,, eat	... Makan	.. Chechak	... Chak
,, drink	... Minum	... Imoh	... Ong
,, chew	... Mamah	... Beus	... Die
,, fly	... Terbang	... Nahek	... Heng
Sun	... Mata hari	... Mat-ish	... Mad-ish
Moon	... Bulan	... Gechek	... Gechek
Star	... Bintang	... Peloie	... Perloie
Cloud	... Awan	... Ol	... Sagub
Mountain	... Gunong	... Jelmol	... Jelmol
Hill	... Bukit	... Tenuh	... Gerbok
Day	... Siang	... Nayah	... Jemiah
Night	... Malam	... Laiyek	... Laiëg
Thunder	... Guroh, petir	... Brehelak	... Engkup
Wind	... Angin	... Nahul	... Jerop
Rain	... Hujan	... Natur	... Natur
Storm	... Ribut	... Sagup	... Kabut
Fire	... Api	... Us	... Os
Water	... Ayer	... Ong	... Teu
Smoke	... Asap	... Per-ut	... Pengud
One	... Satu	... Nek	... Neh (do-nek 1st)
Two	... Dua	... Nar	... Nar (do-nar (2nd)
Three	... Tiga	... Nek	... Nek
Four	... Ampat	... M	... Lebeh
Five	... Lima	... M	... Tabok
Ashes	... Abu	... M	... Ual
Salt	... Garam	... M	... Empoid
Tobacco	... Tembakau	... Akau	... Akau
Stone	... Batu	... M	... M
Earth	... Tanah	... Teh	... Teh
A clearing	... Ladang	... Slai	... Shelai

M = Malay word used.

English.	*Malay.*	*Sakai U. Kinta.*	*Sakai Bukit (U. Temengoh.)*
House	Rumah, pondok.	Dik, dingrup	Dig
Roof	Atap rumah	Kenrob, dik	Kenrob
Chopper	Parang	Woit	Joh-oid
Axe	Kapak, beliong.	M	Kapok, jek
Knife	Pisau	M	?
Cloth	Kain	Abat	Abat
Girdle	Gendit, kendit	Gendit	?
Spear	Lembing	Bulus	Bulus
Blow-pipe	Sumpitan	Blau	Blau
Mouthpiece	Pngkal sumpitan.	Tebog blau	Tebul blau
Muzzle	Mata sumpitan.	Penisuis blau	Shoi
Quiver	Tabong bekas damak.	Luk	Luk
Quiver cords	Tali tabong	Tig luk	Chenrai luk
Dart	Damak	Rok	Shigar
Point of dart	Mata damak	Soie Rok	Shoi shigar
Butt of dart	Pangkal damak.	Basok rok	Pashug shigar
Dart holder	Sarong damak	Saret rok	Not used, sometimes small tubes of darts
Poison	Ipoh	Pelai menut	Dog

M = Malay word used

XI. ON A NEW RACE OF CALLOSCIURUS ATRODORSALIS (GRAY) FROM NORTH SIAM.

By H. C. Robinson & R. C. Wroughton.

Callosciurus atrodorsalis zimmeensis, *subsp. nov.*

Type: Adult female (skin and skull), British Museum No. 9, 10, 11, 20. Collected at Chiengmai, North Siam, on 12th April 1908 by Mr. T. H. Lyle and presented to the National Museum. Collector's Number 245.

Diagnosis. A local form of *C. atridorsalis*, in which the dorsal patch is almost obsolete and the rufous undersurface broken by a patch, coloured like the back, on the throat, chest and a narrowing area of the abdomen.

Colour. General colour above the usual olivaceous grizzle, the dorsal black patch almost obsolete; below the throat, chest and a wedged shaped area, extending to at least half the length of the abodomen coloured like the flanks, the remainder nearly hazel. Face like back with no trace of the bright colouring so characteristic of typical *C. a. atrodorsalis*. Hands and feet finely grizzled, at least as dark as the back. Tail rather as in *C. caniceps concolor* than in *C. atrodorsalis*, i.e. the fulvous shading of the hairs so common in the latter almost entirely absent in this form.

Dimensions. External dimensions of the type, taken in the flesh; head and body, 217; tail, 205; hindfoot, 49; ear, 21mm.

Skull: Greatest length, 55; basilar length, 42; zygomatic breadth, 32; nasals 17; diastema, 12; upper-molar series, 10.6mm.

Remarks. A fine series of 12 specimens, all with one exception taken between 700 and 1,000 feet in altitude, is quite constant in showing the obsolescence of the black dorsal patch and equally so in the encroachment of the dorsal colouring on the throat, chest and anterior abdomen. An individual taken at Muang Pai on the Salwin watershed shows intergradation with other forms from British Burma.

XII. ON TWO LITTLE-KNOWN RATS FROM WESTERN JAVA.

By H. C. Robinson, *C.M.Z.S.*

Owing to the fact that the work of Mr. Shortridge, the only modern collector of mammals in Java (*vide* P.Z.S. 1909 (i), pp. 371, et seq.,) was mainly confined to the lowlands and to cultivated districts, but little trapping having apparently been carried out in heavy jungle our knowledge of the murine fauna of Java, with the exception of the forms parasitic on man is almost entirely derived from scattered notices by Dr. Jentink in the "Notes of the Leyden Museum," while his descriptions being generally founded on ancient and imperfect specimens and not conforming to modern standards, render it somewhat difficult to identify the species intended by him.

During a recent visit to Java I succeeded in the course of a month's stay on the Gedeh Volcano in the Preanger Regencies, at a height of from 4,500 to 8,000 feet, in trapping several hundred rats, belonging to seven species, all of which, with the exception of a series of *R. concolor* obtained in the immediate vicinity of native houses were secured in primæval jungle.

Four of these species will be described in the forthcoming paper on the Mammals of our Korinchi Expedition, being closely allied to new forms from Sumatra.

The remaining two species have already been described by Jentink but I think it well to redescribe them here in view of the paucity and age of his material.

Rattus lepturus (Jent.).

Mus lepturus, Jentink, Notes Leyden Mus. ii, p. 17 (1879). ("Java" ex Temminck M.SS.)

Form slender, tail very much longer than head and body. Pelage very long, soft and woolly, entirely devoid of spines. Ear very large, rounded. Skull with small but globose bullæ. Tooth row exceptionally long, the teeth large.

Fur composed of two elements only, viz., long and very fine piles most abundant on the rump, extending almost to the nape but practically absent on the sides and the ordinary underfur, which is very long and soft, sooty grey at the base and fulvescent buff at the tip, the flanks, and sides of the neck brighter, cinnamomeous buff. Top of the head and periocular region a fine speckle of wood-brown, buff and black with grey bases, hands and feet greyish white with brown median streak: vibrissæ black, a few white at the base. Underparts pure creamy white to the base of the fur. No buff gorget or median stripe on the belly. Tail very finely ringed, slightly

pencillate at the tip, blackish at base above, whitish beneath, the distal third whitish above also. Ears extremely finely haired, almost naked.

Skull:—Except for the large size of the teeth there is nothing especially peculiar about the skull. It is lightly built and even in very aged specimens not heavily ridged, nor does it present the marked cranial flattening present in rats of the *surifer* group. Nasals are slender, pointed posteriorly and extend up to or beyond the maxillary suture. Mesopterygoid space markedly horse-shoe shaped, the palatal foramina long, extending behind the roots of the anterior molars. Ante orbital plate broad, projecting slightly forwards, zygomata slender. Bullæ small but not flattened.

Specimens examined:—Over sixty of all ages.

Measurements:—For detailed measurements see pp. 96, 97.

This pretty rat was extremely abundant on the Gedeh and Pangerango at high elevations, becoming scarce below about 5,600 feet. It was seen throughout the day and at Kandang Badak no trap remained set for more than a very few minutes.

In the crater of the Gedeh it was observed in numbers feeding on the pods of a leguminous tree (*Pithecolobium*).

Remarks:—This species belongs to a group of which the following can be stated to be members, though the section probably contains other Chinese forms regarding which we are not in a position to make any remarks. From comparison with the type the present form is closest to *R. brahma* (Thos).

1. *Mus fulvescens*, Gray, Cat. Mamm. etc. Nepal and Tibet B.M. (1), p. 18 (1846). Nepal.
2. *Epimys cha*, Wroughton, Journ. Nat. Hist. Soc. Bombay, xxiv, p. 420 (1916). Sikkim (8,800 feet.)
3. *Epimys lepcha*, Wroughton, loc. cit. supra, p. 428. Sikkim 5,350 feet.)
4. *Rattus blythi*, Kloss, Records Indian Mus. xiii, p. 8 (1917). (*Mus cinnamomeus*, Blyth nec Pictet.) Shwegyin, Tenasserim.
5. *Epimys brahma*, Thomas, Journ. Nat. Hist. Soc. Bombay, xxiii, p. 231 (1914). Anzong Valley, Mishmi Hills.

The following are more distantly related and possibly form a connecting link between this group and the *cremoriventer* section.

6. *Epimys gracilis*, Miller, Smithsonian Misc. Coll. vol. 61, p. 21 (1913). Mount Muleyit, Tenasserim.
7. *Epimys solus*, Miller, loc. cit. supra, p. 22. Pulau Terutau, W. Malay Peninsula.
8. *Epimys orbus*, Robinson & Kloss, Ann. & Mag. Nat. Hist. (8) xii. p. 288 (1914). Bandon, N.E. Malay Peninsula.

9. *Epimys fraternus*, Robinson & Kloss, Journ. Straits Branch. Roy. Asiat. Soc. No. 73, p. 273 (1916).
Korinchi, West Sumatra.

In dealing with Oriental rats it has been the fashion to regard the degree of spininess as a constant specific character, almost of subgeneric value, though as Thomas has pointed out this is of no differential value in South American rodents. To a certain extent this also appears to be true of the series listed above, which are essentially mountain rats: *R. lepturus* and *R. brahma* are very woolly rats without a trace of spines. *R. orbus* on the other hand is a very spiny rat. In all however the woolly underfur is well developed. *R. fraternus* is spiny at low elevations but appears to become progressively more woolly as the altitude of its habitat increases.

Possibly additional wool has been developed at the expense of spines in those localities where in addition to the fall in temperature there is a very great increase in humidity, though it is fair to admit that the spiniest local rat, *R. inas* (Bonh.) is exclusively an inhabitant of high levels where the precipitation is presumably high.

RATTUS BARTELSI (Jent.).

Mus bartelsi, Jentink, Notes Leyden Museum XXXIII, p. 69 (1910) (Pangerango. W. Java, 6,000').

Of this species also I collected a very large series from what is practically the type locality. It is an inhabitant of intermediate zones, being rare above 7,000' or below 4,500'.

Jentink's description of this form is quite recognizable except that he states that the ear is short, whereas it is decidedly long for the size of the animal.

Fur of one element only fairly long and extremely dense and soft dark grey at the base tipped with buffy or hazel in some cases almost black on the median line, general effect very variable from almost liver brown to cinnamomeous. Underparts which are sharply defined from the upper surface equally variable from almost white to dark silvery grey. Head more greyish brown, sides of the neck and shoulders buffy ochraceous.

Feet and hands yellowish white without dark metapodials. Ears long, very finely haired. Tail extremely finely ringed, bicolor, the distal third yellowish white above and below.

Skull:—With no specially distinctive features; nasals decidedly spatulate, palatal foramina shorter and broader than in *lepturus*: mesopterygoid space narrow. Bullae small, slightly flattened and very narrow; ridges in old specimens fairly pronounced. Teeth very small. Anterorbital plate sloping strongly forwards.

Specimens examined:—Sixty-five, of all ages.

Measurements:—For detailed measurements see pp. 98, 99.

Remarks:—I am unable for the present to refer this rat to any group. In some respects it resembles *R. inas* except for its entire absence of spines.

MEASUREMENTS OF **Rats from Western Java** in *mm.*

Rattus lepturus (Jent.)	Sex.	Body. Head and Body	Tail.	Hind foot.	Ear.	Skull. Greatest length.	Condylo-basilar length.	Dia-stema	Zygo-matic breadth.	Length of na-sals	Upper molars.	Condition of teeth.	F.M.S No	Remarks
Kandang Badak, Gedeh, W. Java, 7,900′	♂	145	211	30·5	26	37·9	31·9	9·0	17·2	13·0	7·0	Sl. worn	88/16	Adult.
,, ,,	♀	143	218	31	25	..	..	9·3	17·9	14·5	7·0	,,	76/16	..
,, ,,	♂	..	..	..	..	37·7	33·0	10·1	17·3	14·0	7·0	Ml. ,,	74/16	..
,, ,,	♂	143	215	31	25·5	38·8	33·2	9·9	17·7	14·2	7·1	,,	91/16	.. aged.
,, ,,	♂	150	227	31	25	37·8	32·7	10·0	16·9	13·3	7·1	,, ,,	75/16	..
,, ,,	♂	138	210	28	24	35·1	30·2	9·1	16·7	12·2	6·9	Un ,,	77/16	..
,, ,,	♂	154	207+	31	25	37·8	32·0	9·6	17·8	13·5	7·0	,,	79/16	..
,, ,,	♀	155	228	31	26	37·6	32·0	9·3	17·2	13·7	7·0	Ml. ,,	72/16	..
,, ,,	♀	154	217	28	24	38·0	31·8	9·1	16·8	13·9	7·1	,,	96/16	..
,, ,,	♂	150	215	31	26	39·6	33·6	9·7	17·7	15·0	7·3	,,	97/16	..
,, ,,	♂	150	219	31	25	..	33·0	10·0	17·9	14·2	7·3	,,	175/16	..
Tjibodas, Gedeh, W Java, 4,500′	♀	142	223	31	24	36·3	31·0	9·3	16·8	13·9	7·0	V sl. ,,	173/16	,,
,, ,,	♀	137	206	32	24	35·7	30·2	9·0	17·0	13·0	7·0	Sl. ,,	174/16	,,
,, ,,	♂	150	250	31	25	40·0	33·0	9·9	17·6	14·2	7·2	Ml. ,,	217/16	,,
,, ,,	♂	139	223	31	26	38·6	32·8	9·2	17·2	14·0	7·1	,, ,,	273/16	,,
Kandang Badak, 7,900′	♀	135	205	31·5	25	34·9	29·8	8·4	16·0	12·8	7·1	Un ,,	42/16	Sub-Adult.
,, ,,	♀	139	218	29	26	38·2	32·8	9·7	17·3	13·8	6·9	Ml. ,,	244/16	Adult.
Tjibodas, 5,000′	♂	148	235	31	26	38·9	32·1	10·0	17·2	14·2	7·2	,,	44/16	,,
Kandang Badak, 7,900′	♂	144	237	30	25	39·1	32·5	9·8	17·3	13·9	7·0	,,	45/16	..
,, ,,	♂	155	226	32	25·5	40·2	33·7	10·3	17·9	15·0	7·1	,,	46/16	..
,, ,,	♀	142	216	31	26	36·9	31·0	9·1	17·0	12·8	7·1	Sl. ,,	47/16	Sub-Adult.
,, ,,	♀	134	213	31	25	36·0	30·8	9·5	16·8	13·0	7·1	,, ,,	48/16	Adult.
,, ,,	♂	131	207	29·5	25·5	36·3	30·5	9·2	16·2	13·5	7·0	V sl. ,,	52/16	Sub-Adult.
,, ,,	♀	146	225	30·5	26	37·2	32·1	9·7	17·0	13·8	7·0	,,	53/16	Adult.
,, ,,	♀	129	208	29	25	35·8	30·2	9·3	16·1	12·9	6·9	,, ,,	54/16	..
,, ,,	♀	147	213	30·5	25	38·0	32·2	10·1	16·7	13·1	7·0	,,	55/16	..
,, ,,	♀	130	220	31	25·5	36·2	31·0	9·4	16·8	12·9	7·0	Sl. ,,	58/16	..
,, ,,	♀	133	211	31·5	25	36·0	30·2	9·2	16·4	12·8	6·9	Ml ,,	59/16	..
,, ,,	♂	156	214	30	25	38·1	32·3	9·4	16·8	14·0	7·1	,,	60/16	..

MEASUREMENTS OF **Rats from Western Java** in *mm.—Continued.*

Rattus lepturus (Jent.)	Sex.	Body.				Skull.								F.M.S. No.	Remarks
		Head and Body.	Tail.	Hind-foot.	Ear.	Greatest length.	Condylo-basilar length	Dia-stema	Zygo-matic breadth	Length of nasals.	Upper molars.	Condition of teeth.			
Tjibodas, Gedeh, W. Java	♀	128	197	30	25	36·3	30·2	9·1	16·8	13·0	7·0	Sl.	worn	61/16	Adult.
,, ..	♀	130	221	30	24·5	36·2	30·9	9·1	16·8	13·1	7·0	Ml.	,,	62/16	,,
.. ..	♂	144	229	31	24	36·3	31·8	9·3	16·5	12·6	7·1	Ml.	,,	63/16	..
.. ..	♂	148	216	32	25	37·1	31·0	9·1	17·0	13·0	7·1	Un	,,	64/16	..
.. ..	♀	146	223	31	25	37·0	31·3	9·2	16·9	12·9	7·1	Sl.	,,	65/16	..
.. ..	♀	138	210	31	26	36·2	30·3	9·0	16·8	12·9	7·1	Sl.	,,	66/16	..
.. ..	♂	150	231	32	24·5	39·1	33·7	9·3	17·2	14·0	7·2		,,	67/16	..
Kandang Badak, Gedeh, W. Java, 7,900′	♂	136	210	30	25	34·8	30·2	8·9	17·1	12·8	7·1	Sl.	,,	81/16	..
.. ..	♂	148	216	29	25	38·8	31·9	9·2	17·8	14·1	7·1		,,	89/16	..
.. ..	♂	144	209	30	25	37·2	31·4	9·6	17·5	13·1	7·2	Ml.	,,	85/16	..
.. ..	♂	141	208	30·5	25·5	36·3	30·9	8·9	16·9	12·5	6·9	Un	,,	90/16	Sub-Adult.
.. ..	♀	137	198	30	25	36·7	31·2	9·2	16·5	13·1	7·2	V. sl.	,,	86/16	Adult
.. ..	♂	147	220	30·5	25·5	38·0	32·0	9·2	17·0	13·9	7·2	Ml.	,,	84/16	,,
.. ..	♂	154	218	31	25	38·2	32·1	9·3	17·0	13·5	7·0	Ml.	,,	87/16	.. aged.
Tjibodas, Gedah, W. Java	♂	159	196	32	24	36·3	30·4	9·2	16·9	13·1	7·2	Sl.	,,	191/16	..
.. ..	♂	147	219	31·5	24	37·3	31·7	9·8	17·6	13·3	7·0	Sl.	,,	193/16	..
.. ..	♀	129	218	29	24	37·1	30·4	9·2	16·6	12·9	7·1	Sl.	,,	194/16	..
.. ..	♂	150	244	33·5	27	39·8	33·0	10·0	17·4	14·3	7·2	Ml	,,	195/16	.. aged
Kandang Badak, Gedeh, W. Java, 7,900′.	♀	139	217	29	24	37·7	32·0	9·8	17·1	13·6	7·0		,,	199/16	..
.. ..	♂	155	222	30·5	25	39·0	33·0	9·8	17·9	14·0	7·1		,,	200/16	..
.. ..	♂	160	..	30	25	..	..	10·0	17·8	14·0	7·1		,,	202/16	..
.. ..	♂	139	..	31	25	39·0	32·2	9·6	17·3	14·2	7·1	Ml.	,,	203/16	..
.. ..	♂	141	221	31	25·5	38·0	32·9	9·9	16·9	13·6	7·0	Sl.	,,	204/16	..
.. ..	♂	156	225	30	25	38·2	33·0	9·9	17·6	14·0	7·0	Ml.	,,	207/16	..
.. ..	♂	148	215	30	25	38·4	32·2	10·0	17·9	14·2	7·1		,,	209/16	..
.. ..	♂	148	226	31·5	25	38·0	32·8	10·0	17·2	13·2	6·9	Ml	,,	210/16	..
.. ..	♂	145	211	30	24	38·1	32·0	9·9	17·1	14·1	7·0	Sl.	,,	214/16	,,
,, ..	♂	152	232	31	24	37·3	32·6	9·8	17·7	13·9	7·1	Ml	,,	216/16	..

MEASUREMENTS OF **Rats from Western Java** in *mm.—Continued.*

Rattus bartelsi (Jent).	Sex.	Body				Skull.								
		Head and Body.	Tail.	Hind-foot.	Ear.	Greatest length.	Condylo-basilar length.	Dia-stema.	Zygo-matic breadth.	Length of nasals.	Upper molars.	Condition of teeth.	F.M.S. No.	Remarks.
Kandang Badak, Gedeh, W. Java 7900'.	♂	137	157	35	26	35.0	30.0	9.1	15.7	12.8	5.5	Sl worn	68/16	Adult.
.. ..	♀	136	155	33	26	36.0	30.4	9.3	15.9	12.5	5.4	Sl ..	69/16	..
Tjibodas, Gedeh, W. Java 5000'.	♂	149	161	34	26	38.6	32.5	10.4	15.9	14.0	5.7	Ml. ..	70/16	..
.. ..	♀	153	168	33	25.5	37.9	32.6	9.9	16.1	13.8	5.5	..	99/16	..
.. ..	♂	153	162	34	24.5	37.2	31.8	9.9	15.7	13.4	5.4	Ml ..	100/16	..
.. ..	♂	148	153	33.5	24	35.5	30.3	9.2	15.4	13.3	5.3	Ml. ..	104/16	..
.. ..	♂	155	159	33.5	25	38.9	33.0	10.4	16.1	14.0	5.2	..	105/16	..
.. ..	♂	160	179	36	26	38.4	32.2	10.6	16.0	15.2	5.2	..	107/16	..
.. ..	♂	155	165	35	25	37.0	32.2	10.2	..	14.1	5.4	Sl. ..	108/16	..
.. ..	♂	153	163	34	26	36.1	31.0	9.9	15.2	14.1	5.2	Sl. ..	109/16	..
.. ..	♂	154	153	34	24	36.4	31.1	9.9	15.8	14.8	5.6	Sl. ..	110/16	..
.. ..	♀	151	164	33.5	25	37.3	31.7	9.7	16.1	15.1	5.2	Ml. ..	113/16	..
.. ..	♀	137	143	33.5	23	35.4	29.3	9.2	15.3	13.2	5.3	Sl ..	115/16	..
.. ..	♂	144	150	33	26	35.7	30.0	9.3	16.0	13.3	5.3	Sl. ..	116/16	..
.. ..	♀	145	150	33	25	36.9	31.4	9.6	16.5	14.0	5.2	Ml ..	117/16	..
.. ..	♀	141	162	34	25	36.3	30.8	9.5	16.0	13.9	5.4	Sl. ..	118/16	..
.. ..	♀	137	153	33	26	36.1	30.8	9.9	16.0	13.8	5.3	Ml. ..	119/16	..
.. ..	♀	147	148	33	25	35.0	29.4	9.2	15.3	13.1	5.0	Ml. ..	120/16	..
.. ..	♀	124	144	33	24	35.0	29.0	9.0	14.9app.	13.1	5.1	V. sl ..	121/16	Ml. adult
.. ..	♂	156	169	33	26	38.1	32.2	10.0	16.2	15.2	5.4	Sl. ..	123/16	Adult
.. ..	♂	147	157	33.5	25	36.0	30.6	9.8	16.0	15.0	5.3	Sl. ..	124/16	..
.. ..	♀	141	157	33	25.5	37.1	31.1	9.8	15.9	14.8	5.6	Ml. ..	125/16	..
.. ..	♂	149	164	33.5	25	37.0	31.1	10.0	16.2	14.0	5.6	Ml. ..	126/16	..
.. ..	♀	134	151	33	26	35.4	29.8	9.4	15.5app.	14.7	5.4	V. sl. ..	128/16	Ml. adult.

MEASUREMENTS OF **Rats from Western Java** in *mm.—Continued.*

Rattus bartelsi.	Sex.	Body. Head and Body.	Tail.	Hind-foot.	Ear.	Skull. Greatest length.	Condylo-basilar length	Dia stema	Zygo-matic breadth	Length of nasals	Upper molars	Condition of teeth	F.M.S. No.	Remarks.
Tjibodas, W. Java, 5000′	♂	145	171	34	25	37·0	31·6	10·0	16·0	14·0	5·4	worn	120/16	Adult
.. ..	♀	164	156	33	24	39·1	30·0	9·8	15·8	14·1	5·4	Sl. ..	139/16	..
.. ..	♀	150	156	34	25	39·9	32·4	10·1	16·1	14·8	5·2	Sl. ..	179/16	..
.. ..	♀	150	161	34	26	37·8	31·3	9·9	16·3	14·5	5·3	Ml. ..	185/16	..
.. ..	♀	151	149	34	23	37·4	31·5	10·0	16·4	14·3	5·2	.. ..	171/16	..
.. ..	♀	151	151	33·2	25	37·9	31·7	10·0	16·1	14·1	5·1	Ml. ..	184/16	..
.. ..	♂	143	140	35	25	36·8	31·8	9·9	16·0	13·9	5·3	Sl. ..	183/16	..
.. ..	♂	153	157	33	24	36·1	31·0	9·8	16·0	14·1	5·2	Ml. ..	181/16	..
.. ..	♂	135	107	35	26	37·9	32·1	10·1	16·3	14·0	5·4	Ml. ..	167/16	..
.. ..	♂	139	164	34·5	24·5	36·2	30·1	9·9	16·1	14·0	5·5	Sl. ..	180/16	..
.. ..	♂	153	154	34	24	36·8	31·0	10·1	15·9	14·0	5·2	Sl. ..	220/16	..
.. ..	♀	156	167	33·5	25	38·0	32·3	10·1	16·0	13·8	5·2	Ml. ..	222/16	..
.. ..	♂	156	163	33·5	26	36·9	31·8	10·0	15·7	14·7	5·4	Sl. ..	236/16	..
.. ..	♀	148	157	34·5	25	..	32·0	10·0	16·7	14·0	5·1	.. ..	235/16	..
.. ..	♂	159	164	34	25	38·0	31·7	10·1	15·8	13·9	5·4	Ml. ..	240/16	..
.. ..	♂	145	160	34	25	31·0	32·8	10·4	16·1	15·0	5·5	Ml. ..	243/16	..
.. ..	♀	147	167	34	24·5	38·0	32·8	10·5	16·4	15·2	5·3	.. ..	230/16	..
.. ..	♂	147	171	30	27	37·8	32·0	10·2	16·0	14·0	5·3	.. ..	241/16	..
.. ..	♂	156	169	35	27·5	38·0	32·1	10·1	16·0	14·0	5·6	Ml. ..	242/16	..
.. ..	♀	149	158	33·5	26	37·2	31·8	10·2	16·1	14·3	5·3	.. ..	243/16	..
.. ..	♀	147	148	34	26	36·9	31·2	10·0	16·0	13·8	5·5	.. ..	245/16	..
.. ..	♀	147	155	34	23	36·2	31·1	9·6	16·0	13·9	5·3	Ml. ..	282/16	Adult. N.C.M.*
.. ..	♀	149	149	31	25	35·3	30·0	9·3	15·1	13·2	5·3	Sl. ..	279/16	Adult. N.C.M.
.. ..	♂	154	167	33	25	37·3	31·4	9·9	15·8	14·1	5·2	Ml. ..	286/16	Adult. N.C.M

* N.C.M. signifies Body measurements by Native Collector

XIII. ON THREE NEW RACES OF MALAYAN MAMMALS.

By H. C. Robinson, *C.M.Z.S.*

Nycticebus coucang insularis, *subsp. nov.*

Type:—Old male (skin and skull) No. 963/15, Federated Malay States Museums, collected at Sungei Nipa, south end of Pulau Tioman, Pahang, on July 19th, 1915, by H. C. Robinson.

Characters:—Allied to the mainland form, *N. c. buku* (Martin), but separated from that by the indistinctness of the facial markings, the absence of any vertebral streak and the general rufous colouring. Skull with the temporal ridges not meeting; two pairs of upper incisors.

Colour:—Above ochraceous tawny, considerably paler beneath; head and face silvery, the eyes surrounded by a broad ring of sienna brown, extended as a stripe from each eye meeting on the temple; hands and feet paler and more silvery. Bases of the fur above and below pale grey.

Skull:—Bullae and basal region of skull rather more flattened than in *N. c. buku*; temporal ridges separated by about 8 mm. Incisors two pairs in the upper jaw.

Measurements:—Head and body (measured in the flesh) 265; hindfoot 53; ear 14 mm.

Cranial measurements: total length, 60.0; basal length, 49.9; orbital breadth, 37.3; greatest width of skull, 40.1; cranial breadth, 29.2; mastoid breadth 37.1; front of canine to back of last upper molar, 21.5 mm.

Remarks:—The colour of this race sufficiently separates it from *N. c. buku* while the absence of the vertebral stripe differentiates it from *N. c. natunae*, which, however, is somewhat imperfectly known.

It appears doubtful if the characters of the temporal ridges relied on by Lyon to separate the various races of the Slow Lemur can really be trusted to do so. In the present specimen however it seems certain that they would never meet, which would ally the Tioman race to those from Borneo and Banka which have only a single pair of incisors in the upper jaw whereas this one has two pairs.

The Slow Lemur is apparently rare in Tioman and is unknown to the majority of the inhabitants. Our specimen was obtained in felling a patch of heavy jungle at the south end of the island.

Incidently it may be noted that the proper name for the Malayan Slow Lemur now generally known as *N. c. malaianus*, (Anderson), is *Nycticebus c. buku* (Martin) founded

on *Semnopithecus buku*, Martin, Ann. and Mag. Nat. Hist. (4), ii p. 435 (1838) itself derived from Raffles' Kra Buku (Trans. Linn. Soc. xiii, p. 247 (1821) which is quite a passable description of the animal.

Lariscus insignis fornicatus, *subsp. nov.*

Type:—Adult female (skin and skull) No. 876/15, Federated Malay States Museums, collected at Juara Bay, East Side of Pulau Tioman, Pahang, on July 1st, 1915, by H. C. Robinson. Original No. 6698.

Characters:—Differing from other forms of *Lariscus insignis* (Cuv.), in its somewhat slighter skull, the nasals broadening less anteriorly and by having the rostrum decidedly more arched laterally, i.e. the nasals meet at an angle instead of lying practically in the same plane.

Colour:—As in the more southern specimens of *Lariscus insignis jalorensis*, being exactly matched by individuals from the Triang District, Western Pahang and having the thighs richly washed with rufous buff more so than in northern specimens, but not approaching in richness of tint above, the Singapore and Johore form, *L. i. meridionalis*, Robinson & Kloss. Area between the black back stripes, somewhat colder in tint than the rest of the upper surface.

Skull:—That of a typical *Lariscus*, though with the regularly curved outline somewhat flattened in the region of the frontals. Nasals less splayed anteriorly and decidedly arched. Rostrum generally more slenderly built. Bullae rather less convergent than in the peninsular form so that the basioccipital is more regularly quadrate in shape. The teeth are rather small but call for no special comment.

Dimensions of the type (measured in the flesh). Head and body, 171 (180[1]); tail, 112 (100); Hindfoot, 44 (43); ear, 18 (16) mm.

Cranial measurements. Total length, 48.8 (48.2); condylobasilar length, 38.0 (36.9); zygomatic breadth 27.1 (26.8); cranial breadth, 20.0 (20.2); greatest length of nasals, 15.6 (15.8); diastema, 12.3 (12.1); upper molar row including pm^3, 8.9 (8.9); least distance from tips of nasals to lachrymal notch, 21.0 (21.0) mm.

Specimens examined:—Four, the type, and an adult and two somewhat immature males all from the typical locality.

Remarks:—Though only slightly differentiated from the mainland race, this form appears sufficiently distinct to merit a name. In colour it is intermediate between *L. i. jalorensis*, from the mainland and *L. i. meridionalis* from Singapore and the southern part of Johore. The characters of the nasals however separate it from both these forms.

(1) Measurements in parentheses are those of an adult male from the same locality F M S No 623/16

Tomeutes tenuis tiomanicus, *subsp. nov.*

Type:—Adult male (skin and skull) No. 728/15, Federated Malay States Museums collected at Juara Bay, East side of Pulau Tioman, Pahang, on June 23rd, 1915, by H. C. Robinson. Original No. 6580.

Characters:—A dull form of *T. tenuis*, more allied to the northern race *T. tenuis surdus* (Miller) than to the brighter typical form from the southern two thirds of the Peninsula and Singapore Id., (*T. tenuis tenuis* (Horsf.)). Differing from *T. tenuis sordidus* (Kloss) from Great Redang Island, in the greater amount of black on the tail and from *T. t. surdus* in the more olivaceous, less ochraceous ground colour of the upper surface and in the reduction of the white tips to the hairs of the tail.

Colour:—Above an uniform grizzle of black and dull olivaceous buff, shoulders, thighs, ears more ochraceous, feet and hinds grizzled blackish and ochreous buff not nearly so bright as in *T. tenuis tenuis* from Singapore. Tail above white, bases of the hairs ochraceous buff, less bright than in the mainland races but much brighter than in the form from Great Redang Id., median area clear black, with a narrow white tip. Pencil almost uniform black. Base of tail beneath and scrotal region buffy. Beneath whitish with a strong cream tint, the bases of the hairs except on the chin, throat and median line broadly grey. Orbital ring, sides of the face and muzzle buffy ochraceous, the two latter more or less grizzled with black. A clear buffy patch at the base of the vibrissae.

Skull and Teeth:—The skull and teeth show practically no differences from the two mainland representatives and are not reduced in size. The bullae are perhaps a little less globose and slightly smaller and the constrictions which are very noticeable in the mainland specimens are much less pronounced. The zygomatic arches are a little heavier.

From the Great Redang, *T. t. sordidus*, the Tioman animal differs in larger size and heavier and deeper rostrum. The regularity of the maxillary nasal suture which is given by Kloss as the only distinguishing cranial feature of his form does not appear to be reliable as it is not constantly present in all the Redang specimens while it occurs in at least 15 per cent. of specimens from other sources.

Measurements:—Collector's external measurements of type: head and body, 125 (136);* tail, 107 (109); hindfoot, 31 (30.5); ear, 13 (13) mm.

Cranial measurements: greatest length, 37.1 (35.2); condylobasilar length, 30.8 (—) interorbital breadth, 12.2 (12.9); palatilar length, 15.9; diastema, 8.2; cranial breadth, 18.1; zygomatic breadth, 22.1 (21.7) maxillary tooth row, 6.9; median length of nasals, 11.1 mm.

* Measurements in parentheses are those of a *T. t. surdus*, F. M. S. Mus. No. 123/13 collected on Kao Nawng, Ban lon, Siamese Malay States on June 14th 1913.

(For detailed measurements see p. 105.

Specimens examined:—Twenty-six, all from the type locality.

KEY TO THE LOCAL MALAYAN RACES OF *Tomeutes tenuis* (HORSF.).

A. Larger forms; total length of skulls never less than 39 mm.

a. Larger, much more greyish beneath, ochraceous yellow patch on outer aspect of thighs, strongly marked ... ... *T. tenuis tahan.*

*a*¹. Smaller, more yellowish buff beneath, ochraceous yellow patch on outer aspect of thighs only slightly marked ... ... *T. tenuis gunong.*

B. Smaller forms; total length of skull never more than 37·5 mm.

b. Richly coloured forms; shoulder and thigh patches, strongly marked; hands and feet bright ochraceous buff ... ... *T. tenuis tenuis.*

*b*¹. Dull coloured forms; shoulders and thigh patches not strongly marked; hands and feet dull olivaceous buff.

c. Black element in pelage of tail much reduced ... ... *T. tenuissordidus.*

*c*¹. Black element in pelage of tail normal.

d. More ochraceous above, terminal whitish tips to tail hairs well marked ... *T. tenuis surdus.*

*d*¹. More olivaceous above, terminal whitish tips of tail hairs reduced ... ... *T. tenuis tiomanicus.*

Measurements of **Tomeutes tenuis tiomanicus** in *mm.*

	Sex.	Body: Head and Body	Tail.	Hind-foot.	Ear.	Skull: Greatest length.	Cond-ylo-basilar length.	Dia-stema	Zygo-matic breadth.	Nasals.	Upper molars.	Condition of teeth.	No.	Remarks
Juara Bay, P. Tioman Pahang.	♀	133	105	29	14	36.9	30.5	8.1	22.3	11.1	7.0	Sl. worn	750/15	Adult.
.. ..	♀	127	99	30	13	37.0	30.1	8.0	22.5	11.2	7.2	.. ..	725/15	Yg. Adult.
.. ..	♀	135	105	29	13	37.4	30.8	8.2	22.3	11.7	7.1	Ml. ..	755/15	Adult.
.. ..	♂	138	94	26	15	36.5	30.2	8.1	21.4	11.7	7.0	..	753/15	.. N.C.M.*
.. ..	♀	138	105	27	15	37.2	30.9	8.2	22.2	11.8	7.0	Sl. ..	752/15	.. ..
.. ..	♀	135	imp.	25	15	36.2	30.0	8.0	22.4	10.9	6.5	..	754/15	.. ..
.. ..	♂	125	107	31	13	37.1	30.8	8.2	22.1	11.1	6.9	.. ..	728/15	.. Type.
.. ..	♂	137	116	32.5	13	37.2	31.0	8.1	22.2	11.3	7.0	Not ..	733/15	Yg. Adult.
.. ..	♀	130	102	30.5	13	35.9	29.2	7.8	22.3	11.0	6.9	.. ..	722/15	..
.. ..	♂	131	104	29	13	36.1	29.3	7.8	22.1	11.7	6.8	..	730/15	Adult.

*N. C. M. signifies Body Measurements by Native Collector.

XIV. REPORT ON A COLLECTION OF REPTILES AND BATRACHIANS FROM JAVA.

By N. Annandale, D.Sc., F.A.S.B., (*Zoological Survey of India*).

Mr. H. C. Robinson has kindly given me the opportunity of examining a collection of reptiles and Batrachia made by him in February, 1916, at Tjibodas, in the mountains of Western Java, at altitudes between 4,700 and 6,500 feet. He has further permitted me to retain in the Indian Museum a first set of all the specimens, including the type of the only new species, a frog of the interesting genus *Nyctixalus*, Boulenger.

There is no recent monograph on the herpetology of Java, but both the reptiles and the Batrachia are well known and Tjibodas has been a favourite collecting station. In his memoir entitled "A Contribution to the Zoögeography of the East Indian Islands" Barbour[1] has discussed the distribution of both groups in reference to the island as a whole, but, as in most eastern countries, there is still much to be done in the study of local faunas.

Mr. Robinson's collection is evidently representative of the local fauna of the district in which it was made. It includes specimens of 13 species of reptiles and of 13 of batrachians, as follows:—

Reptilia.

Lizards—

Gonyocephalus chamaeleontinus (Laur.)	10	specimens.
Calotes tympanistriga (Gray) ...	10	,,
Lygosoma temminckii, D. & B. ...	28	,,
Mabuia multifasciata (Kuhl.) ...	7	,,

Snakes—

Tropidonotus chrysargus, Schleg. ..	2	specimens.
Zamenis korros (Schleg.) ...	1	juv.
Oligodon bitorquatus, Boie .	1	specimen.
Calamaria leucocephala, D. & B.[2] ...	1	,,
Calamaria linnaei, Boie ...	3	specimens.
Psammodynastes pulverulentus, Boie ...	3	,,
Bungarus candidus, Linn. ...	1	specimen.
Doliophis intestinalis (Laur.) ...	1	,,
Ancistrodon rhodostoma (Boie) ...	2	specimens.

(1) *Mem. Mus. Zool. Harvard*, XLIV, No. 1 (1912).

(2) A melanic specimen in which the greater part of the ventral surface as well as the whole of the dorsal and lateral surfaces, is darkened.

Batrachia.

Rana grunniens, Daudin	...	2 specimens.
Rana kuhlii, D. & B.	...	2 ,, (juv.).
Rana limnocharis, Wiegmann	...	7 ,,
Rana javanica, Horst.	...	1 specimen.
Rana chalconota (Schleg.)	..	23 specimens.
Rana jerboa (Günther)		6 ,,
Ixalus aurifasciatus (Schleg.)	...	21 ,,
Nyctixalus robinsoni, sp. nov.	...	3 ,,
Microhyla annectens, Boulenger	...	17 ,,
Bufo asper, Gravenh.	...	1 specimen.
Bufo cruentatus, Tschudi	...	20 specimens.
Megalophrys hasseltii (Tschudi)		3 ,,
Megalophrys montana, Kuhl	...	14 ,,

I have nothing further to say about the reptiles, all of which are well-known species. Descriptions of the lizards will be found in de Rooij's volume[1] on the Indo-Australian lizards and Chelonia, and of the snakes in the British Museum Catalogue.

The frogs and toads call for comment or description in several instances, the excellent state of preservation of most of Mr. Robinson's specimens permitting points hitherto obscure to be elucidated.

FAMILY RANIDAE.

Genus Rana, Linné.

Rana javanica, Horst.

1883. *Rana macularia*, var. *javanica*, Horst, *Notes Leyden Mus.* V. p. 243.

1891. *Rana nicobariensis*, Boulenger, *Ann. Mag. Nat. Hist.* (6) VIII, p. 291.

1906. *Rana javanica*, van Kampen, Weber's *Zool. Ergebn. Ned. Ost.-Ind.* IV, p. 392.

1912. *Rana nicobariensis*, Boulenger (in part), *Faun. Malay Pen., Rept.*, p. 240.

1912. *Rana javanica*, Barbour, *Mem. Mus. Zool. Harvard* XLIV, p. 169.

There is a single specimen in the collection; it is 32 mm. long from the tip of the snout to the vent. I have compared it with the types of Stoliczka's *R. nicobariensis*, which are faded but otherwise in good condition. It differs from them in most of the points noted by van Kampen as specific, notably

(1) *The Reptiles of the Indo-Australian Archipelago I.* (Leiden: 1915).

in the broader interorbital space and narrower web to the toes. The colouration is also strikingly different. The back is pinkish buff with sparsely scattered small round black spots and with a faint pale middorsal line extending forwards from the vent about half way to the shoulders. The sides of the head and the anterior half of the body are black, but both lips are white, the white area on the upper lip extends backwards as a broad line as far as the axilla and there is a narrow white line running forwards from the upper eyelid to the tip of the snout. The sides of the posterior half of the body are a little darker than the back and bear numerous black spots; the area thus coloured is separated from the dorsal surface by a thin black line. The fore limbs are pale with indistinct dark spots of small size, but the hind limbs are darker than the back and are marked with incomplete dark cross-bars. A thin black line extends along the middle of the upper surface of the thigh and behind it the skin is spotted. The whole of the ventral surface is unpigmented.

A specimen of *R. nicobariensis* from the Jalor Caves, near Biserat in Peninsular Siam on the other hand, agrees fairly well with the types of the species.

Genus Ixalus, D. & B.

Stejneger* has shown that in the strict letter of the law the name of this genus should be *Philautus*, Gistel. Four species have been recorded from Java, namely *flavosignatus* (Boettger), *aurifasciatus* (Schlegel), *vittigera* (Boulenger) and *pallidipes* (Barbour). After some doubt I have decided that the large series of specimens in Mr. Robinson's collection all represent the second of these.

Ixalus aurifasciatus (Schlegel).

1844. *Hyla aurifasciata*, Schlegel, *Abbild.*, p. 27, pl. ix., fig. 4.

1882. *Ixalus aurifasciatus*, Boulenger, *Cat. Batr. Sal. B. M.*, p. 100.

Schlegel's figure gives a very good idea of the facies and proportions, but it is evident from the specimens before me that the colouration is almost as variable as in *I. variabilis* from Ceylon and South India. None of these specimens happen to bear the golden band across the forehead from which the specific name is derived. There are two large specimens (snout to vent 27 mm.) of very remarkable colouration. In one the whole of the dorsal surface is black, with irregular yellow streaks which converge inwards from the sides. In the other the colours are the same but the yellow predominates over the black. There seems to be no vocal sac in the adult male.

* *Proc U. S. Nat. Mus.* XXVIII, p. 346 (1905).

Genus Nyctixalus, Boulenger.

1882. *Nyctixalus*, Boulenger, *Ann. Mag. Nat. Hist.* (5) X, p. 35.

1912. *Nyctixalus*, Barbour, *Mem. Mus. Zool. Harvard* XLIV (1), p. 70.

The only form hitherto assigned to the genus is the type-species *N. margaritifer*, Boulenger. It is recorded as being from "the East Indies." Barbour examined a specimen from Tjibodas and published a figure, which is certainly incorrect. (*op. cit.*, pl. viii, fig. 32). He noted certain peculiarities, however, that also occur in Mr. Robinson's specimens. The differences must, therefore, be specific and I describe the Javanese form as a new species, under the name

Nyctixalus robinsoni, *sp. nov.*

Head large, triangular; snout pointed, a little longer than the orbit; nostril about half way between the eye and the tip of the snout, rather prominent. Tongue deeply notched, without free papilla. No vocal sacs. Interorbital space flat, broader than upper eyelid. Tympanum hidden, very small. A strong fold from the upper eyelid to the shoulder. Dorsal surface of head and body with scattered rounded tubercles; eyelid tubercular; ventral surface of head and body coarsely tubercular. Hind limbs long; tibiotarsal articulation reaching the anterior margin of the eye or the tip of the snout. Subarticular tubercles poorly developed; an obscure inner metatarsal tubercle. Discs on fingers and toes at least as large as the tympanum. Digits short; first finger not extending as far as second; toes about 1/3 webbed; no web on the fore feet.

Length of head and body in type-specimen 20 mm.

Dorsal surface dark grey or brown, obscurely mottled; a silvery cross-bar sometimes present between the eyes. Flanks mottled with black and white. Hind limbs with irregular brown cross-bars. Ventral surface speckled with grey or entirely infuscated.

The species differs from *N. margaritifer* in its small hidden tympanum, in the position of the nostril and probably in other points. The iris can apparently be closed completely over the pupil, but Barbour's figure represents the opening as very large and transversely oval, thus completely ignoring the essential generic character, which is the vertical form of the slit. Apart from this character and from its darker colouration the species closely resembles *Ixalus aurifasciatus*.

Locality. Tjibodas, Java: alt. 4,700-6,500 feet (*February, 1916*).

Type-specimen. No. 18,337 Rept., Zool. Survey India. Cotypes in the Selangor Museum.

FAMILY PELOBATIDAE.

Genus Megalophrys, Kuhl.

Megalophrys montana, Kuhl.

1912. *Megalophrys montana*, Boulenger, *Faun Malay Pen., Rept.*, p. 277.

1912. *Megalophrys montana*, Barbour, *Mem. Mus. Zool, Harvard* XLIV (1) p. 77, pl. vii, fig. 30 (coloured figure).

In Mr. Robinson's series there are several specimens with minute appendages on the eyelids and snout and two young individuals with these appendages so well-developed that they appear to represent a form intermediate between *M. montana* and *M. nasuta*. I doubt, therefore, whether *M. nasuta* (Schleg.) is more than a variety of *M. montana*. Kuhl.

XV. FURTHER NOTES ON AN ABORIGINAL TRIBE OF PAHANG.

By Ivor H. N. Evans, B.A.

The following notes on customs, religious beliefs, etc. were omitted from a former paper of mine in this Journal,* which dealt with several of the aboriginal tribes of Pahang. They refer to a tribe, or section of a tribe, of Jakun whose place of origin is said to be Salang on the Tekam River, Pulau Tawar, but who, when I met them, were settled on the Tekai River.

Beliefs with Regard to Natural Phenomena.

(1.) According to the Jakun the sun is held by an anteater. When he rolls his body round it the light is no longer seen and it is night; but, when he unrolls himself, the sun shines clearly and it is day.

(2.) The rainbow is a dragon in the sky.

(3.) An eclipse of the moon portends sickness.

(4.) Thunder is made by a spirit called *Ninek*,† who makes a noise in his armpits by banging his arms against his body.

(5.) *Ninek* makes the lightning by flashing a thin board about which is attached to a string (i.e. a bull-roarer).

The Under-World.

The Jakun gave me some details with regard to their belief in an under-world. I recount them below, just as they were told to me.—

There are dragons in the under-world and a single old woman. She makes her house and her belongings from the bones of people who have died upon the earth. Their ribs become the floor of her house, their leg-bones the posts, and their skulls water-vessels. This woman, when she has reached the limits of old age, becomes young again. Her name is Arud. The dragons, who have horns, are her playthings. One of them is her special pet and sits close to her.

Customs and Beliefs Connected with Death and Burial.

The following details with regard to customs and beliefs connected with death and burial were given me by one of the men of the settlement.

* Vol. V, pp. 209-211 (1915)

† *Nyaut* as an equivalent for the Malay *hantu* is a common word in many Sakai dialects. *Ed.*

On a death occurring, the village is deserted. A corpse is not buried, but is left in the house where death took place; food, tobacco and personal belongings being placed near to it. The hut in which a body is left is often fenced round. Corpses are not buried because it is thought that the spirits of the dead would find difficulty in making their way upwards if this were done.

A Custom with Regard to Personal Names.

I was informed that names given in childhood are often changed at about the age of puberty. For instance, the Jakun told me that one man named Itam had formerly been called Ketiel.

XVI. MALAY BACK-SLANG.

By Ivor H. N. Evans, B.A.

The following are some examples of one kind of Malay back-slang *chakap balik* (obtained from a Linggi, Negri Sembilan, Malay), which is used by bad mannered Malay children when they wish to talk secrets before their elders and betters or before uninitiated companions. The first stanza is a *pantun* in ordinary Malay, the second the same converted into back-slang. A beginner is supposed to learn both of these by heart in order to acquire a facility in this secret means of communication. There do not seem to be any very well defined rules for converting ordinary words into back-slang by this method, except that in those of two syllables, the syllables are generally transposed. In three-syllable words, letters or syllables may be inserted and the original letters or syllables transposed, but the last syllable in many cases remains unchanged.

Rioh rendah bunyi-nya burong.
Burong terbang deri sa'brang.
Hinggap sa'ekor atas bumbongan (tulang bumbong).
Menegoh bumbongan hanyut deri ulu.
Perisek pekasam udang.
Anak rimau jantan mati jerongkong.

Yori yarah nubi nerubong.
Nerubong terbarung rida serabung.
Ngahip jikou latung u-ung.
Megonoh latung u-ung nyor-at rida luhu.
Pesingik pesangam dahung.
Nahak mori tajan tima jikorong.

Further examples of ordinary Malay with back-slang equivalents.

(1) Angkou hendak ka'mana?
(1*a*) Angkangou nahak kenema?

(2) Aku hendak pergi Taiping.
(2*a*) Kua nahak giper Payteng.

The next example was given to me by a Province Wellesley man. In it the insertion or addition of the letter s either with, or without, a vowel before or following it seems to be the chief feature. There appear to be many different methods of talking back-slang.

(1) Hang nak pergi kemana?
(1*a*) Has nasak perasgisi kas-mas-nasa?

The following are instances from Kuala Langat (fide Raya Mutlak).

(1) Mari kita makan nasik;
(1*a*) "Rima taki kaman senak."

(2) Terima kaseh; Sahaya baru sudah.
(2*a*) "Matri sekah; yahsa ruba dasu."

(3) Orang itu banyak tinggi.
(3*a*) "Raong too-i nyabak giting."

(4) Lebeh daripada anam kaki.
(4*a*) "Beleh daparida mama kika."

(5) Besok kita pergi ka-singapura.
(5*a*) "Sebok taki giper ka-Ngasingrupa."

(6) Berapa hari baru kita balek?
(6*a*) Pabera hira ruba taki lebak?

(7) Barang satu minggu!
(7*a*) "Rabang tusa guming."

XVII. MALAY NOTES.

By Ivor H. N. Evans, B.A.

The following disconnected notes on some Malay beliefs and customs, collected in the Malay Peninsula at various times during the last four years, may possibly be of interest, since I do not remember having seen many of them recorded before. In each case I append the name of the district from which my informant came.

(i) Houses should not be built on promontories, either those which jut out into the rivers or into padi fields, as such places are frequented by spirits. (From a man of Kampong Linggi, Negri Sembilan).

(ii) If you hear a noise at night in the jungle, it is forbidden to call out and ask your companions what is making it. (From a man of Kampong Linggi, Negri Sembilan).

(iii) A small species of house-cricket, which is known to the Malays as *Semangat rumah*, is said to indicate the good or evil fortune of the owner of a house. If the cricket is first heard low down in the wall but gradually makes its way up higher, it is considered to imply that the house-holder will become rich. If, however, the sound of the cricket is first heard high up, and then lower down, monetary losses will be incurred. (From a man of Kampong Linggi, Negri Sembilan).

(iv) Nests, either of the black ant or of the termite, are sometimes thought to be the dwelling places of spirits. (Awang, a Malay smith of Lenggong in Upper Perak asked me one day to desist from poking an ant-hill, which stood close to his forge, with my walking stick. On my asking the reason he replied that there was a spirit in it. Questioned as to his grounds for thinking so, he said that, if there were not, he did not see how such a tall mound could have arisen).

(v) It is unlucky to step over a fishing-rod which has been left lying on the bank of a river with the line in the water. Mothers scold their children if they do this when a family party is out fishing, as they think that no fish will be caught. (From a native of Ijok, Selama District of Perak).

(vi) Women, while making the yeast *(ragi)* for *tapai* cakes, must not see a corpse, or, when they are made, fermentation of the flour will not ensue. (From a Malay of Kampong Linggi, Negri Sembilan).

(vii) According to Province Wellesley Malays fire-flies are the clippings from peoples' finger nails.

(viii) If you think that you have seen a ghost, you must spit three times, in order that no evil results may follow. (From a Province Wellesley Malay).

(ix) A couple of nights after the death of the late Sultan Ahmad of Pahang (May, 1914) there was a bad storm of wind in Taiping. This was considered by all the Malays living in the town as a sign of the Sultan's passing.

(x) If a cock and a hen copulate on the roof of a Malay house, they are caught and killed. Both are then skinned and the skins placed on slender poles planted in the ground, one on each side of a path. A cross piece is often tied to the upright, a little way from the top, in order that the skin of the body may be spread over it, while the head and neck of each bird rest on the end of the upright. The flesh of the birds is eaten by the people of the house. The action is said to be *chelaka*, i.e. unchancy. (I saw two or three instances of crucifixion of this kind when in Upper Perak in 1913.

(xi) If a man washes his hands and in shaking the drops from them (to dry them) splashes a companion, the latter says, "*Lepas kah?*" (i.e. "Do you release me?"). To this the man who has been washing must reply "*Lepas*" (i.e. I release you). If this were not done the sins (*dosa*) of the man who washed his hands would cling to the man who was splashed. (I saw a man so splashed, and heard the above question and answer in 1916. The explanation was given to me by a Province Wellesley Malay, one of the men concerned).

(xii) After the *boria* performances (connected originally with the deaths of Hasan and Husain, but now more or less comic entertainments given by bands of Penang or Province Wellesley Malay youths, who visit the houses of the wealthy in the month Muharram) all those who have taken part in a *boria* go after the last performance to bathe ceremonially in order to rid themselves of the bad luck *(buang-kan sial.)* which attaches to them as having part in a dramatic performance. At Taiping in Perak the *boria* performers bathe at the

Waterfall, and, after this, partake of a curry feast. The washing of the body should be done with seven dippers of water in which limes and soap-root* (*sintok limau*) have been mixed till the water is full of suds. When the bathing is over the remains of the *sintok* and the limes are thrown away, each thrower saying, "*Satu, dua, tiga buang!*" (i.e. "one, two, three, throw them away!"). The "soap" is, of course, washed off afterwards in the ordinary way. Before the feast commences a handful of food-all the kinds to be eaten being included-is taken and placed below a tree in the jungle. The *boria* is performed only by Penang and Province Wellesley Malays, and is said to have originally been adopted from Indian Troops stationed in Penang. (Information obtained from Awang, a Province Wellesley Malay).

* The root of [illegible]

XVIII. THE NATURAL HISTORY OF KEDAH PEAK.

VI. Botany.

By H. N. Ridley, M.A., C.M.G., F.R.S., F.L.S.

Late Director of Gardens, Straits Settlements.

[*The following order belonging to the Monocotyledons was omitted in Mr. Ridley's account of the Botany of Kedah Peak.* Antea pp. 37—88.]

XYRIDEÆ.

Xyris Ridleyi Rendle.

Mixed with the next species. This was the original locality of this plant.

Xyris oreophila, *sp. nov.*

A tufted plant about 12–18 in. tall. Stems swollen at base. Leaves linear flaccid acuminate 8 in. long .1 in. wide, (No. 6138) or rigid and narrower (5962). Culms slender, terete 8 to 18 in. long. Capitulum obovoid .2 in. long. Glumes brown, oblong, the lower ones truncate, emarginate, uppermost blunt, entire, a paler thickened ridge in the centre, the margin thinner but not scarious. Flowers bright yellow .3 in. long, the tube slender, exsert. Petals broadly oblong, obovate, minutely toothed at the rounded top, .15 in. wide. Stamens about half as long, staminodes short, plumed, style and stigmas shorter than anthers. Fruit fusiform, dehiscing down one side, seeds numerous, linear cylindric, narrowed at both ends 1 mm. long.

Kedah Peak 3000 feet alt. Nos. 5962, 6138, 6139. The specimens of the latter number are evidently from a wetter spot and are shorter and more flaccid. It is a much bigger plant than *X. Ridleyi*. The petals are described as butter cup yellow.

XIX. ON THE MONGOOSES OF THE MALAY PENINSULA.

By C. Boden Kloss, *F.Z.S.*

Six species of mongooses are now known to occur in the Malay Peninsula, two of which are described below. One of the six is apparently not indigenous: it is:—

Mungos mungos (Gmel.).

Mangusta malaccensis, F. Cuv., Mamm. pl. 189 (1819).

Herpestes griseus, Cantor, Journ. Asiat. Soc. Bengal, XV, p. 242 (1846).

Herpestes pallidus, Anderson, Zool. Researches, p. 181 (1878).

Herpestes mungo, Flower, P.Z.S., 1900, p. 331; Kloss, Journ. F.M.S. Mus., II, p. 148 (1908); id. Journ. Straits Branch Roy. Asiat. Soc., No. 53, p. 27 (1909).

This animal is supposed to have been introduced from India into Province Wellesley by European planters: it is apparently the typical form from Bengal with slightly ferruginous face and feet and buff under-fur [*vide* Wroughton, Journ. Nat. Hist. Soc. Bombay, XXIV, p. 51 (1915)] but should it prove different Cuvier's name will apply.

The F.M.S. Museums have examples from the district of Larut, Perak, which is adjacent to Province Wellesley, and also a specimen from Kuala Lumpur, Selangor.

Measurements of a female from Taiping, Perak (No. 954/11):—Head and body, 373; tail, 282; hind-foot, 71; ear, 29 mm.

Mungos urva (Hodgs.).

This species has not hitherto been recorded from the Peninsula. It is represented by two examples—an immature female (permanent canines just appearing) and a juvenile male from Trang, Siamese Malaya, obtained in January 1910: they are indistinguishable, on descriptions, from Himalayan and Indo-Chinese animals.

Measurements of the female (No. 1218/10):—Head and body, 451; tail, 260; hind-foot, 96; ear 32.5. Skull: greatest length, 91; greatest breadth, 48 mm.

Mungos brachyurus (Gray).

Herpestes brachyurus, Gray, Mag. Nat. Hist. (N.S.), I, p. 578 (1837); Cantor, Journ. Asiat. Soc. Bengal, XV, p. 143 (1846); Anderson, Zool. Researches, p. 187 (1878); Flower, P.Z.S.

1900, p. 332; Kloss, Journ. F.M.S. Mus. II, p. 148 (1908); id. Journ. Straits Branch Roy. Asiat. Soc. No 53, p. 28 (1909).

Described originally as coming from "Indian Islands," Borneo, may be accepted as the typical locality; the species occurs also in Sumatra. We have no topotypes with which to compare the Malayan animal but it does not seem to differ.

Specimens are in the F.M.S. Museums from Taiping, Perak, and Kuala Lumpur, Selangor.

Measurements of an adult female from the former place (No. 124/14). Head and body, 412; tail, 239; hind-foot, 86; ear 29.5 mm. Skull, greatest length, 99; greatest breadth, 50 mm.

Mungos javanicus peninsulae, Schwarz.

Herpestes javanicus, Cantor, Journ. Asiat. Soc. Bengal, XV, p. 241 (1846); Anderson, Zool. Researches, p. 185 (1878); Flower, P.Z.S. 1900, p. 332; Bonhote, P.Z.S. 1900, p. 873; Kloss, Journ. F.M.S. Mus. II, p. 148 (1908); id. Journ. Straits Branch Roy. Asiat. Soc., No 53, p. 28 (1909).

Mungos exilis peninsulae, Schwarz, Ann. & Mag. Nat. Hist. (8) VI, p. 231 (1910).

The typical locality of *peninsulae* is Bangkok and the range is given as "Malay Peninsula and Lower Siam." Members of the species from Cochin-China and Annam, which are *exilis* Gerv., are stated by Bonhote (P.Z.S., 1907, p. 6) to differ "in their much redder colour from Siamese specimens..... in their much deeper colour from Javanese specimens." To me it appears well to regard animals from all these places as races of *javanicus* (Desm.)

We have no topotypes of *peninsulae* but two animals from the vicinity of Taiping, Perak, appear to be referable to it though their tails are without any dark tip.

Measurements of an adult male (No. 971/13):— Head and body, 364 (371)[1]; tail, 276 (254); hind-foot, 57 (63); ear, 23 (26). Skull:—greatest length, 78.0; basilar length, 69.8; palatilar length, 37.2; length of upper tooth row, $c\text{-}m^2$ (alveoli), 26.6; pm^4, length 7.0, greatest diameter, 7.8; rostral breadth across roots of canines, 13.8; post-orbital constriction, 11.0; breadth of braincase 26.0; zygomatic breadth, 39.2 mm.

Mungos perakensis, *sp. nov.*

Type:—Adult female (skin and skull), F.M.S. Mus. No. 116/14. Collected at Assam Kumbang, near Taiping, Perak, on 14th February, 1912, by E. Seimund.

Characters:—Like *M. j. peninsulae* (antea) but smaller; about the same size as *M. birmanicus* (Thos.) of Burma, *M. rubrifrons* Allen, of Hainan and *M. siamensis* Kloss, of Siam.

[1] Measurements in parentheses those of the second adult male (No. 955/11).

Colour:—Pelage a grizzle of blackish and buff, base of hair dark brown on back, blackish on abdomen. Top of muzzle blackish; top of face and head dark rufous, finely grizzled; lower cheeks ferruginous; median line of back faintly tinged with rufous; fore and hind feet darker and more finely annulated than the body; chin yellowish rusty; undersides of body and limbs less speckled than the back.

Skull and teeth:—Do not differ from *M. birmanicus* or *siamensis*.

Measurements:—Head and body, 316 (328)[1]; tail 236 (253); hindfoot, 58 (54); ear, 24 (24). Skull: greatest length, 69.5; condylo-basal length, 67.3; palate length 36.0 (32.2); upper molar row c-m^2 (alveoli) 24.5 (24.8); pm^4, length 6.8 (6.9), greatest diameter, 7.2 (7.5); rostral breadth above canines, 12.3 (11.7); zygomatic breadth, 33.7 (31.5) mm.

Remarks:—The small size of this species immediately distinguishes it from *M. j. peninsulae* though its colour is almost exactly similar; the dark rufous head separates it from *birmanicus* and its darker colour in general from *siamensis*.

Mungos incertus, *sp. nov.*

Type:—Male skin collected at Ongut, Trang, Siamese Malaya on 3rd February, 1910.

Diagnosis:—Intermediate in size between *M. peninsulae* and *M. perakensis*: pelage longer than in either; head brighter; colour generally rather more rufous, pale annulations coarser; underside of body dull ochraceous, very slightly speckled; base of tail rather ochraceous below.

Measurements:—Head and body, 350 (361)[2]; tail, 276 (265); hindfoot, 63 (62); ear, 20 (22) mm.

Remarks:—I do not know of any species of which this animal is the Malayan representative; it appears to be too large for *M. birmanicus*, etc. Probably belonging to it are two old mounted specimens in the Museums from Perak which I have recorded as *Herpestes auropunctatus birmanicus* (Journ. Straits Branch Roy. Asiat. Soc. No. 53 p. 28, 1909) but it is impossible to say with certainty as they have suffered from exposure and no measurements have been recorded.

[1] Measurements in parentheses those of a young adult female from the same locality (No 116/14).

[2] Measurements in parentheses those of a female from near Taiping, Perak (No. 68/17).

XX. ON TWO NEW PYGMY SHREWS FROM THE MALAY PENINSULA.

By C. Boden Kloss, F.Z.S.

Crocidura gravida, *sp. nov.*

Type (and only specimen examined):—Adult male (skin and skull), F.M.S. Mus. No. 79/17. Collected on Pulau Dayang Bunting,* Langkawi Islands, West Coast Malay Peninsula, on 8th Dec. 1916, by H. C. Robinson.

Diagnosis:—About the same size as *C. klossi*, Robinson, of the Redang Islands, Trengganu (*C. major*, Kloss, preoccupied)† but tail longer and colour much less brown: the greyest of all the known shrews from the Peninsula region. Colour not to be exactly matched by any of Ridgway's examples (Colour Standards and Nomenclature) but nearest to dark Quaker drab, with a tinge of brown strongest anteriorly; rather paler below.

Measurements:—See table on p. 128.

Crocidura tionis, *sp. nov.*

Type:—Adult female (skin and skull) F.M.S. Mus. No. 881/15. Collected on Tioman Island, East Coast Malay Peninsula, on 1st July, 1915, by H. C. Robinson.

Diagnosis:—About the same colour as *C. klossi* but smaller; about the same size as *C. negligens*, Robinson and Kloss, of Koh Samui near Bandon, East Coast Malay Peninsula‡ but browner. General colour effect of upper parts Benzo brown (Ridgway), the hairs having deep neutral grey bases and brown tips: below paler and nearly neutral grey slightly tinged with brownish mesially.

Measurements:—See table on p. 128.

Specimens examined:—Five, all from the type locality

* Pregnant Damsel Island.

† Ann. and Mag. Nat. Hist. (8) vii, p. 117 (1911). Journ. F. M. S. Mus., iv, p. 194 (1911).

‡ Ann. and Mag. Nat. Hist. (8) xiii, p. 232 (1914). Journ. F. M. S. Mus., v, p. 133 (1914).

MEASUREMENTS OF NEW SPECIES OF **Crocidura** in millimetres.

Species.	Sex.	Body. Head and body.	Tail.	Hind foot.	Ear	Skull. Greatest length.	Basal length.	Palatal length.	Maxillary tooth row including incisor.	Lachrymal breadth of rostrum.	Greatest breadth of rostrum.	Mastoid breadth.	Length of mandible including incisor.	No
C. gravida, Type ..	♀	93	84	16	11	22.0	21.0	10.7	11 0	4.6	7.1	9.9	16 0	79/17
C. tionis ..	♀	90	62	15	10	..	..	9.4	10.0	4.2	7.0	..	15.0	665/16
.. ..	♀	80	62	±14	..	..	..	9.1	9.5	4.0	6 6	..	14.1	720/16
.. ..	♀	86	68	15	8 5	21.5	19.2	9.1	9.8	4.2	6.9	9.4	14 8	880/15
.. Type. ..	♀	92	65	15	8	21 6	19.0	9.2	9.9	4.4	7.0	10.0	14.1	881/15
.. ..	♂	92	72	16	9	21.8	19.2	9.7	10.0	4.3	7.0	9.9	14.5	882/15

XXI. ON A COLLECTION OF BIRDS FROM PULAU LANGKAWI AND OTHER ISLANDS ON THE NORTH-WEST COAST OF THE MALAY PENINSULA.

By HERBERT C. ROBINSON, *C.M.Z.S., M.B.O.U.*

The present paper is based mainly on a collection made by Mr. Seimund and myself and a staff of native collectors on the principal islands off the north-west coast of the Malay Peninsula between the parallels of 6° N. and 7° 30′ N. during the months of December and January, 1916–17.

The islands had for the most part been visited by us previously for two or three days at a time and I have in many cases included species obtained on these occasions where the specimens have raised points of any interest. Many species on the other hand, notably hawks and herons, which have been sufficiently dealt with elsewhere are not here mentioned.

The collections are probably fairly exhaustive for the islands of Langkawi and Terutau but are of course very incomplete, for the other islands, which were only visited for two or three days at a time, merely sufficiently long to obtain representative series of the small mammals which were the main objects of our visits.

It will be seen that the avifauna presents the same general characters as those of all the other groups of islands in the vicinity of the Malay Peninsula, namely, a great scarcity of all the more strictly jungle frequenting species belonging to the great family of *Timeliidae*, and the total absence of *Eurylaemidae*, though we find a few species of Trogons, Barbets and Woodpeckers orders which are entirely absent from the islands off the coast of Pahang on the east side of the Peninsula, these islands being smaller in extent and separated from the mainland by broader stretches of deeper water. Owing to the fact that our visit took place in the winter months, migratory flycatchers, thrushes and warblers are well represented, while a considerable number of shore birds were also obtained or observed.

A brief account of the localities visited on the present cruise is appended, while the synonymy has been restricted to narrow limits, only two papers which have some bearing on the localities being usually quoted viz :—

"On birds from the Northern Portion of the Malay Peninsula including the Islands of Langkawi and Terutau; with notes on other rare Malayan Species from the Southern Districts." By Herbert C. Robinson and Cecil Boden Kloss.

Ibis 1910, pp. 659-675, Plate X, and text figure 6, *Ibis* 1911, pp. 10-80, Pl. 1, and text figures 5 and 6, quoted as "Robinson & Kloss."

"Zoological Results of the Swedish Zoological Expeditions to Siam 1911-1912 and 1914-1915, IV, Birds. 11," by Nils Gyldenstolpe.

Kungl. Svenska Vetenskapsakademiens Handlingar. Band. 56, No. 2, 1916, quoted as "Gyldenstolpe."

Pulau Paya. A small rocky island, covered with jungle and without regular inhabitants, about two hundred and fifty feet high, situated about sixteen miles west of the mouth of the Kedah River in Lat. 6° 3′, N. and Long. 100° 3′ E. and separated from the mainland by depths of fifteen fathoms. The island is about a mile in maximum length and about a third of a mile in breadth. It has been visited by us several times, on the last occasion at the end of April 1915, but no birds of any great interest have been obtained on it.

A fruit bat (*Pteropus hypomelanus geminorum*, Miller), only known elsewhere from the Mergui Archipelago, was found to be abundant on it (c.f. *Kloss, antea*, Vol. VI. p. 245 (1916).

Pulau Langkawi. This island, with those immediately adjacent to it, is contained in an area roughly shaped as an equilateral triangle with a side of somewhat over twenty miles between the Latitudes 6° 9′, and 6° 27′ N. and Longitude 99° 38′ and 99° 56′, E, separated from the mainland by a strait ten miles wide at the narrowest part and by depths not exceeding ten fathoms.

The island is extremely rugged in character, though in the neighbourhood of the two principal villages, Kwah and Kuala Malacca, there are considerable areas of flat land devoted to orchards, rice and coconuts and of late years to the inevitable rubber. There is also a large amount of cultivation on the north coast, where a fairly dense population is settled.

Elsewhere the country is very mountainous, the highest hill, Gunong Raya, reaching nearly 3,000 feet, while there is a range of precipitous mountains at the north-west corner well over two thousand feet in height. On the present occasion we spent from the 12-15th December at a place called Burau at the foot of this range, where however no birds of any great interest were obtained.

The geological formation of Langkawi is by no means so generally limestone as is usually assumed and much granite, quartzite, sandstone and other metamorphic rocks also occur. Most of the smaller islets of the group and many of the larger ones are, however, exclusively limestone and it is on these that the many peculiar species of plants belonging to the Langkawi flora are almost entirely to be found though the forest flora generally appears to differ greatly from that of the southern part of the Malay Peninsula. A considerable collection of plants was made at Burau, but here as

elsewhere we were unfortunate in finding most species out of flower.

Dayang Bunting. A small island forming part of the Langkawi group, mainly, though possibly not entirely, of limestone, which in several places attains the quality of marble, white and even in grain, almost saccharine, resembling that found at Lenggong in Upper Perak and decidedly superior to that of the Ipoh Quarries. The island is quite uninhabited and covered with jungle and is nearly everywhere steep-to, though several deep indentations and the heads of bays are filled with mangrove.

The chief point of interest in the island is the fresh water lake which at two places approaches to within a few yards of the shore and is separated from it by a narrow rocky rim of no very great height so that the surface of the lake is probably only a few feet above the level of the sea. In shape it is a long oval 5–600 yards across by 1,100 or 1,200 yards long and is about $4\frac{1}{2}$–5 fathoms deep close to the shore, deepening to 8 in the centre and nowhere exceeding $8\frac{1}{2}$, the depths being fairly regular. The bottom is in places rock but mostly mud. There seems to be only one species of fish in the lake and no fresh water sponges were found round the edges or on twigs and logs afloat in the lake. There is good anchorage near the island at the head of a fiord leading to the best approach to the lake, which however is much encumbered with coral knobs at its head. Fresh water escapes freely through the sand and rocks of the shore and large quantities of excellent quality can be obtained at all seasons by the use of a hose.

With the exception of mousedeer most of the mammals occurring on the main island of Langkawi occur on this one also; no fruit bats were seen and other species were scarce.

Land birds were exceedingly scarce, the only common species being *Cyornis sumatrensis*. There were not many insects about and the few butterflies obtained were of no special interest. A Cicada was heard and sand-flies were only too common.

We did not actually see any *biawak* (*Varanus sp.*) though they must occur. Four species of Draco were very common and we secured one young *Calotes versicolor* and three species of skinks. We also collected three species of frogs of which one was very common at the edge of the lake.

At a considerably higher level than the large lake, the Dyaks came across another pool, much smaller and largely choked with dead and fallen timber. The natives are aware of its existence and state that in the dry season it contains no water at all.

In addition to the zoological collections about 60 species of plants were secured but seem to be of no very great interest. Few of the rock plants were in flower. Orchids

were scarce and *Gesneraceae*, for which we came specially to look, were not conspicuous or interesting and were almost entirely out of flower.

Pulau Terutau. Pulau Terutau lies north of Langkawi, from which it is separated by a channel about five miles in breadth. I have little to add to the brief account of the island given by Mr. Kloss and myself in the Ibis for 1910, pp. 666 et seq.

During our stay on the present visit, which lasted from 17—29th December we circumnavigated the island and landed at several spots on the western shore which is very bold and exposed though there are three large shallow bays with fine beaches. The island is even more sparsely inhabited than it was in 1907 and 1908, but a good deal of timber cutting takes place at intervals. The collections of birds were neither large nor of any great importance but we obtained a number of mammals which were special desiderata of the Museum, including the rare *Petaurista terutaws*, hitherto known only from the type, and a new species of *Arctogalidia*.

Koh Libong or Pulau Telibun. Situated between Lat. 7° 12′ and 7° 18′. N. and Long 99° 31′ and 99° 27′, this island is roughly an equilateral triangle in shape with sides of about six miles. One face is high and rocky with a sandy shore, the maximum height being put in the charts at about 1,450 feet, though this estimate is probably excessive. The high land, which is on the western face, is comparatively narrow and the rest of the island is low and flat, there being a good deal of mangrove in places while further inland there are sandy flats and grassy plains overgrown with *gelam* (*Melaleuca*), several species of tall grass (though *lalang* is quite absent) and a variety of prickly shrubs. The high land is covered with jungle though in places where this has been cleared for hill rice and the like, the landscape has assumed a park-like aspect, very pleasing to the eye after the monotony of the jungle of the southern islands, though by no means so pleasant to traverse. The jungle is open and the undergrowth consists largely of a species of palm, with fan shaped leaves, growing to about fifteen feet in height. Epiphytes generally were scarce and orchids, in contrast to the islets off Terutau and Langkawi, are by no means numerous. In fact the botany generally was of no great interest, doubtless due to the fact that there had been but little rain for some time prior to our visit and few plants were consequently in flower, the most attractive being a small Begonia with rose-pink flowers which grew on damp rocks on the shore, barely above tide marks.

The flat portion of the island being unsuitable for collecting upon and water being there scarce and indifferent in quality, we anchored in a small bight off the N.W. corner of the island where there was a small stream of excellent water and a fine, sandy beach backed by good jungle. We

collected here from December 31st to January 4th, and besides the mammals actually secured, which will be dealt with later, obtained evidence of the existence of a form of *Cervus equinus* (rusa) which is very dark in colour and of a species of *Paradoxurus* (musang).

A very small bat, probably an *Emballonura*, was seen round a flowering tree after dark, while the *orang laut* or coast aboriginals told us that there were many of the larger *kluang* (*Pteropus*) among the mangroves at certain times of the year, though none were to be found at the time of our visit.

Neither Pig, Mouse deer or the Lotong (*Pithecus obscurus*) are found on the island.

The strait separating the island from the mainland is barely a mile wide at its narrowest part and carries less than ten feet of water at low tide and it is therefore at first sight surprising that the island forms of the mammals should differ to the extent that they undoubtedly do from the mainland stocks. It seems probable, however, that the lower land forming the eastern part of the island is of very recent formation and that Telibun, in times geologically very recent was separated from the mainland by a deeper and wider strait than is at present the case.

Birds, as our lists show, were few in number and not particularly interesting in species.

From the evidence of the rocks on the shore it would appear that the island is in part composed of sandstones and other similar formations though many of the higher peaks seem to be limestone.

Koh Muk or Pulau Muntia. A small island, roughly circular or quadrangular in shape, about 6 miles NNW. of Telibun and separated from it and the mainland by depths not exceeding four fathoms. The WNW. and SW. parts of the island consist of precipitous limestone bluffs coming down sheer into the sea, the maximum height of the island being about a thousand feet. The E. and SE. sides however, are low and sandy and there is good anchorage for small craft in the SE. bay in about three fathoms. The western face is much fissured by caves, some of considerable size, in which esculent swallows breed in great numbers while others are inhabited by bats (*Taphozous melanopogon fretensis*, Thomas). Some of these caves appear to have been used as places of sepulture, as we came across fragmentary human bones in more than one of them, but this fact has already been noted by Annandale who has described skeletons collected by him in the vicinity.

At the time of our visit from 4-8th January 1917, there having been little rain for over six weeks, the island was deficient in good water. There are several *orang laut* clearings on the eastern side of the island, which is much frequented for fishing purposes and for the collection of beche-de-mer or trepang

(*Holothuria* spp.) which is extraordinarily abundant in the sandy bays in from three to five fathoms.

Besides the species of mammals actually obtained the *kra* monkey, *Macaca irus*, is fairly common, while Seimund came across a large specimen of *Felis temmincki*, feeding on a big hawk. Our *orang laut* pilot showed us a cranny in the rocks in which this "rimau" regularly bred. Tracks of otter were also noted in abundance.

Birds were more numerous than on most of the other smaller islands visited by us, especially green pigeon and the very handsome woodpigeon. *Columba punicea*.

KOH KADAN or PULAU PAPAN. A long, narrow island, about two miles long by a quarter to half a mile broad, about eight miles WNW. of the northern end of Pulau Telibun and about five miles SW. of Pulau Muntia. The island is wooded, about 200 feet high, with a sandy beach on the eastern side but steep-to on the western, with a long reef extending for four or five miles from its southern extremity. We spent one night only there 7-8th January 1917, and found nothing of any interest, the only mammal being a race of *Epimys rattus* and the only land birds, Crows and Koels (*Eudynamis malayana*).

KOH KYAN or PULAU NIOR, S'TALI and KOH NGAI or PULAU KUDA. Two precipitous limestone islets about five miles due north of Pulau Papan and about four miles west of Pulau Muntia. They are thin clothed with vegetation, the trees being largely species of *Ficus* and other epiphytic forms and at certain times of the year are said to be frequented by myriads of White Imperial Pigeon (*Myristicivera bicolor*) though at the time of our visit in January the only land birds on them were swallows (*Hirundo javanica*) and species of *Collocalia* and *Cypselus*. Pulau Kuda however was inhabited by enormous numbers of a small species of *Pteropus* which hung in clusters to the cracks in the vertical cliffs and to the branches of the small stunted trees growing therefrom.

PULAU LONTAR. A large island about sixteen miles long by four miles wide, situate between latitude 7° 29′ and 7° 44′ N. and Longitude 99° 2′ and 99° 7′ E. On the western side it is steep to, but on the east there are plains of considerable extent. In the middle it is divided by a shallow strait broadly bordered with mangrove. In the centre the land rises to a considerable altitude, certainly over a thousand feet, and is covered with jungle, which however has been much cut out for temporary cultivations.

The population is considerable, mainly Samsams *i.e.* of mixed Malay-Siamese stock with a strong infusion of *orang laut*. We spent a few days anchored off the principal village, a place of some size with numerous Chinese shops, known as Pasir Raja. The coast however in this vicinity is fronted by a broad bank of very soft mud which is only passable at half tide by small boats, though a jetty some three hundred yards in length traverses part of it.

During our stay from January 9-12th, a very strong easterly wind, which only dropped for a few hours in the early morning, forced us to lie under the lee of a small island, Pulau Depok, some three miles distant from the settlement, and on several occasions we were nearly swamped in getting to and leaving the main island.

We obtained a large series of mammals including a lotong and a kra, a mousedeer, musang and tangelin, and rats and squirrels of several species.

Such birds as were obtained show that the fauna is of mainland rather than insular facies as the occurrence of such genera as *Calorhamphus* and *Phyllornis* indicates. Peafowl are said to occur though we did not obtain any, Buffalo, both feral and domesticated are common, and tiger are occasionally met with while serow (*Nemorrhoedus*) are abundant on a limestone island between Pulau Lontar and the shore. The main island appears to have but little limestone on it while Pulau Depok, near which we were anchored, was of sandstone, but many islets in the vicinity, especially to the NE., were of the characteristic limestone formation.

1. Treron curvirostra nipalensis (Hodgs.)

Treron nipalensis *Salvad. Cat. Birds Brit. Mus.* xxi, p. 34 (1893); *Robinson and Kloss*, p. 674; *Robinson, antea*, vol. V, p. 141.

Treron curvirostra nipalensis, *Baker. Indian Pigeons and Doves*, p. 66, pl. 5 (1913); *Robinson, Ibis*, 1915, p. 721; *Gyldenstolpe*, p. 153.

a. ♂. vix ad. W. side Pulau Telibun. Trang, S.W. Siam, 31st December, 1916. [No. 3797.]

"Iris dull blue, inner ring pink, orbits verditer green, bill yellow, the base crimson, feet crimson."

Fairly common both on this island, Langkawi and Terutau, though these latter specimens as also birds from Trang, are decidedly nearer the typical T. *curvirostra curvirostra* from Sumatra.

2. Osmotreron vernans (Linn.)

Salvad. tom. cit. p. 60; *Robinson and Kloss*, p. 674; *Robinson, antea*, vol. V, pp. 88, 140; *Robinson, Ibis*, 1915 p. 723.

a. ♂. Lem Pia, north side Telibun Straits, Trang, S.W. Siam. 3rd January, 1917. [No. 3835.]

b. c. ♂, ♀. Telok Wau, Terutau. 24 28th. December, 1916. [Nos. 3725, 3773.]

"Iris outer ring pink, inner blue, feet pinkish maroon, bill greenish grey."

Very common on all the islands and on the adjacent mainland.

3. Carpophaga aenea aenea (Linn.).

Salvad. tom. cit. p. 190; *Robinson, antea*, vol. V, p. 141 (1915); *Robinson, Ibis*, 1915, p. 723; *Gyldenstolpe*, p. 155.

a. ♀. Telok Wau, Terutau. 24th December, 1916. [No. 3731.]

b. ♂. Koh Muk (Pulau Muntia, Trang, S.W. Siam, 7th January, 1917. [No. 3910.]

"Iris dark red, bill slate, feet maroon."

The Bronze Imperial Pigeon was fairly common in all the islands at the time of our visit but hard to get, as it was not flighting and always flew extremely high. The pair preserved are distinctly larger than those obtained in S.E. Siam by Mr. Kloss; wing 235 mm. against 209, but several names are available both for the eastern and southwestern races, if separated. All the Malayan birds belong to the typical Linnean race, whose type locality has been designated by Hartert as the Lesser Sunda Islands.

4. Columba punicea (Tick.).

Columba punicea, *Salvad. tom. cit.* p. 306; *Robinson and Kloss*, p. 674.

Alsocomus puniceus, *Stewart Baker, Indian Pigeons and Doves*, p. 176, Pl. 18 (1913); *Gyldenstolpe* p. 151.

a-c. 2♂, ♀. Koh Muk (Pulau Muntia), Trang, S.W. Siam. 4-5th January, 1917. [No. 3841, 2, 3858.]

"Iris, inner ring yellow, outer orange shading into the inner ring, orbits plum, bill plum at base, whitish horn at tip, feet pinkish maroon.

Two of these birds sexed male have the cap, pale pearly white very sharply defined, the bird marked female having it dull slate. A specimen from Terutau however which is sexed female in all respects resembles the males so that Stewart Barker is probably correct in his statement that the sexes, when fully adult, are identical in colouration. One male has the undersurface amethystine grey, not a somewhat vinaceous chestnut as in the other specimens.

This magnificent pigeon was very common on Koh Muk during the three days we were there, though they only appeared at dusk, probably from the adjacent mainland, roosting in tall mangroves a little way back from the beach in parties of thirty or forty. As Bingham describes it, the note is a booming coo somewhat like that of *Carpophaga aenea* but not nearly so loud or deep.

5. Streptopelia suratensis tigrina (Temm.)

Turtur tigrinus (Temm. and Knip.) *Salvad. tom. cit.* p. 440; *Robinson and Kloss*, p. 675; *Robinson, antea*, vol. V, pp. 88, 142.

Streptopelia suratensis tigrina, *Stewart Baker, Indian Pigeons and Doves*, 121, pl. 11 (1913); *Robinson, Ibis*, 1915, p. 724; *Gyldenstolpe*, p. 149.

a. ♀. Pasir Raja, Pulau Lontar, S.W. Siam. 11th January, 1917. [No. 3883.]

"Iris pinkish yellow, orbits dirty white, bill dark blackish horn, feet dull lake."

Very common on Pulau Lontar, also on open spaces on Koh Muk and Pulau Terutau and extraordinarily abundant along the coast of Trang.

Wing 145 mm. slightly larger than most southern specimens.

6. Geopelia striata (Linn.)

Salvad. tom. cit. p. 458; *Ogilvie Grant, Fascic. Malay Zool.* iii. p. 121 (1905). *Gyldenstolpe*, p. 150.

a. ♂. Pasir Raja, Pulau Lontar, S.W. Siam. 12th January, 1917. [No. 3901.]

"Iris white, orbits yellowish green, bill bluish slate, feet pinkish violet."

Williamson and others have remarked that this little dove is very rare in Siam proper. It is however common over practically the whole of the Peninsula to its northern extremity in suitable localities. We did not however observe it on Langkawi and Terutau, though I have little doubt that in occurs on the large open areas on the north of the former island.

7. Chalcophaps indica (Linn.)

Salvad, tom. cit. p. 514; *Robinson and Kloss*, p. 675 *Robinson, antea*, vol. V, pp. 88, 141 (1915). *Gyldenstolpe*, p. 150.

a. ♂. Sungei Udang, Terutau. 8th March, 1909. [F.M.S. Mus. No. 439/09.]

Evidently not very common on the group as the above specimen is the only one that has been obtained in the course of our visits to the islands.

8. Rallina fasciata (Raffles).

Sharpe, Cat. Birds Brit. Mus. xxiii. p. 75 (1894); *Robinson, antea*, vol. V, p. 88 (1915).

a. ♂. Pulau Terutau. November 1st 1913.

Found abundantly in the adjacent states of Perlis and Kedah in October and November, 1911, but very much rarer in the more southern parts of the Peninsula.

9. Rallina superciliaris (Eyton).

Sharpe, tom. cit. p. 76; *Robinson and Kloss*, p. 10; *Robinson, antea*, vol. VI, p. 225 (1916).

a. ♀. Ulu Malacca, Pulau Langkawi, 17th February, 1909. [F.M.S. Mus. No. 445/09.]

Very much rarer than the preceding species.

10. Amaurornis phoenicura chinensis (Bodd.).

Stresemann, Nov. Zool. xx, p. 304 (1913); *Robinson, antea*, vol. V, p. 141 (1915); *id. Ibis*, 1915, p. 725; *Gyldenstolpe*, p. 148.

Amaurornis phoenicura, *Sharpe. tom. cit.* p. 156; *Robinson & Kloss*, p. 11.

a. ♂. Kuala Kubong Badak, Pulau Langkawi, 17th March, 1909. [F.M.S. Mus. No. 444/09.]

Wing, 162 mm.

11. Arenaria interpres (Linn.).

Sharpe, tom. cit. p. 92.

Strepsilas interpres, *Ogilvie Grant. Fascic. Malay. Zool.* iii, p. 119 (1905).

a. ♂. Koh Muk (Pulau Muntia) Trang, S.W. Siam. 4th January, 1917. [No. 3846.]

"Iris dark hazel, bill greenish black, legs yellowish orange."

The Turnstone is by no means a common bird on the Malayan coasts and few specimens are on record, though it occasionally occurs in large flocks.

12. Sarcogrammus indica atrinuchalis (Jerdon).

Sarcogrammus atrinuchalis, *Sharpe, Cat. Birds Brit. Mus.* xxiv, p. 152 (1896); *Robinson and Kloss*, p. 11; *Robinson, antea*, vol. V, pp. 88, 142.

Sarcogrammus indica atrinuchalis, *Robinson, Ibis*, 1915, p. 725; *Gyldenstolpe* p. 142.

a. ♀. Telok Wau, Terutau. 17th December, 1916. [No. 3651.]

"Iris hazel, bill and wattles pale crimson, anterior half of bill black, tarsi pale yellow."

Very common throughout the northern half of the Peninsula extending further to the south on the Eastern side, and along the Pahang River, possibly because there is more open ground, suitable for the species in these districts.

13. Squatarola helvetica (Linn.)

Sharpe, tom. cit. p. 182.

Squatarola squatarola, *Gyldenstolpe*, p. 143.

a. ♀, Koh Muk (Pulau Muntia) Trang, S. W. Siam. 5th January, 1917. [No. 3857.]

The Grey Plover is not such a rare visitor to the coasts of Siam and the Malay Peninsula as Gyldenstolpe's note would

imply. It can generally be met with in Klang Straits during the months November to February and has also been noted at numerous other localities between Malacca and the Kedah River.

14. Ochthodromus mongolus pyrrhothorax (Gould).

Ochthodromus pyrrhothorax, *Sharpe, tom. cit.* p. 226; *Robinson and Kloss*, p. 12, *Robinson, antea*, vol. V, p. 142 (1915).

Aegialitis mongolicus, *Ogilvie, Grant. Fascic. Malay. Zool.* iii, p. 118 (1906).

Ochthodromus mongolus, *Gyldenstolpe*, p. 144.

a–b. 2 ♀. Koh Muk (Pulau Muntia) Trang, S. W. Siam. 4th January 1917. Nos. 3843, 4.

"Iris dark hazel, bill black, feet dirty slate."

I am doubtful if the typical race of this plover, for this form is not more than a subspecies, is ever found west of North Borneo. I have certainly, with one very doubtful exception, seen none from any part of the Malay Peninsula, all being referable to the present race which, as Sharpe points out, has a slightly longer tarsus.

15. Aegialitis alexandrina peroni (Bp.)

Aegialitis peronil (Bp.); *Sharpe, tom. cit.* p. 274; *Gyldenstolpe*, p. 144.

Aegialitis alexandrina, *Robinson, antea, vol.* V, p. 142; *vol.* VII, p. 70 (1916).

a–b. ♂ ♀ ad. Burau, N. W. Langkawi, 23rd April, 1911.

c. ♀. W. side Pulau Telibun, Trang, S. W. Siam. 2nd January, 1917. [No. 3815.]

"Iris dark hazel, bill black, feet slate."

Until Gyldenstolpe, *(loc. cit.)* identified a pair of plovers obtained at Koh Lak in Peninsular Siam as this species I had hitherto regarded our fairly considerable series as a tropical resident race of *Ae. alexandrina*, which indeed it is.

Seven males from various parts of the Peninsula have a wing of 93–99 mm. and eight females 93–100 mm.

A series from Borneo, the loan of which we owe to the kindness of the Sarawak Museum authorities has the wing in four males 91–94 mm. and in three females (one very worn) 88–94 mm. so that the Peninsular race would appear to be slightly larger. In addition the Peninsular birds have the dark loral streak much less strongly developed, while the feathers of the mantle are somewhat paler with lighter edgings; the white at the base of the inner primaries is also more extensive. Material from Java and from Timor, which is probably the typical locality, is however required before the mainland race can safely be separated.

Chicks in down, with the parents, were obtained at Tanjong Tombak, Pulau Bintang, Rhio Archipelago on 5th June, 1908.

16. TEREKIA CINEREA (Guldenst.)

Sharpe, tom. cit. p. 474; *Robinson and Kloss*, p. 13.

a. ♂. Kuala Kubong Badak, Langkawi, 18th March, 1909.

b. ♀. Telok Apau, Pulau Langkawi, 14th December, 1912.

Very common everywhere along the coast, wherever there are suitable feeding grounds, during the winter months.

17. TOTANUS CALIDRIS, Linn.

Sharpe, tom. cit. p. 474; *Robinson and Kloss*, p. 12; *Robinson, Ibis*, 1915, p. 725; *Gyldenstolpe*, p. 145.

a. ♂. Telok Apau, Langkawi. 11th December, 1912.

Very common also at Koh Muk (Pulau Muntia) in January, 1917.

18. TRINGOIDES HYPOLEUCOS (Linn.).

Sharpe, tom. cit. p. 456; *Robinson and Kloss*, p. 13; *Robinson, Ibis*, 1915, p. 725; *Gyldenstolpe*, p. 146.

a. ♂. W. side Pulau Telibun, Trang, S. W. Siam. 2nd January, 1917. [No. 3816].

"Iris dark, bill greenish slate, feet slate darker at the joints."

Common everywhere in the Peninsula in suitable localities.

19. GLOTTIS NEBULARIUS (Gunn.).

Sharpe, tom. cit. p. 481; *Robinson and Kloss*, p. 13; *Robinson, Ibis*, 1915, p. 725; *Gyldenstolpe*, p. 146.

a. ♀. Koh Muk (Pulau Muntia) Trang, S.W. Siam. 4th January, 1917. [No. 3836].

"Iris hazel, bill grey, feet greenish grey, darker at joints."

The Greenshank is common in suitable localities throughout the coasts of Siam and the Malay Peninsula though not so abundant and very much shyer than the Redshank.

20. RHYACOPHILUS GLAREOLA (Gm.).

Sharpe, tom. cit. p. 491; *Robinson and Kloss*, p. 13 *Gyldenstolpe*, p. 146.

a. ♀. Pulau Langkawi. 11th February, 1909 [F.M.S. No. 333/09.]

b. ♂. Ulu Malacca, Pulau Langkawi. 18th December, 1912.

Not very common anywhere in the Malay Peninsula but apparently more abundant in the northern parts.

21. Gallinago stenura (Bonap.).

Gallinago stenura, *Sharpe, Cat. Birds Brit. Mus.* xxiv, p. 619; *Grant Fascic. Malayenses, Zool.* iii, p. 117 (1906); *Robinson and Kloss, Ibis*, 1911, p. 14.

a. ♂ ad. Langkawi Id. 10th February, 1909.

b. ♂ ad. Langkawi Id. 18th March, 1909.

c. ♂ ad. Langkawi Id. 25th April, 1915.

A winter visitor in very large numbers to the Malay Peninsula where also *G. cœlestis* and *G. megala* are also occasionally met with.

22. Xenorhynchus asiaticus (Lath.).

Ogilvie Grant, Cat. Birds Brit. Mus. xxvi, p. 310 (1898); *Gyldenstolpe*, p. 140.

a. ♀. North side of Telibun Straits, Trang, S.W. Siam. 1st January, 1917. [No. 3808].

"Iris chrome, orbits black, bill black, gular skin crimson lake mottled with black, lores mottled crimson and black feet deep salmon pink."

This specimen was one of a pair that frequented the shore in the neighbourhood of the seaward entrance to the Telibun Straits and which was eventually shot on a sandy lagoon near the sea. The nest, a very large and untidy structure of sticks, was built on a ledge some distance up a precipitous limestone crag. It contained four eggs, which were obtained for us by one of the local "orang laut," a primitive coast-tribe, who are very clever and daring cliff climbers. One was unfortunately broken in the descent. The remaining three were rather hard set, the shells dull or slightly glossy white, heavily pitted especially towards the smaller end. The outline is variable one being much more pointed than the other two.

Measurements.—A 71·5 × 54 mm.
B 70 × 52
C 71 × 52·5

The occurrence of the species in the Malay Peninsula has hitherto rested in three specimens from "Penang," in the British Museum, collected by Cantor. The locality given is almost certainly incorrect and the specimens must either have been aviary birds or collected on the adjacent mainland, probably in Perlis or Trang.

23. Graptocephalus davisoni (Hume).

Sharpe, Cat. Birds Brit. Mus. xxvi, p. 14 (1898); *Robinson and Kloss*, p. 17; *Robinson, antea*, vol. V, p. 89 (1915).

(?) Thaumatibis gigantea, *Williamson, Journ. Nat. His. Soc. Siam*, II, p. 72 (1916).

a. ♂ ad. Pasir Raja, Pulau Lontar, S. W. Siam. 10th January, 1917. [No. 3882].

"Iris orange, crown dark indigo, occiput and ring round neck livid whitish blue, feet deep lake, bill horn."

This bird was one of a pair frequenting an open grassy plain interspersed with bushes near the sea. They were not particularly shy and with a little care were easily approached. It is evidently this species and not *Thaumatibis gigantea*, a much larger bird which was observed by Williamson at Sarahett on the Petchaburi River (*loc. cit. supra*).

Total length 802; wing 422; tail 210; tarsus 97; bill from gape 165 mm. measured in the flesh.

24. Sterna fluviatilis tibetana, Saunders.

Sterna tibetana, *Saunders, P.Z.S.* 1876, p. 649; *Blanford, Stray Feath*, V, p. 485 (187): *Hume. op. cit.* viii, p. 158 (1879); *Sharpe, Hand-l. Birds*, i. p. 135 (1899).

Sterna fluviatilis, *Saunders, Cat. Birds, Brit. Mus.* XXV, p. 60, spm. *f.* (Selangor) (1896); *Blanford, Faun. Brit. Ind.* Birds, iv. p. 318 (1898).

Sterna longipennis, *Saunders, Cat. Birds Brit. Mus.* XXV, p. 69 (spms. *u, v. w*, from *Tonka and Malacca* (1896); *Blanford, tom. cit.* p. 319 (1898); *Robinson, Journ. Fed. Malay States Mus.* ii, p. 69 (1907); *id. Hand-l. Birds Malay Penins.* p. 3 (1910).

a ♀ imm. Pulau Terutau. 29th November, 1912.

This race of the European tern, *St. fluviatilis* is not uncommon in the Straits of Malacca from the end of July to January but hitherto only immature specimens have been obtained so that the identification must remain somewhat uncertain. The distinctly reddish fect of the considerable number of fresh specimens that I have examined would appear to exclude *St. longipennis*, Nordm., while the fact that the wing of the majority of Malayan birds exceeds 11 inches (275 mm.) tends to show that our birds cannot be referred to the European *St. fluviatilis fluvatilis*.

25. Sterna sumatrana, Raffles.

Sterna sumatrana, *Raffles, Trans. Linn. Soc.* xiii, p. 329 (1822); *Hume & Davison, Stray Feath.* vi, p. 403 (1878).

Sterna melanauchen. *Saunders, tom. cit.* p. 126; *Robinson, antea*, vol. V, pp. 18, 142 (1913-5).

a, b. ♂, ♀ ad. Pulau Langkawi. 27th April, 1915.

Fairly common in the seas round Pulau Langkawi.

There seems little doubt that Raffles' description of *sumatrana* applies to a young bird, little more than a nestling, of this species and that his name will therefore have to displace the generally used *S. melanauchen*.

26. Thalasseus bergii pelecanoides (King).

Sterna pelecanoides. *King, Survey. Intertrop. and Western Coasts Australia*, ii, p. 422 (1827).

Sterna bergii, *Saunders, Cat. Birds Brit. Mus.* xxv. p. 89 (1896); *Robinson & Kloss* p. 11.

Thalasseus bergii edwardsi. Mathews, *Oberholser Proc. U. S. Nat. Mus.* 49, p. 520 (1915).

Thalasseus bergii pelecanoides, *Oberholser, loc. cit.* p. 523.

Sterna bergii pelecanoides, *Robinson, antea*, p. 70.

a-c. 1 ♂ *west.*, 2 ♀ *hiem.* Pulau Langkawi, February and March.

d-e. 2 ♂ *west.* Pulau Terutau, March.

The specimens dated February and March, which are in full or incipient breeding plumage have the mantle decidedly darker grey than the others or than any of a considerable series in the F.M.S. Museums from the Straits of Malacca southwards to Singapore and from Tioman on the East coast of the Peninsula. The wing in the five specimens ranges from 328—355 mm. and the exposed culmen from 59—61, but the shorter winged birds as is so frequently the case in terns have the tips of the primaries abraded.

The majority of the more southerly specimens, notably those from Tioman, appear to have a larger bill, 61—64 mm. though two are smaller than any of the above specimens from Langkawi etc. measuring 56 mm.

I have in part followed Stresemann (*Nov. Zool.* XXI) in not admitting the validity of *T. b. edwardsi*, Mathews (types from Ceylon) regarding it on the strength of the above specimens from Langkawi merely as a transitional form between *T. b. velox* (Cretzsm.) from the Red sea, and *T. b. pelecanoides* (King) from Australian Seas and not worthy of even a subspecific name. In any event I think that the specimens from the extreme south of Tennasserim listed as *edwardsi* by Oberholser would in all probability be referable to *T. b. cristatus* from China if that form is to be kept distinct from *T. b. pelecanoides*, which is extremely doubtful.

27. Ninox scutulata scutulata (Raffles).

Ninox scutulata *(part.) Robinson and Kloss*, p. 31; *Gyldenstolpe*, p. 121.

Ninox scutulata scutulata (Raffles) *Hartert, Vog. Palaarkt. Faun.* II. p. 992 (1912).

a. ♀. Pulau Dayang Bunting, Langkawi, 8th December, 1916 [No. 3605.]

b. ♀. Pasir Raja, Pulau Lontar, S. W. Siam. 12th January, 1917 [No. 3893.]

"Iris chrome or lemon, bill horn, cere olive green, feet pale chrome, claws greyish horn."

Examination of the fairly considerable series of Hawk Owls in the Federated Malay States Museums show that they are readily divisible into two series:

(*a*). A larger form with darker, duller upper surface, the head somewhat greyer than the rest of the upper parts, the white stripes on the under surface more conspicuous. The specimens are dated from October to March and therefore the race is probably only a winter visitor in the Malay Peninsula.= *Ninox scutulata scutulata* (Raffles).

(*b*). A smaller form with browner upper surface and no distinguishable cap; white stripes on the undersurface less conspicuous. Specimens dated from March to August and therefore, as Hartert surmises, probably a resident form=*Ninox scutulata malaccensis* (Eyton).

Specimens in the Federated Malay States Museums:—

Ninox scutulata scutulata (Raffles).

a. ♀. Pulau Lontar, S.W. Siam. January. Wing, 216 mm.

b. ♀. Pulau Dayang Bunting, Langkawi. December. Wing, 200 mm.

c. ♂. Ginting Bidei. Selangor. October. Wing, 215 mm.

d. ♀. Batang Padang, South Perak. February. Wing, 224 mm.

e–f. ♂. Pulau Jarak, Straits of Malacca. March and December. Wing, 217, 214 mm.

g. ♂. Pulau Jemor, Aroa Ids., Straits of Malacca. October. Wing, 214 mm.

Ninox scutulata malaccensis (Eyton).

h–j. 2 ♂, ♀ Pulau Battam, Rhio Archipelago. July. Wing, 186, 186, 189 mm.

k–l. (?), ♂. Pulau Karimon, Rhio Archipelago. July. Wing, 188, 189 mm.

m. ♀. Changi, Singapore Id., July. Wing, 195 mm.

n. ♂. Kuala Lumpur, Selangor. March. Wing, 187 mm.

o. ♂. Rawang, Selangor. August. Wing, 186 mm.

p. ♀. Tanjong Malim, Perak. April. Wing, 201 mm.

q. ♂. Langkawi. March. Wing, 196 mm.

Ninox scutulata borneensis (Bp.).

r. ♀. Sungei Paku, Seribas, S.W. Sarawak, Borneo. October. Wing, 172.

28. Otus bakkamoena lettia (Hodgs.).

Gyldenstolpe, p. 120; *Hartert, Vog. Palaarkt. Fauna*, II. p. 975 (1913).

a–b. 2 ♀. Pulau Dayang Bunting, Langkawi. 7–10 December, 1916 [Nos. 3602, 3618.]

"Iris brown, bill pale greenish horn, tarsi white, tinged with greyish pink, claws pale horn."

After comparison with a considerable number of specimens of this group from all parts of the Malay Peninsula, south to Singapore Id. and from Sumatra and Borneo I have come to the conclusion that these two birds must be provisionally referred to this race described by Hodgson from the Eastern Himalayas. The toes are slightly, though not very markedly, more feathered than in the southern birds but the size wing 171 and 166 so much exceeds that of any specimen of *O. b. lempiji* (Horsf.) that it is impossible to identify them with that form whose wing never exceeds 157 mm. The two specimens differ widely *inter se*, one having the forehead largely buff while the colour beneath is deeper with strongly marked dark shaft stripes to the feathers of the belly while the other is much paler with transverse vermiculations on the feathers of the belly. I have seen birds closely resembling them both from Bangkok and North Siam and comparison is required with the Hainan form, *O. b. umbratilis*, (Swinh.) and with that from Formosa and South China, *O. b. glabripes* (Swinh.).

The present specimens have of course nothing to do with *Otus sagittatus* (Cass.) of which we have a specimen from Negri Sembilan.

These owls were very common on Dayang Bunting and their hooting was heard throughout the night. They had probably come south on migration as *O. B. lempiji* also occurs in the same region.

29. Otus bakkamoena lempiji (Horsf.).

Scops lempiji, *Sharpe, Cat. Birds Brit. Mus.* II. p. 91 (1875); *Robinson and Kloss* p. 31: *Robinson, antea*, vol. V, p. 91 (1915).

a. ♀. Sungei Kilim, Langkawi, 25th March, 1909.

This bird is typical *O. b. lempiji* having a wing of 156 mm.: another female from Bandon has the wing 152 and a male from Perlis about 150 mm. These last two were obtained in June and November respectively and probably represent the resident race.

30. Otus scops malayana (Hay).

Scops malayana, Hay; *Sharpe, tom. cit.* p. 58; *Robinson and Kloss*, p. 31; *id. antea, vol.* VI, p. 226 (1916).

We obtained a pair on Langkawi in February, 1909. Apparently not uncommon towards the north of the Peninsula but very rare in the south.

31. Pelargopsis amauroptera (Pears.).

Sharpe, tom. cit. p. 97; *Robinson and Kloss*, p. 33.

Ramphalcyon amauroptera, *Oberholser, Proc. U. S. Nat. Mus.* xxxv. p. 661 (1909).

a–c. 3 ♂. Sungei Udang, Terutau, 11–16th March, 1909.

d. ♂. Pulau Dayang Bunting, Langkawi, 7th December, 1916. [No. 3601.]

"Iris greyish hazel, bill, tarsi and eyelids vermilion, claws greyish horn."

This handsome Kingfisher was fairly common on Langkawi and very abundant at Telok Wau, Terutau, though it was not met with outside the narrow littoral belt of mangrove. It has not as yet been recorded from any locality east of the Malay Peninsula, and Langkawi is its southernmost limit. In my experience, even when alarmed it is a very much more silent bird than others of its congeners. Total length 365 mm.

32. Alcedo ispida bengalensis, Gn.

Robinson, Ibis, 1915, p. 730; *Gyldenstolpe*, p. 115.

Alcedo bengalensis, *Robinson and Kloss*, p. 32.

Alcedo ispida (*part.*) *Sharpe, tom. cit.* p. 141.

a. ♂. Pulau Paya, between Langkawi and Kuala Kedah, 25th April 1915.

b. ♀. Pulau Dayang Bunting, Langkawi. 8th December 1916. [No. 3604].

c. ♀. Telok Wau, Terutau. 28th December 1916. [No. 3, 779].

d. ♀. W. side, Pulau Telibun, Trang. 3rd January, 1917. [No. 3824].

"Iris dark, upper mandible dark horn, lower reddish or pale vermilion, feet richer vermilion or coral, iris dark or hazel."

Fairly common all along the coast.

33. Alcedo meninting, Horsf.

Sharpe, tom. cit. p. 138; *Robinson and Kloss*, p. 32.

a. ♂. Sungei Udang, Terutau, 8th March 1909. [F.M.S. Mus. No. 449/09.]

This species does not appear to occur in any part of Siam proper or in French Indo-China. In the Peninsula it is very widely distributed but nowhere at all common.

34. Ceyx tridactyla (Pall.)

Sharpe, tom. cit. p. 174; *Robinson and Kloss*, p. 33; *Gyldenstolpe*, p. 114.

a. ♂. Sungei Kilim, Pulau Langkawi, 23rd March 1909. [F.M.S. Mus. No. 447/09.]

b. ♀. Kuala Kubong Badak, Pulau Langkawi, 19th March 1909 [F.M.S. Mus. No. 448/09.]

c. ♀. Telok Wau, Pulau Terutau. 21st December 1916. [No. 3710].

Not very scarce in heavy jungle throughout the peninsula.

A careful examination of the whole series of this genus from the Malay Peninsula in the Museums, together with four specimens from Borneo, does not bear out Mr. Hartert's contentions that three species, viz. *C. tridactyla* (Pall.), *C. rufidorsa* (Strickl.)=*C. euerythra* Sharpe and *C. dillwyni*, Sharpe occur in the Malay Peninsula.* The first two, of course do, though I am inclined to think that the existence of a dark blue post-auricular spot in the type of *C. rufidorsa* proves that it is really an immature *C. tridactyla* and that the proper name for the red-backed form is, after all, *C. euerythra* Sharpe (type from Klang, Selangor). Specimens from the Malay Peninsula which at first sight appear to agree with Mr. Hartert's diagnosis of *C. dillwyni* on closer examination resolve themselves into immature *C. tridactyla* or sub-adult *C. rufidorsa*. The specimens from Borneo in the Museum are all *C. rufidorsa* with no dark frontal spot, no post auricular blue patch, and the wing coverts mainly rufous.

Parrot,† in some very confused remarks on the subject, has founded another subspecies of *C. rufidorsa*, *C. r. robusta*, on a specimen from Sumatra without sex or exact locality, which he suggests may be a mountain form. It has a wing of 62, which seems its main claim to distinction. There is also an insufficiently described "species"‡ from East Sumatra.

35. Carcineutes pulchellus (Horsf.).

Sharpe, tom. cit. p. 198; *Robinson and Kloss*, p. 34; *Robinson, antea*, vol. V. p. 92; *Robinson*, p. 732.

a. ♂. Kuala Kubong Badak, Langkawi, 17th March, 1909. [F.M.S. Mus. No. 487/09.]

b. ♀. Sungei Kilim, Langkawi, 22nd March, 1909. [F.M.S. Mus. No. 489/09.]

Very much rarer in the north of the Peninsula than in the states further south.

36. Halcyon cokomanda coromanda (Lath.).

Halcyon coromandus (Lath.); *Sharpe, tom. cit.* p. 217; *Robinson and Kloss*, p. 34.

* Nov. Zool. VIII. pp. 429–430 (1902)

† Abhandl. der K. Bayern Akad. der Wissensch. II. Kl. XXIV. Bd. I. p. 208 (1907).

‡ *Ceyx enopygius*, Oberholser, Smiths. Misc. Coll. vol 60. p. 7 (1912) (Aru Bay, East Sumatra).

Entomothera coromanda coromanda, *Oberholser, Proc. U. S. Nat. Mus.* 48, p. 642 (1915).

Halcyon coromanda coromanda, *Gyldenstolpe*, p. 116.

a–b. ♂ ♀ ad. Kuah, Pulau Langkawi. 28th April, 1915.

c d. ♂ ♀ ad. Sungei Udang, Pulau Terutau. February, March, 1909.

The two males have the wing, 105, 110 mm. and the females 108, 111 and are slightly darker than two females from Trang and Selangor which have the wings 116 and 113 mm. A slightly immature male shot in November on Pulau Jemor, Aroa Ids. in the middle of the Straits of Malacca has the wing 113 mm.

Oberholser (*loc. cit.* p. 642) considers the species as "strictly resident" but it is probable that like many other purely intertropical species it performs migrations of limited range. I am therefore inclined to doubt the validity of the race established for Sumatra (East and West), and Banka, *E. coromanda neophora*, Oberholser (*loc. cit.* p. 646). So far as I am able to judge from an adult male shot on 9th October, 1915, at Sungei Pelandok, Paku Seribas, S. W. Sarawak, the Bornean race, *H. c. minor* (Temm. and Schleg.) is quite separable from the typical form by its rich, darker colouration, the upper surface more strongly washed with lilac, and slightly smaller size. I have not as yet been able to examine good specimens from Singapore Island, which is stated by Oberholser to be inhabited by this form.

The species occurs also on Tioman but specimens from that island are too immature to identify subspecifically with any certainty.

37. Halcyon pileata (Bodd.)

Sharpe, tom. cit. p. 229; *Robinson and Kloss*, p. 31; *Robinson, Ibis*, 1915, p. 732; *Gyldenstolpe*, p. 116.

a–c. ♂, 2 ♀ Pulau Langkawi, 27th November, 1907. [F.M.S. Mus. 2897–9/07.]

d. ♂. Pulau Langkawi, 10th February, 1909, [F.M.S. Mus. 485/09.]

e. ♂. Telok Apau, Pulau Langkawi, 15th December, 1912.

f. ♂. Pulau Dayang Bunting, Langkawi. 8th December 1916. [No. 3603.]

g. ♀. Telok Wan, Terutau. 29th December, 1916. [No. 3787.]

"Iris dark, bill vermilion, darker at base, tarsi and toes vermilion, the latter darker."

There is extremely little *local* variation in this species throughout its range and a series from Borneo differs in no way from a large number from the Malay Peninsula. *Individual* variation is considerable, the rufous buff of the belly and flanks varying greatly in intensity. It is only very old birds indeed that entirely lose the black, crescentic edgings to the feathers of the sides of the breast indicative of immaturity.

A common rice-field bird wherever it occurs, though also found on the higher reaches of the rivers in deep jungle. Occasionally also on small islands in the Straits of Malacca during the winter months, evidently on migration.

38. Halcyon chloris (Bodd.).

Sharpe, tom. cit. p. 273. Pl. VII. fig. 3; *Robinson, Ibis* 1915, p. 731.

Halcyon armstrongi, Sharpe; *Robinson and Kloss*, p. 34; *Robinson, antea*, vol. V, p. 145; vol. VII. p. 71.

Halcyon chloris armstrongi, *Gyldenstolpe*, p. 117.

a–b. ♂,♀. Burau, N. W. Langkawi, 13–14th December, 1916. Nos. 3627. 3640.

c. ♂. Pasir Raja, Pulau Lontar, S. W. Siam. 12th January 1917. No. 3896.

"Iris black, upper mandible white, basal two-thirds, lower mandible pinkish white, feet grey."

There is little to add to what has already been written on the variability of the Indo-Malayan races of blue-and-white Kingfisher. The three specimens listed above differ considerably, one having the ear-coverts almost black, a greenish black band round the nape continuous with them, while in the other the ear-coverts are much more bluish green and the nuchal collar is very narrow and barely visible. The flanks are pure white with no trace of the buffy tint present in the bright blue birds characterised as *H. humii*, Sharpe. The mantle in all is greenish blue but the wings and wing coverts are pure blue. Wing 106, 102, 101 mm.

39. Pyrotrogon oreskios uniformis, *subsp. nov.*

Harpactes oreskios (Temm.); *Ogilvie Grant, Cat. Birds Brit. Mus.* XVII. p. 494 (1892).

Pyrotrogon orescius, *Robinson and Kloss*, p. 39; *Robinson, Ibis*, 1915, p. 736, *Gyldenstolpe*, p. 105.

a–b. 2 ♂. Burau, N.W. Langkawi. 13th December, 1916. Nos. 3628, 9.

c–i. 3 ♂, 1 ♀. Telok Wau, Terutau. 25-27th December. 1916. Nos. 3736, 3740, 3755. 6.

"Iris grey, bill, feet and orbits smalt, culmen black."

Dimensions of four males; TL. 274–299; W. 124–128; T. 150–174; B. 23.5–24; TS. 13.5–14 mm.

Fairly common on both the above islands.

A comparison of the above series and seventeen other specimens from various parts of the Malay Peninsula with nine specimens from Eastern Java (Idjen massif, nr. Banjoewangi) show that it is readily possible to distinguish the Malayan and Siamese from the typical Javan form, in that, both in males and females the rump and upper tail covert are concolorous with the back and not strongly tinged with zanthine orange. Dimensions are practically identical.

Types: Adult male, Lamra, Trang, Siamese Malaya, collected on January 10th, 1910.

Adult female: Gunong Jerai (Kedah Peak), Kedah, 2,800 ft. to 3,500 ft. collected on December 2nd, 1915.

Remarks: It is possible that *Oreskios gouldi* quoted by Ogilvie Grant, *(loc. cit.)* as of *Bp. Consp. Vol. Zyg.* p. 14, (1854) applies to this bird, but I have no access to the reference. The name, however, is of earlier date as it is quoted by Bonaparte in 1850 (*Consp. Av.* I. p. 151) as a synonym of *Trogon oreskios* and attributed to Swainson, though I cannot trace the quotation. I prefer, therefore, to regard it as a *nomen nudum*.

40. DICHOCEROS BICORNIS (Linn.)

Ogilvie Grant, Cat. Birds. Brit. Mus. XVII, p. 355 (1892); *Robinson and Kloss*, p. 35; *Robinson. Ibis*, 1915. p. 733; *Gyldenstolpe*, p. 113.

a. ♂. W. side Pulau Telibun, Trang, S.W. Siam, 2nd January, 1917. [No. 3911.]

Common on Terutau, Langkawi, Telibun and Lontar, but nearly always flying very high or feeding on very lofty trees and therefore difficult to procure.

41. RHYTIDOCEROS UNDULATUS (Shaw).

Ogilvie Grant, tom. cit. p. 382; *Robinson and Kloss*, p. 36; *Robinson, Ibis*, 1915, p. 733; *Gyldenstolpe*, p. 113.

a. ♂. Pasir Raja, Pulau Lontar, S.W. Siam, 12th January, 1917. [No. 3912.]

Also common on the islands.

42. ANTHRACOCEROS ALBIROSTRIS (Shaw and Nodder.)

Anthracoceros malabaricus, *Grant, tom. cit.* p. 365; *Robinson and Kloss*, p. 35.

Anthrococeros albirostris, *Robinson, Ibis*, 1915, p. 734; *Gyldenstolpe*, p. 112.

a. ♀. Burau, N.W. Langkawi. 13th December, 1916. No. 3631.

"Iris hazel, bill and casque ivory, black at tip and base, feet pale plumbeous with a greenish cast."

Common on Langkawi, Terutau and Pulau Butang in the Butang Archipelago, west of Langkawi.

The island specimens seem smaller than a male from Trang which approaches the larger Himalayan form *A affinis* (Blyth), wing about 305 against a maximum of about 260 in the island birds.

43. Eurystomus orientalis orientalis, Sharpe.

Eurystomus orientalis, *Sharpe, Cat. Birds Brit. Mus.* XVII, p. 33, pl. 11, fig. 1 (1892); *Robinson and Kloss, Ibis,* 1911, p. 32; *Stresemann, Nov. Zool.* XX. pp. 298–301 (1913); *Robinson, antea*, vol. V, p. 144 (1915).

a. ♀. Koh Muk (Pulau Muntia), Trang, S.W. Siam. 6th January, 1917. No. 3859.

b. ♂. Pasir Raja, P. Lontar, S.W. Siam. 10th January, 1917. No. 3871.

"Iris hazel, bill coral, black tip, feet coral."

Fairly common in all localities; also obtained at Pulau Terutau and P. Langkawi in former years from November to April.

I have again carefully gone through the considerable series of Rollers in the F.M.S. Museum and find that they have been collected in every month of the year, except June to September. There are, however, specimens dated July from Malacca in the British Museum, collected by Davison.

The series readily split on the general characters given for *E. orientalis* and *calonyx*, viz., the greater amount of blue on the outer tail feathers and inner secondaries in the latter form, but there is also another character and that even more marked, viz, the greater amount of blue on the primary coverts in *calonyx*, these feathers being never more than lightly edged with deep blue in *orientalis*.

There is no doubt that both races are migratory in the Malay Peninsula and that *E. orientalis orientalis* breeds in the country also, which *E. o. calonyx* almost certainly does not.

43. Merops viridis, Linn.

Merops sumatranus, Raffles, *Sharpe, tom. cit.* p. 61; *Robinson and Kloss*, p. 37; *Robinson, antea*, vol. V. pp. 92, 146.

Merops viridis, *Hartert, Nov. Zool.* xvii, p. 482 (1910).

a. ♀. imm. Pulau Langkawi, 8th February, 1909. F.M.S. Mus. No. 281/09.

In view of the fact that this species does not occur in Tenasserim or so far as is known further north in the Peninsula than Bandon, while there are no recent records from Siam proper, occurrences in Southern China and Lower Cochin China are open to doubt. The records of Oustalet and others are more likely to be referable to migratory specimens of the Philippine *M. bicolor*, Bodd.

It is unfortunate that we should have to transfer the name "*viridis*" from one well known species of Africa and India to this species but Hartert's statements cannot apparently be gainsaid. It is to be hoped, however, that some enthusiastic splitter will be found to discern differences between typical Javan birds and others from the Malay Peninsula, Borneo and Sumatra, as even the most austere lumper would view the race with an indulgent eye and we should be able to return to the more familiar name *sumatranus* for the local form, with a clear conscience, even if it was only used as a subspecific title.

44. Merops philippinus, Linn.

Sharpe, tom. cit. p. 71; *Robinson and Kloss*, p. 37; *Robinson, antea*, vol. v, pp. 146.

Merops superciliosus philippinus, *Gyldenstolpe*, p. 110.

a–b. 2 ♀. imm. Telok Wau, Terutau. 18-20th December, 1916. Nos. 3656, 3674.

"Iris carmine, bill black, feet greyish black."

Other specimens in the museum from Pulau Terutau are dated February and March. In the south of the Peninsula, probably from about the latitude of Terutau, this Bee-eater is almost certainly only a winter visitor, or at any rate is very rare at other seasons, all the specimens in the museums being dated from October to March. Further north it begins to be a resident form, as it was common on Koh Samui and Koh Pennan, islands in the Bandon Bight, about Lat 9°N., in May, 1913.

45. Melittophagus leschenaulti swinhoei, Hume.

Melittophagus swinhoii, *Sharpe, tom. cit.* p. 55; *Robinson and Kloss*, p. 36; *Robinson, antea*, vol. v, p. 92; *Robinson, Ibis*, 1915, p. 734.

Melittophagus leschenaulti swinhoei, Gyldenstolpe, p. 110.

a. ♂. Telok Wau, Terutau, 25th December, 1916. [No. 3739.]

"Iris carmine, bill and feet black."

Common also at Langkawi, whence specimens have been obtained in the months of February, April, November and December.

Immature birds have the chestnut bay of the forehead mingled with greenish, the throat paler and the chestnut colour of the lower throat preceding the black patch not nearly so marked.

This species has never been found further south in the Peninsula than Parit, central Perak, whence we have two specimens shot in September, 1911. It occurs neither in Borneo or Sumatra but reappears in a slightly altered form in Java and Bali as the typical *M. leschenaulti* (Vieill.)

46. Caprimulgus macrurus bimaculatus (Peale).

Caprimulgus bimaculatus, *Peale. U. S. Expl. Exped.* viii, p. 170 (1848).

Caprimulgus ambiguus, *Hartert, Ibis,* 1896, p. 373; *Robinson and Kloss,* p. 37; *Robinson, Ibis,* 1915, p. 733.

Caprimulgus macrurus bimaculatus, *Oberholser, Proc. U. S. Nat. Mus.* 48, p. 595 (1915). *Gyldenstolpe,* p. 109.

a. ♂. ad. Pulau Langkawi, 1st December, 1907. F.M.S. Mus. 2896/07.

b. ♂. vix ad. Pulau Langkawi, 3rd March, 1909. F.M.S. Mus. No. 276/09.

In the paper quoted above Mr. Oberholser has revived a name of Peale's for this common Malayan goatsucker, which had escaped Mr. Hartert's attention and has shown that in all probability the specimen came from the vicinity of Malacca and not from Singapore as stated.

The fairly large material in this museum bears out his contentions, in that a specimen from Pulau Besar, Malacca, agrees with other specimens from further north in the Peninsula and differs from three from Singapore Id. including an actual topotype of *C. m. anamesus,* Oberholser (loc. cit. p. 593), from Tanjong Katong, in being decidedly larger. The latter race is probably valid but larger series from Singapore and Sumatra require comparison with series from Borneo. Should they prove identical, as may not improbably be the case, they will have to bear the name *C. m. salvadorii,* Sharpe (Proc. Zool. Soc. London, 1875, p. 99, pl. 22, fig. 1). The large pale form, *C. m. albonotatus,* does not come down south into the Malay Peninsula or even into Southern Siam.

47. Caprimulgus indicus jotaka, Temm. & Schleg.

Caprimulgus jotaka, *Hartert, Cat. Birds Brit. Mus.* xvi, p. 552 (1892); *Robinson and Kloss,* p. 37.

Caprimulgus indicus jotaka, *Hartert, Vog. Palaarkt.* Heft. VII, p. 855 (1912).

a–b. ♂. vix. ad. ♀ ad. Telok Wau, Terutau. December 21st 1916. [Nos. 3704. 5.]

These specimens are rather small (male, wing, 196, female, 193) but the former is hardly adult as shown by the buffy borders to the white spots on the primaries. According to the limits given by Hartert they would fall to *C. indicus indicus* (Lath.), the Indian western form. In view of the dimensions of four birds from the adjacent island of Langkawi shot in the months December to March (203-211 mm) I do not however think this is really the case.

The species occurs in the south of the Malay Peninsula (but apparently only at considerable altitudes) and on islands of the Straits of Malacca but only during the months October to March.

The whole series agree well in dimensions with the specimen from Choungthanoung (between Mergui and Pakchan) Tenasserim, (wing, 7·9 in = 204 mm.) to which Hume (*Stray Feathers*, iii, p. 318 note, 1875) gave the name *Caprimulgus innominata*. As he has pointed out specimens from the Malay Peninsula and Tennasserim are certainly intermediate in size between specimens of *C. indicus indicus* (Lath.) and *C. indicus jotaka* (Temm. & Schleg.) in their breeding areas, and it would be interesting to ascertain if these intermediate-sized birds have themselves a distinct breeding area, in which case, *C. indicus innominata*, Hume would be a fairly well defined subspecies. In default of this information I prefer to leave the question open.

48. Collocalia francica germaini (Oust.).

Collocalia germaini, *Oustalet*, *Bull. Soc. Philomath. Paris* pp. 1–3 (1876); *Hartert*, Ibis, 1896, p. 376.

Collocalia francica merguiensis, *Hartert*, *Cat. Birds Brit. Mus.* xvi, p. 453 (1892) *Robinson*, *antea*, 7, p. 146 (1914).

Collocalia francica germaini, *Gyldenstolpe*, p. 106.

a–b. ♀. Pasir Raja, Pulau Lontar, S. W. Siam, 11th January, 1917. [Nos. 3880, 3885.]

"Iris dark hazel, bill black, feet purplish brown."

These two birds, wing 122 and 121, agree closely with the large series obtained by us on the islands of the Bandon Bight in 1913, and which were named *C. merguiensis*, Dr. Hartert's statement that this race was identical with *C. germaini*, Oustalet, having escaped our notice. The race is fairly distinct, being marked by having the pale rump band with clearly defined shaft stripes but is close to *C. f. inexpectata*, Hume, which is found on the Tioman group of islands and on the coast of Johore, but was originally described from the Andamans. This race however has the rump band very inconspicuous, often indeed hardly discernible, and may be the form that Oberholser has referred to *Collocalia fucifaga vestita* (Less.) (Proc. U. S. Nat. Mus. 42, p. 15 (1912)) allocating to it specimens from Sumatra, East Johore and Simalur.

Both this and *C. innominata*, which can scarcely be distinguished in life and on the wing, were very abundant in all the limestone islands along the coast, the caves in which they breed being annually leased out to Chinamen at considerable rentals.

49. Collocalia innominata, Hume.

Hartert, *tom. cit.* p. 503.

a–b. ♂. ♀. Pulau Belitung, S. W. Terutau, 22nd December, 1916. [Nos. 3701. 2.]

Nesting in very great numbers on this limestone island, which is riddled with caves and is the "Spire Island" of the British Admiralty Charts.

This species [with the exception of *C. gigas*, Hartert and Butler,* which is only known from two specimens, the type from the Semangko Pass and another from Java (wing 157 mm.)], is the largest of the local species. The two specimens listed above have wings of 129 and 131 mm. It is common on the mountains from Larut in Perak to Selangor and has also been obtained on the coast of Selangor at Tanjong Karang.

50. Cypselus subfurcatus, Blyth.

Micropus subfurcatus, *Hartert, Cat. Birds Brit. Mus.* xvi, p. 456 (1891).

Apus affinis subfurcatus, *Hartert, Vog. Pal. Faun.* ii, p. 843 (1912).

a–b. 2 Koh Muk (Pulau Muntia), Trang, S. W. Siam. 5th January, 1917. Nos. 3855, 6.

"Iris and bill black, feet dark purplish flesh, toes black."

This species was exceedingly common on the cliffs of Koh Muk, where it built its untidy nests made of feathers and grass stems in the cracks of overhanging rocks at varying heights above the sea while the *Collocalia* built far inside the caves in total darkness.

While dealing with this genus it may be mentioned that the male of *Cypselus pacificus* obtained on Kedah Peak in December, 1915 (antea vol. vi, p. 226) agrees in all its characters with the subspecies *C. pacificus cooki*, described by Major Harington† from Goteik, Northern Shan States, where it was found breeding.

Our bird has the wing 163 and outer tail feathers 83 against 170 and 75 in the type, the white rump band very narrow with black shaft stripes and the white of the throat much restricted with marked shaft stripes, the mantle deep glossy black. These characters however occur also, though to a lesser degree, in a bird from the Semangko Pass shot in February, 1908.

It appears to me not improbable that Harington has compared a very adult bird in fresh pelage (his specimen was breeding) with younger birds. The size is not materially more than that of Malayan specimens, which vary from 163–176, while Hartert (loc. cit) gives 176–184.5 for the wing of the species as a whole.

Specimens from Koh Pennan, shot in May, are much browner and duller.

51. Cacomantis sepulchralis sepulchralis (S. Müll.).

Cacomantis sepulchralis (S. Müll.); *Finsch, Notes Leyden Museum* XXII, p. 82 (1900).

Cacomantis merulinus (part.) *Shelley, tom. cit.* p. 268.

* *Bull. Brit. Orn. Club.* XI. p. 65 (1901).

† *Bull Brit. Orn. Club.* XXXI. p. 57 (1913).

Cacomantis sepulchralis sepulchralis, *Stresemann. Nov. Zool.* XIX, pp. 332–334 (1912).

a. ♂ ad. Koh Muk (Pulau Muntia) Trang, S. W. Siam. 4th January, 1917. No. 3838.

"Iris orange, orbits lemon, bill black at tip and on culmen, remainder yellowish brown, feet dull orange."

Total length 213; wing, 112; tail, 118; bill from gape, 24; tarsus, 16 mm. Stresemann (loc. cit.) in his careful review of this group does not recognize this species as occurring on the mainland of Asia. The present bird, however, agrees closely with a small series collected in Western Java, differing only in being of a somewhat clearer gray above, less glossed, with an oily green lustre, which is very apparent in some Javanese birds.

52. Surniculus lugubris dicruroides (Hodgs).

Surniculus lugubris (part), *Shelley, tom. cit.* p. 227. *Robinson and Kloss*, p. 39; *Robinson, Journ. Fed. Malay States Mus.* ii, p. 176 (1909).

Surniculus lugubris dicruroides (Hodgs). *Gyldenstolpe*, p. 102.

♂ ad. Pulau Langkawi, December, 1907. [F.M.S. Mus. 2928/07.]

a. ♀ ad. Pulau Langkawi, February, 1909. [F.M.S. Mus. 460/09.]

b. ♀ ad. Burau, N. W. Langkawi, 14th December, 1916. [No. 3644.]

♂ ad. Pulau Terutau, 1st December, 1907. [F.M.S. No. 2927/07.]

c–e. ♂ 2 ♀ ad. Telok Wau, Terutau, 20–26th December, 1916. [Nos. 3673, 3741–2.]

f–g. ♂ ♀ ad. Pulau Telibun, Trang, S. W. Siam. 2nd January, 1917. [Nos. 3818–20.]

h–i. 2 ♂ ad. Chong, Trang, S. W. Siam, 3–4th December, 1909. [F.M.S. Mus. Nos. 63, 122/10.]

j. ♂ ad. Padang Sireh, Perlis, Senggora border, 21st November, 1911.

k–m. 2 ♂ ♀ ad. Pasir Raja, Pulau Lontar, S. W. Siam, 11–12th January, 1917. [Nos. 3887, 3899, 3900.]

"Iris hazel, bill black, feet purplish slate."

Dimensions:—

Males. TL.—,246, 253, 247,—,—,—,—,256; W. 133, 132, 142, 135, 142, 136, 134, 136, 135; T. 136, 129, 137, 138, 129, 129, 135, 133, 138; B. 27, 28, 25,—,25, 26,—,25, 29; TS.—,18, 18, 18,—,—,—,—,17.

Females. TL.—,248,—,245, 258, 247; W. 128, 143, 132, 140, 133, 135; T. 114, 129, 128, 129, 131, 132; B. 24, 26, 27, 25, 5, 27, 27; TS.—,17,—,17, 5, 17, 17.

Stresemann (Nov. Zool. XX, p. 340) has separated the form from the south of the Peninsula, (type from Bentong, Pahang) as *Surniculus lugubris brachyurus* as having a wing averaging about 124 mm. with a tail always shorter than the wing. He includes in this race the birds from Borneo and Sumatra, confining the typical *S. lugubris* of Horsf. to Java, Bali and Ceylon, which is rather an anomalous distribution.

Our series from the lowlands of the south of the Peninsula is unfortunately somewhat deficient in adult birds; a male from Penang has the wing 128, tail 127, a male from Ulu Selama, wing 119, tail 116; a male from Tanjong Malim, 126, tail 123, a male from Kuala Tembeling, Pahang, close to the type locality, wing 119, and tail 114, and two males from Temengoh, North Perak, wing 117, 120, tail 118. A female from Pulau Jemor in the Straits of Malacca, near the coast of Sumatra, has the wing 135 and the tail 130, while two males from West Sumatra have the wing 126, tail 123 and a female, tail 123, wing 123. These specimens certainly bear out Stresemann's diagnosis.

Specimens from the mountains of the Peninsula where the species breeds are however emphatically not this race as two males from the Semangko Pass on the borders of Selangor and Pahang measure wings, 146, 138; tail, 138, 135, and must be referred to the Himalaic form as also one from Taiping shot in January, wing 143, tail 138 mm.

So far as the evidence goes it appears that two races are quite distinct viz. *Surniculus lugubris*, Horsf. from Java and Bali, which has possibly become very slightly modified in Sumatra, Borneo, and the South of the Malay Peninsula at low levels (*S. l. brachyurus*) and *S. lugubris dicruroides* from the Himalayas, through the Indo-Chinese Countries to the north of the Malay Peninsula and southwards along the main range at high elevations. Judging from analogy the Ceylon and Malabarese specimens will probably also prove separable. These conclusions are substantially those come to by Stresemann from the study of the very large material in the British and Tring Museums.

53. Centropus sinensis intermedius (Hume).

Centrococcyx intermedius, Hume: *Stray Feath* i. p. 454 (1873).

Centropus sinensis (Steph.); *Shelley tom. cit.* p. 343; *Robinson and Kloss*, p. 41.

Centropus sinensis intermedius. *Stresemann, Nov. Zool.* XX, p. 322 (1913); *Robinson, antea*, vol. v, pp. 93, 146; *Gyldenstolpe*, p. 103.

a. 1 ♂ Koh Muk (Pulau Muntia) Trang, S. W. Siam, 5th January, 1917. [No. 3847.]

b-c. ♂ ♀ Pasir Raja, Pulau Lontar, S. W. Siam, 12th January, 1917. [Nos. 3892, 3898.]

"Iris carmine, bill and feet black."

Male. TL.—, 481; W. 201, 203, T. 248, 240; B. 45, 48; TS. 51, 52.

Female. TL. 524; W. 205; T. 284; B. 45; TS. 50.

These specimens differ from the southern *C. s. bubutus*, Horsf. in the characters previously assigned viz. slightly shorter wing, markedly shorter but much broader tail, and the purer, less ochraceous chestnut tint of the wings and scapulars. The two races of course grade into each other but a bird from Lenggong in Upper Perak decidedly belongs to the southern form.

54. Rhopodytes sumatranus (Raffles).

Shelley, tom. cit. p. 391.

a-b. ♂ ♀ Lem Pia, N. Side Telibun Straits, Trang, S. W. Siam, January 2nd, 1917. [Nos. 3826, 7.]

"Iris pearl, orbits orange red, fading posteriorly into yellow bill sea green, feet, greenish slate."

Climbing about in the characteristic awkward manner in a very thorny tree in an open plain.

The species is here approaching the northern limit of its range. The Museum also possesses a male from Krong mon, interior of Trang, shot on 17th February, 1910 which has been omitted in the list given by Mr. Kloss and myself (Ibis, 1911, p.)

55. Coccystes coromandus (Linn.).

Shelley, tom. cit. p. 214; *Robinson and Kloss*, p. 39; *Gyldenstolpe*, p. 101.

a. ♀ ad. Burau, N. W. Langkawi. 12th December 1916. No. 3621.

b-d. ♂ ad. Telok Wau, Terutau. 18th-28th December 1916. Nos. 3660, 3760, 3781.

e. ♀ ad. Pulau Telibun, Trang. S. W. Siam. 1st January 1917. No. 3805.

"Iris hazel, bill black, feet slate."

Male. 383; W. 158; T. 230; B. 35; TS. 25.

Female, Tl 374, 388; W. 158, 162; T. 227, 234; B. 33, 34. TS. 27, 24.

Our series in the Museum shows no confirmation of statements by Shelley and Legge that there is a sexual difference in size in this species but we are very deficient in females, nor apparently is there any difference in the colour of the sexes when specimens in a similar condition of plumage are

compared. Worn specimens show a much more oily green tint on the mantle and inner secondaries.

Common along the coasts of the NW. Malay Peninsula and on the islands of the Straits of Malacca during the winter months, but rare even on migration in the south of the peninsula. Apparently not resident.

56.* Cuculus micropterus, Gould.

Shelley, op. cit. p. 241; *Robinson and Kloss*, p. 40; *Gyldenstolpe, Journ. Nat. Hist. Soc. Siam*, i, p. 232 (1915).

a. ♂ ad. Burau, N. W. Langkawi. 15th December 1916. No. 3646.

"Is, Cere olive green, bill greenish horn, the culmen black, gape yellow, feet chrome yellow."

TL. 305; W, 195, T, 153, B, 30. 5. TS, 18.

In the Malay Peninsula this species has been found breeding in July but as a resident it is scarce. It is, however, common on migration during the winter months.

57. Hierococcyx sparverioides (Vig.).

Shelley tom. cit. p. 232; *Robinson and Kloss*, p. 40; *Gyldenstolpe*, p. 102.

a. ♀ imm. Pulau Dayang Bunting, Langkawi. 9th December 1916, No. 3616.

b. ♀ imm. Pasir Raja, Pulau Lontar, S. W. Siam, 10th January, 1917.

"Iris light hazel, orbital ring and feet chrome, upper mandible black, lower and gape olive green."

TL. 380, 403; W, 233, 232; T, 220, 229; B, 34, 34; TS, 25, 28.

A fine adult female from Ko Khau, Trang, has the wing (measured dry) 232 and an immature male from the same locality 237. Shelley *loc. cit.* gives the wing of an adult as 8¼ in. (210) so that the specimen he measured, if correctly recorded, must have been exceptionally small. Gyldenstolpe's adult male from Koon Tan, North Siam, measured 237 mm.

The species is evidently fairly common in the northern third of the Peninsula though probably only in the winter months but is extremely rare south of the latitude of Penang. As is the case with so many migratory species birds that have not yet attained the fully adult plumage appears to be in the great majority.

58. Hierococcyx nisicolor (Hodgs.).

Robinson and Kloss, p. 40; *Robinson, antea*, vol. v, p. 93.

Hierococcyx fugax (part.) *Shelley, tom. cit.* p. 2361.

a-c. 1 ♀ vix ad. 2 ♂ imm. Telok Wau, Terutau, 18th-24th December 1916. [Nos. 3659, 3728, 3729].

d. 1 ♂ ad. Sungei Udang, Terutau, 8th March. 1909.

TL. 310, 290, 273; W, 176, 171, 172; T, 158, 160, 145; B, 34, 28, 5, 30; TS, 18, 19, 19.

"Iris orange, orbital ring and feet bright chrome, bill yellowish green, tip and culmen green."

Fairly abundant, especially in the winter months, throughout the Peninsula but much commoner in the northern half, where its numbers are evidently largely augmented by migrants. Some birds, however, probably reside throughout the year as the museum possesses adults and extremely young birds shot at Temengoh, Northern Perak, on July 15th.

The most southerly specimen I have been able to examine is an adult male from Gunong Tampin, Negri Sembilan, and this is undoubtedly the present form. Specimens from Southern Johore and from Singapore will however not improbably prove to be referable to the original *Hierococcyx fugax* (Horsf.) described from Java, of which the present form is only the continental race.

The species has not as yet been recorded from any part of Siam except the Peninsula.

59. Eudynamis orientalis malayana, Cab. and Heine.

Eudynamis orientalis, *Robinson and Kloss*, p. 41; *Robinson antea*, vol. v, p. 146.

Eudynamis honorata (part.) *Shelley, tom. cit.* p. 316; *Robinson Ibis*, 1915, p. 737.

Eudynamis malayana, *Cab. and Heine. Mus. Hein.* iv, p. 52 (1862).

Eudynamis orientalis malayana, *Hartert, Nov. Zool.* X. p. 236 (1903); *Gyldenstolpe*, p. 103.

a, b. 2 ♂ vix ad. Koh Kadan (Pulau Papan), Trang, S. W. Siam. 7th-8th January, 1917. [Nos. 3865-6].

"Iris red, bill greenish slate, legs slate."

TL.—,415; W, 198, 201; T, 211, 214; B, 38, 40; TS, 34, 34.

Fairly common everywhere.

The races of the Koel have been much discussed from the time of Walden (*Ibis* 1869, p. 239 et seq.), but no great degree of unanimity seems to have been attained. In the Malay Peninsula and possibly in Siam the question is further complicated by the fact that individuals of two different races appear to winter in the country while in addition there are possibly birds who are resident throughout the year, though we have no direct evidence on this point as the species is extremely rare anywhere on the mainland except in the north of the Peninsula.

Most authorities are agreed that in the Indian and Indo-Malayan regions two races occur, viz., one with a wing less than 8 in. (200) mm. and a less robust bill, the male with a greenish gloss and the female with clear white streaks on the head and white bars on the tail.

This race is *Eudynamis orientalis honorata* (Linn.)

The second race is larger, wing up to 8.6 in. (215 mm.) or more, with a more robust bill, with a cast of violaceous in the plumage of the male and the pale parts of the female buffy or rufescent buff.

This race is *Eudynamis orientalis malayana*, Cab. and Heine.

Judged by these standards specimens from Trang (Mainland and Islands), December and January; Koh Pennan and Koh Samui, SW. Siam, May; Pulau Langkawi, February; Pulau Paya near Pulau Langkawi, December; Pulau Jemor, Aroa Ids. November; Pulau Jarak, Straits of Malacca, March; and Pulau Lalang and Pulau Rumpia, Sembilan Ids., November and January; belong to this form, *Eudynamis orientalis malayana, Cab. and Heine* while others from Pulau Langkawi, February; Pulau Paya near Pulau Langkawi, April; Pulau Bidan, near Penang, April; Pulau Jarak, Straits of Malacca, March; Pulau Rumpia, Sembilan Ids. January and March, and Great Redang Id. off the coast of Trengganu, August, belong to *Eudynamis orientalis honorata* (Linn.).

The evidence, such as it is, points to the possibility that there is no resident Koel in the Malay Peninsula, south of Trang, and that the birds that are so numerous on the small islands off the coast are seasonal visitors, the differences noted between them being due to the fact that they have come from widely separated localities, thus accounting for the fact that two apparently different races can be shot on the same small island on the same day. The races of *Eurystomus orientalis* and *Accipiter gularis* afford parallel instances.

60. Chrysocolaptes guttacristatus indo-malayicus, Hesse.

Chrysocolaptes guttacristatus (Tick.) *Hargitt, tom. cit.* p. 448 (*part.*) *Robinson and Kloss*, p. 47; *Robinson, antea*, vol. V, p. 147.

Chrysocolaptes guttacristatus indo-malayicus, *Hesse, Ornith. Monatsb.* p. 182 (1911). *Gyldenstolpe, Kongl. Svenska. Vetensk. Akad. Handl. Band* 50 No. 8, p. 49 (1913). *Robinson, Ibis*, 1915, p. 739;

a. ♂ Pulau Langkawi, 11th February, 1909. [F.M.S. Mus. 310/09.]

b. ♀ Kubong Badak, Pulau Langkawi. 18th March, 1909. [F.M.S. No. 315/09.]

c. ♂ Sungei Udang, Pulau Terutau. 8th March 1909. [F.M.S. No. 313/09.]

d–g. 3 ♂, 1 ♀ Telok Wau, Pulau Terutau. 18–24th December 1916. [Nos. 3658, 3678, 3723, 3730.]

h–i. ♂ ♀ Chong, Trang, S. W. Siam 11–15th December 1909. [F.M.S. Mus. Nos. 395, 396/10.]

j. ♂ vix ad. Koh Samui, Bandon Bight, S. E. Siam. 8th May 1916.

"Iris orange, bill dark greenish slate, feet olive green."

The detailed measurements of two males from Terutau, taken in the flesh are; TL. 287, 290; W, 164, 157; T. 97, 95; B, 50, 54; TS. 31, 28.

The wing and bill (from gape) of the Langkawi specimens taken on the skins are male, W, 156, B. 55; Female, W, 151, B. 49; of three other specimens from Terutau:—Males, W. 159, 154, B. 52, 51. Female, 153, B. 46. Of the Trang specimens, Male, W. 157, B. 49; Female, W. 150, B. 51. Of the bird from Koh Samui, W. 160, B. 52. The dimensions of two males from Tonka (the type locality of the subspecies as given by Hume (*Stray Feath.* viii, p. 154) as 6·15 and 6·3 in. on the wing. viz. 156 and 160, which agrees well with the above series.

In my paper on the collection made by Mr. Kloss in S. E. Siam I unfortunately attributed Tickell's type of *Picus guttacristatus* (Journ. Asiat. Soc. Bengal) iii, p. 578 (1833) to Northern Tenasserim, where the greater part of his collections were made, whereas it was really secured in the jungles of Eastern Bengal. As Hume, Oates and Blanford have pointed out the Southern Indian bird, *C. delessertii*, Blyth, that from eastern Bengal and the low country adjacent, *C. guttacristatus* (Tick.) and the birds from the northern Malay Peninsula approximate in size, though it would appear that the Malay birds on the whole averages smaller, the wing never exceeding 164 mm (6.45 in.) while it is possibly brighter in general tone. *Chrysocolaptes sultaneus* (Hodgs.) from the Himalayas is a very large bird indeed and can fairly claim subspecific rank on these grounds alone though there are no tangible differences in colouration.

In the Malay Peninsula the bird is common in the northern third but is unknown from any locality between Penang and Southern Johore where a small form occurs, W. male, 148, 143; B. 46, 47, which will receive a name in due course. This form also occurs abundantly on the islands of the Rhio–Johore archipelago south of Singapore.

It thus appears that in order of size we have the following forms.

C. guttacristatus sultaneus, Himalayas. Wing averaging 177 mm.

C. guttacristatus guttacristatus. Eastern Bengal, Burma, etc. Wing 161 or perhaps slightly more.

C. guttacristatus indomalayicus, Southern Siam and North Malay Peninsula, Wing 156 mm. (mean of twelve.)

C. guttacristatus delesserti, Southern India. Wing averaging 152.

C. guttacristatus (*unnamed*). Extreme south Malay Peninsula, Wing, 145 mm.

The bills grade in even greater ratio.

The maximum range of wing of the species as a whole is from about 190 to 143 or a subspecies to every nine mm. as all authorities seem agreed that no constant differences in colouration can be detected except possibly as noted above, a slightly more intense tint in the Indo-Chinese and Indo-Malayan specimens.

61. Alophonerpes pulverulentus (subsp.)?

Hemilophus pulverulentus (Temm.); *Hargitt, tom. cit.* p. 494.

Alophonerpes pulverulentus, *Robinson and Kloss*, p. 47: *Robinson, antea*, vol. V, p. 95.

Mülleripicus pulverulentus harterti, *Hesse Ornith. Monatsh.* xix, p. 182 (1912), *Gyldenstolpe*, p. 96.

a–b. ♂ ♀ Pasir Raja, Pulau Lontar, S. W. Siam. 10th January, 1917. [Nos. 3872, 3.]

c. ♂ Telok Wau, Terutau, 27th December, 1916. [No. 3761.]

d. ♀ Pulau Terutau, 3rd December 1907. [F.M.S. Mus. 2907/97.]

e. ♀ Pulau Langkawi, 9th February 1909. [F.M.S. Mus. 309/09.]

f–g. ♂ ♂ Ulu Malacca, Pulau Langkawi 29th December 1912.

I have no access to Hesse's description of this form described from Burmah but which is apparently merely a larger form of the Malayan race, nor have I specimens from Java whence came Temminck's type so these specimens cannot at present be identified subspecifically with any certainty.

The wings of the males are 222, 228, 228 and of the four females, 221, 227, 227, 235, while Glydenstolpe's two males from North Siam which would certainly belong to Hesse's race are given as 242. 235. A female from Kuala Lipis, Pahang is 229 mm.

Compared with a female from Anyut Paku, Seribas, S. W. Sarawak, whose wing measures 230 mm. all the Malayan birds are much greyer and less slaty black, especially on the top of the head, the mantle and undersurface, but this difference may be merely individual.

"Iris dark hazel, orbits slate, tall greenish horn, culmen at base darker feet slate."

62. GECINUS VIRIDANUS, Blyth.

Hargitt, tom. cit. p. 47; *Robinson and Kloss*, p. 45; *Robinson, antea*, vol. V, p. 95.

Gecinus weberi, *Muller, Orn. Ins. Salanga*, p. 69 (1882).

Picus viridianus (sic) *Gyldenstolpe*, p. 89.

a–e. 1 ♂, 4 ♀. W. side Telibun, Trang, S.W. Siam. 2-3rd January, 1917. [Nos. 3800, 3813–4, 3821–2.]

e–n. 6 ♂, 3 ♀. Koh Muk (Pulau Muntia) Trang, S.W. Siam. 5-6th January, 1917. [Nos. 3839–40, 3848–51, 3863–5.]

n–q. 2 ♂, 1 ♀. Pasir Raja, Pulau Lontar, S.W. Siam. 10-11th January, 1917. [3876–7, 3888.]

"Iris chocolate, upper mandible black, lower yellow, slate at tip, feet olive, orbits slate."

Both bronzy green and olive green types are represented in the series from each island, all the specimens being quite adult.

Two males from Koh Muk present a curious abnormality, having the feathers of the flanks and abdomen largely creamy white, evidently due to partial albinism, which is by no means uncommon among species both of birds and mammals inhabiting small islands in the Malayan area, and presumably to be explained by deterioration of stock due to excessive inbreeding.

In the north of the Peninsula, this species takes the place of *G. vittatus*, which has not been met with north of Langkawi, while the southernmost specimen of *G. viridanus* in our possession was obtained at Pelarit, Perlis. The relation between the two forms is however evidently not subspecific as the large series in the Museums show no evidence of intergradation.

63. GECINUS VITTATUS EISENHOFENI (Gyldenstolpe).

Gecinus vittatus (*nec Vieill.*). *Robinson and Kloss*, p. 45; *Robinson Ibis* 1915, p. 738.

Picus vittatus eisenhoferi, *Gyldenstolpe, Ornith. Monatsb.* xix, p. 28 (1916); *id. op. cit.* p. 88 (1916).

a. ♀. Pulau Dayang Bunting Langkawi, 10th December, 1916. [No. 3619.]

Gyldenstolpe (*loc. cit.*) is probably not incorrect in separating the northern race of this woodpecker from that inhabiting the Southern Malay Peninsula, Java and Sumatra, though the material at his disposal appears to have consisted of a single female with a wing of 142 and a tail of 128.

The present bird has the wing 137 and the tail, which is not completely grown, about 114. Two other females from the

same locality measure W. 137, 135; tail, 125, 115 and two males W. 138, 135, T. 122, 122.

Mr. Kloss' two specimens from S.E. Siam listed by me had the wing about 139. All these birds may be considered as belonging to the above cited northern race, which differs merely in size from birds from the south of the Malay Peninsula which for the present may be taken as representing true *C. vittatus* (typical locality Java) the colour distinctions noted by Gyldenstolpe in his single specimen occurring in both forms indifferently. The dimensions of the southern birds in the F.M.S. Museums from localities ranging from Kuala Selangor to the extreme south of the Peninsula are wing, 127–132 or a mean of 128.2 for eight specimens while the wing of the northern form as indicated by the specimens quoted above ranges from 135–142 with a mean also for eight specimens of 138·2 mm.

64. Calorhamphus hayi (J. E. Gray).

Shelley, tom. cit. p. 50; *Robinson and Kloss*, p. 43.

a–c. 2 ♂. 1 ♀. imm. Pasir Raja, Pulau Lontar, S.W. Siam. 9th January, 1917. [Nos. 3867–9.]

It is very unusual to find barbets frequenting even the larger islands near the coast of the Malay Peninsula and the occurrence of this species at Pulau Lontar was therefore a little surprising.

It seems hardly correct to rank this form from Sumatra and the Malay Peninsula as merely a subspecies of *C. fuliginosus* (Temm.) from Borneo, which differs so markedly in its deep brick red throat, chin and upper breast, as some authors have done. Malayan birds precisely agree with specimens from Korinchi, West Sumatra, and it is difficult to credit Buttikofer (*Notes Leyden Mus.* ix, p. 17 (1887) who seems to consider that the two species are but plumage stages of one and the same bird. Of the very large series of *C. hayi* from the Malay Peninsula and Sumatra that have passed through my hands I have never seen one that could for a moment be confounded with *C. fuliginosus*, while the same is true of the series of *C. fuliginosus* before me, when compared with *C. hayi*.

Immature birds have the throat and lower surface washed with pale sulphur yellow and the tips of the median wing coverts rufous buff. The bills are black in the males and brownish horn in the females.

65. Xantholaema haemacephala (P. L. S. Mull.).

Xantholaema haematocephala, *Shelley, tom. cit.* p. 89; *Robinson and Kloss*, p. 44; *Robinson, antea*, p. 95 (1913).

a–c. 2 ♂ ♀. Pasir Raja, Pulau Lontar, S.W. Siam, 11—12th January, 1917. [No. 3890, 3906, 7].

"Iris hazel, bill black, feet and orbits coral."

These specimens have the wing, 84.5 mm. and I do not see how they are to be separated from typical specimens from the Philippines, with which they agree in size. In any event however there is a name available for the continental bird, viz. *Bucco indicus*, Lath. Ind. Orn. i., p. 205 (1790) which must be applied to Malayan birds, although Parrot has separated the Sumatran bird on the strength of a slightly smaller size which is not altogether borne out by our large series from West Sumatra and on certain differences in colour, some of which we can confirm, the most noticeable being the absence of the conspicuous orange yellow collar beneath the scarlet pectoral patch, which is very noticeable in all the Malayan but barely indicated in any Sumatran specimens, which in addition have the green centres to the feathers of the abdomen and flanks more restricted and the margins of a creamy rather than a sulphury yellow. Parrot's name for this form *Megalaema haemacephala delica*, (*Abhandl. der Konigl. Bayer. Akad. der. Wissensch.* (II) xxiv. Bd. 1, p. 169 (1907) is however antedated by *Bucco rafflesius* Boie, Brief. Ost. Ind. No. 15 (1832), of which our Korinchi and Padang coast birds may be regarded as topotypes.

65. Hirundo badia, Cass.

Sharpe, tom. cit. p. 166; *Robinson and Kloss*, p. 50; *Robinson, antea*, vol. V, p. 98.

a. Telok Wau, Terutau, 23rd December, 1916. No. 3721.

"Iris and bill dark, feet dark maroon brown."

Very common indeed both on Langkawi and Terutau and probably all over the Peninsula where there are precipitous limestone hills. Resident throughout the year and not known outside the limits of the Peninsula. A closely allied, but paler and considerably smaller form, *H. hyperythra*, Layard, is resident in Ceylon.

66. Hirundo javanica, Sparrm.

Sharpe, Cat. Birds Brit. Mus. p. 142 (1885); *Robinson and Kloss*, p. 50.

a. Koh Muk (Pulau Muntia) Trang, S.W. Siam, 5th January, 1917. No. 3854.

"Iris dark, bill and feet black."

Found breeding on the cliffs of Koh Muk together with *Cypselus subfurcatus* and *Collocalia sp.* Also common on Pulau Terutau, P. Langkawi and P. Tengah between Langkawi and P. Langkawi.

Common and resident all along the coasts of the Malay Peninsula, according to Hume and Davison rare in Tenasserim but very common in Southern Malaya. Curiously enough not hitherto recorded from Siam proper, though it is mentioned in a List of the Birds of Lower Cochin China by Tirant. Occurs also in the Philippines.

67. Pitta megarhyncha, Schleg.

Sclater, tom. cit. p. 421; *Robinson and Kloss*, p. 48; *Moulton, Journ. Straits Branch. Roy. Asiat Soc.* No. 67, p. 157, No. 311 (1914).

Pitta brachyura megarhyncha, *Parrot, Abh. Konigl. Bayern. Akad. der Wiss.* II. Kl. XXIV, Band. 1, p. 225 (1907).

a. ♂. Kuah, Pulau Langkawi, 27th April, 1915.

b. ♂. Pulau Terutau, 3rd March, 1909.

Though Sclater in the Catalogue and Sharpe in the Hand-list (III, p. 180, 1901) record this species as coming only from Burma, Tenasserim and the Malay Peninsula, the types came from Banka, while Parrot records it, though with some doubt as to identification, from Sumatra, where, however, one would expect to find it in the low lying south eastern districts. Moulton on the strength of a specimen obtained in exchange from the Raffles Museum, Singapore, records it from Borneo, but the authenticity of the label needs confirmation.

The species is, as has been pointed out by many authors, totally distinct from, and not a form of, *P. cyanoptera*, which is often found with it. Besides the striking difference in the size of the bill the present species lacks the black chin-spot and the mesial dark line on the crown which is much duller in colour than in *P. cyanoptera*. The colours beneath are less intense and the white speculum on the wing more extensive. Both Mr. Kloss and myself have found it only in the vicinity of, or actually in, mangrove forest, while its ally is much more widely spread.

68. Pitta cyanoptera, Temm.

Sclater, Cat. Birds Brit. Mus. xiv. p. 416 (1888); *Robinson and Kloss*, p. 48; *Robinson, Journ. Fed. Malay States Mus.* V, pp. 97, 147 (1914); *Gyldenstolpe* p. 84.

a. ♀. Pulau Dayang Bunting, Langkawi, 9th December, 1916. No. 3614.

b. ♂. Telok Wau, Terutau, 27th December, 1916. No. 3759.

"Iris hazel, bill black, feet pinkish flesh."

Common throughout the Peninsula and Siam at one time or other of the year. Often in very large numbers on very small islands during the winter months.

69. Pitta culcullata, Hartl.

Sclater, tom. cit. p. 448; *Robinson and Kloss*, p. 49; *Robinson, antea*, vol. v, p. 97 (1914).

A single somewhat immature female was shot on Pulau Paya, between Pulau Langkawi and the Kedah river, on April 28th, 1915. It is not rare in the north of the Peninsula generally but does not seem to be recorded from Siam proper.

70. PERICROCOTUS CINEREUS, Lafr.

Sharpe, tom. cit. p. 83; *Robinson and Kloss*, p. 55; *Gyldenstolpe*, p. 74; *Hartert Vog. Palaarkt. Faun.* I. p. 466 (1907).

a–b. 2 ♀. Kuah, Pulau Langkawi, 29th November, 1st December, 1907.

Common all over the Peninsula during the winter months but commoner in the north.

71. HEMICHELIDON FERRUGINEA, Hodgs.

Sharpe, Cat. Birds Brit. Mus. iv. p. 132 (1879); *Robinson, Journ. Fed. Malay States Mus.* ii, p. 16 (1906).

Hemichelidon cinereiceps, *Sharpe, Mus.* 1887, p. 441.

Muscicapa ferruginea, *Hartert Vog. Palaarkt. Faun.* i, p. 479 (1909).

a. ♂. Pulau Adang, Butang Archipelago, 20th April, 1911.

b–d. 3 ♀. Pulau Paya, nr. Kuala Kedah, 24–26th April, 1916.

This specimen is common in the high mountains of the Malay Peninsula, all our specimens being dated October to March, but the above specimens, together with one from Pulau Jemor, Aroa Islands, shot in November 1906 are the only ones recorded from low elevations. It is evident, therefore that the species is migrant and not a permanent resident, the above specimens being on passage.

72. ALSEONAX LATIROSTRIS (Raffles).

Sharpe, tom. cit. p. 453; *Robinson and Kloss*, p. 51; *Robinson, Ibis*, 1915, p. 742; *Gyldenstolpe*, p. 74.

a. ♀. Pulau Dayang Bunting, Langkawi, 9th December, 1916. [No. 3606.]

b. ♂. Telok Wau, Terutau, 19th December, 1916. [No. 3668.]

"Iris black, bill black, the base yellowish, tarsi brownish black."

Common throughout the Peninsula during the winter months.

I have grave doubts as to the validity of *Alseonax siamensis, Gyldenst. Ornith. Monatsb.* xix, p. 27 (1916); *loc. cit.* p. 74, founded on two specimens from Ban Hue Pong, Northern Siam. The descriptions read like that of a freshly moulted specimen of the above species but without actual examination of types or topotypical specimens it is impossible to be certain.

73. POLIOMYIAS MUGIMAKI (Temm.).

Poliomyias luteola, *Sharpe, tom. cit.* p. 201; *Robinson and Kloss*, p. 52.

Muscicapa mugimaki, *Hartert, Vög. Pal. Faun.* i, p. 492 (1910).

a. ♂ imm. Burau, N. W. Langkawi, 14th December, 1916. [No. 3636.]

b. ♂ imm. Telok Wau, Terntau, 28th December, 1916. [No. 3785.]

"Iris dark, bill horn, pinkish at base, feet dark brown."

Common in the Peninsula during the months October to April, immature birds in the dull pelage being in the great majority. We have numerous specimens from Terutau and also an immature male shot on Pulau Butang, Butang group, on April 21st, 1911.

74. Muscitrea grisola grisola (Blyth).

Pachycepala grisola, *Gadow, Cat. Birds Brit. Mus.* viii, p. 220 (1883).

Muscitrea grisola, *Robinson and Kloss*, p. 54; *Robinson, antea*, vol. V, p. 148; *Robinson, Ibis.* 1915, p. 743: *Gyldenstolpe*, p. 78.

Pachycephala grisola grisola, *Stresemann, Nov. Zool.* XX, p. 355 (1913).

a. ♀. Kuala Kubong Badak, Langkawi, 19th March, 1909.

b. ♀. Pulau Langkawi, 16th February, 1909.

c–d. 2♀. Pulau Butang, Butang Archipelago, 20th April, 1911.

e. ♀. Pulau Nipis, Butang Archipelago, 22nd April, 1911.

f. ♂. Pulau Tengah, Butang Archipelago, 23rd April 1911.

All these birds are fully adult, those from the Butang Ids. being in breeding condition. Immature birds shot on Koh Samui, Bandon Bight in May and Pulau Ketam, coast of Selangor, in July, have the outer webs of the inner secondaries rufous brown and the wing coverts tipped and edged with the same colour.

Very common on most small islands near the Malay Peninsula where there is mangrove forest and also along the coast of the mainland in similar situations, but so far as my experience goes never found in dry forest.

There has been much discussion as to the systematic position of this bird. It is certainly not a typical *Pachycephala* but would appear to be best placed in a genus of its own, near to *Niltava* and *Rhinomyias*. If only on zoogeographical grounds, it must be removed from *Pachycephala*.

75. Hypothymis azurea prophata, Oberholser.

Hypothymis azurea, Sharpe, tom. cit. p. 274; *Robinson and Kloss*, p. 53; *Robinson, antea* vol. V, pp. 99, 148.

Hypothymis azurea prophata, *Oberholser, Proc. U. S. Nat. Mus.* 39, p. 507 (1911); *Gyldenstolpe*, p. 79.

a–b. ♂ ♀. Burau, NW. Langkawi, 14 December, 1916. [Nos. 3632, 3642.]

c–j. 4♂, 4♀. Telok Wau, Terutau, 18-28th December, 1916. [Nos. 3652-3, 3694, 3709, 3938, 3749, 3770, 3786.]

k–l. ♂ ♀. W. side Pulau Telibun, Trang, SW. Siam. 2-3rd January, 1917. [Nos. 3809, 3820.]

"Iris dark hazel, bill and orbits smalt, feet blue grey."

Males range from 72 to 76 mm. in wing measurement, and are very constant in colouration over the whole length of the Malay Peninsula when specimens of a similar age and plumage are compared.

Cyornis sumatrensis (Sharpe).

Siphia sumatrensis, *Sharpe Tom. cit.* p. 451.

Cyornis sumatrensis, *Hartert, Nov. Zool.* ix, p. 550 (1902); *Robinson and Kloss*, p. 51; *Robinson, antea*, vol. v, p. 147 (1915); *Gyldenstolpe*, p. 76.

a–e. 4♂, ♀. Pulau Dayang Bunting, Langkawi, 8–9th December, 1916. Nos. 3607, 3609, 3611-13.

f. ♂. Burau, NW. Langkawi, 13th December, 1916. No. 3633.

g–j. 2♂, 2♀. Telok Wau, Terutau, 18-28th December, 1916. Nos. 3654, 3699, 3783–4.

"Iris and bill black, feet livid purplish flesh."

These specimens, with large series obtained from various other localities in the peninsula are very consistent *inter se*, and I have nothing to add to the brief description already given by myself and Mr. Kloss (*loc. cit.*). The wing varies from 70-73 mm. In all, the belly, under tail coverts and under wing coverts are pure unsullied white, therein differing from *C. dialilaema*, Salvad., which has these parts sullied buff, a larger patch of blue on the sides of the breast, a deeper blue last and is also possibly slightly smaller. The females also are quite different.

76. Terpsiphone paradisi affinis (Blyth).

Terpsiphone affinis, *Sharpe, tom. cit.* p. 274; *Robinson and Kloss*, p. 53; *Robinson, antea*, vol. v. pp. 99, 148; *Robinson, Ibis*, 1915, p. 745; *Gyldenstolpe*, p. 81.

a. ♀. imm. W. side Pulau Telibun, Trang, SW. Siam. 2nd January, 1917. [No. 3817.]

b. ♀. imm. Pasir Raja, Pulau Lontar, SW. Siam. 10th January, 1917. [No. 3881.]

"Iris dark hazel, bill, feet and orbits Payne's grey.

These specimens, are apparently birds of the year with the mantle and tail very pale cinnamon rufous but with a rather large bill, so that they are probably not the far Eastern form, *T. p. incii* (Gould) which winters in the Malay peninsula. Wing 83, 84 mm.

In the white plumage *T. p. incii* and *T. p. affinis* are with difficulty separated by the greater amount of black in the edgings of the tail feathers and wing coverts and by difference in size. Birds in the second year plumage are however easily distinguished by the rich maroon mantle and darker under-surface (especially throat) of *T. p. incii*.

77. Cyanoptila cyanomelana (Temm.).

Xanthopygia cyanomelæna, *Sharpe, tom. cit.* p. 251.

Cyanoptila bella, *Stejneger, Proc. U.S. Nat. Mus.* xv, p. 328 (1892); *Robinson antea*, vol. II, p. 189 (1909).

Cyanoptila cyanomelæna, *Robinson and Kloss*, p. 53.

Muscicapa cyanomelana, *Hartert, Vog. Palaarkt. Faun.* 1, p. 492 (1909).

a. ♂. ad. Sungei Udang, Terutau. 19th March 1909. F.M.S. Mus. No. 372/09.

No further specimens of this beautiful Flycatcher have been obtained in the Malay Peninsula since the above bird was secured. We have it, however, both from Borneo (Ulu Paku, Seribas, November, and from Korinchi, Sumatra, March).

78. Aegithina viridissima (Bp.).

Sharpe, Cat. Birds Brit. Mus. vi, p. 55 (1881); *Robinson and Kloss*, p. 55.

a–c. 3♂. Felok Wau, Terutau. 18–26th December 1916. [Nos. 3657, 3752, 3681]

"Iris dark hazel, bill plumbeous, upper mandible black, feet slaty green."

By no means a common bird in the Malay Peninsula, where it keeps much more to deep jungle than its congener, *Ae. tiphia*. This species is here approaching its northern limit, not having been obtained beyond Trang.

79. Chloropsis viridis zosterops, Vig.

Chloropsis zosterops, *Sharpe, tom. cit.* p. 24; *Robinson and Kloss*, p. 55.

a. ♂. W. side Pulau Telibun, Trang, S.W. Siam. 2nd January 1917. [No. 3811.]

b, c. ♂, ♀ Pasir Raja, Pulau Lontar, S.W. Siam. 10th-12th January 1917. [Nos. 3879, 3932.]

"Iris hazel, bill black, in the female the lower mandible light horn, feet slate or Payne's grey."

In a review of this group (Nov. Zool. ix, pp. 211–212 (1902) Hartert has established a subspecies. *C. viridis viriditectus*, (type from Baram, Sarawak) for the Bornean form based on the fact that the shoulder spot is glistening green without any bluish gloss, and a considerable series from SW. Sarawak confirms his diagnosis. He considers that Malayan birds should also be placed in this race but in this I cannot agree as the majority of our large series precisely agree in the tint of the shoulder spot with a specimen from Rimbo Pengadang, Bencoolen (Jacobson coll.) which is a topotype of *C. zosterops*, Vig.

80. Chloropsis icterocephala chlorocephala, (Wald.).

Chloropsis chlorocephala, *Sharpe, tom. cit.* p. 28, *Robinson and Kloss*, p. 55; *Robinson antea*, vol. V, p. 101; *Robinson Ibis*, p. 745; *Gyldenstolpe*, p. 65.

a. ♂. Pasir Raja, Pulau Lontar, S.W. Siam. 12th January, 1917. [No. 3903.]

"Iris chestnut red, bill black, feet sage green."

Gyldenstolpe (loc. cit.) suggests that *C. icterocephala* may also occur on the southern parts of Siamese Malaya. As a matter of fact several specimens were obtained by Dr. Annandale and myself at Bukit Besar in Patani, though Grant in his report* on the collection has accidentally omitted the precise locality. This species meets and intergrades with *C. icterocephala* in Perlis whence we have a pair which it is impossible to refer definitely to either form.

81. Irena puella cyanea, Begbie.

Irena cyanea, *Sharpe, tom. cit.* p. 179: *Robinson and Kloss*, p. 56.

a-c. 3 ♂ ad. Burau, NW. Langkawi, 12th-14th December 1916. [Nos. 3620, 3630, 3637.]

d-j. 1 ♂ ad. 4 ♂ imm., 2 ♀. Telok Wau, Terutau. 19th-28th December 1916. [Nos. 3662, 3664, 3671-2, 3689, 3713, 3774.]

"Iris carmine, bill and feet black."

Exceedingly common in heavy jungle on Langkawi and Terutau, while a single specimen was obtained in April, 1915, on the small island of Pulau Paya, near Kuala Kedah.

The series of males moulting into the adult plumage confirms Gyldenstolpe's observations on the closely allied race *I. p. puella* from further north (*loc. cit.* p. 66) that the adult livery is acquired by a direct change of colour in the feather without

* Fascic Malay. Zool III, p. 89 (1906).

moult, a possibility that has always been hotly disputed by many biologists.

The southern subspecies is extraordinarily close to the northern and only differs in the relative length of the under tail coverts, which more nearly approach the tip of the tail in the southern than they do in the northern form. There seems to be no tangible difference in size. Wings of Langkawi adult female, 122-128 mm.

82. Hemixus malaccensis (Blyth).

Sharpe, tom. cit. p. 52; *Robinson and Kloss*, p. 56; *Robinson, antea* vol. V, p. 102 (1915).

a. ♀. W. side Pulau Telibun, Trang, S.W. Siam. 1st January 1917. [No. 3804.]

Quite rare in the north of the Peninsula, whence we have three specimens only, not differing from others from the vicinity of the type locality, Malacca.

83. Microtarsus melanocephalos (Gm.).

Micropus melanocephalus, *Sharpe, tom. cit.* p. 65; *Robinson and Kloss*, p. 57. *Robinson, antea*, vol. v. p. 148.

Microtarsus melanocephalus, Gyldenstolpe, p. 66.

a–b. 2 ♂. Pasir Raja, Pulau Lontar, S.W. Siam. 12th January 1917. [Nos. 3904, 5.]

"Iris blue, bill and feet black."

84. Criniger gutturalis ochraceus, Moore.

Criniger sordidus, *Richmond. Proc. U. S. Nat. Mus.* xxii, p. 320 (1900); *Robinson and Kloss*, p. 57; *Robinson, antea, vol.* v, p. 102 (1915).

Criniger ochraceus, *Moore, Cat. Birds Mus. E.I.C.* i, p. 252 (1854); *Robinson, Ibis*, 1915, p. 746;

Criniger gutturalis sordidus, *Gyldenstolpe*, p. 67.

a. ♀. Burau, N.W. Langkawi, 15th December 1916. [No. 3645.]

"Iris chocolate. bill plumbeous, blackish on culmen, tarsi horny pink."

The Bulbuls of this group are extremely closely allied and the several species described are but little more than ill-defined subspecies. From descriptions, I fail to see in what respects *Criniger henrici*, Cust. Bull. Mus. Hist. Nat. Paris, 1896, p. 183, can be distinguished from this form. Gyldenstolpe (*loc. cit.*) lists both, from the same locality, Koon Tan, in Northern Siam.

The present race is common in the Northern Malay Peninsula, becoming slightly differentiated further south.

85. Pycnonotus finlaysoni, Strickl.

Sharpe, tom. cit. p. 144; *Robinson* and *Kloss*, p. 58; *Robinson, antea*, vol. V, p. 149; *Robinson, Ibis*, 1915, p. 747; *Gyldenstolpe*, p. 69.

a–e. 4 ♂, 1 ♀. Telok Wau, Terutau. 20th–28th December 1916. [Nos. 3675, 3697, 3700, 3720, 3778.]

"Iris chestnut, bill black, feet slate."

Extremely common in the north of the Peninsula, largely replacing *P. analis*, which however also occurs; rare and sporadic in the south.

86. PYCNONOTUS PLUMOSUS, Blyth.

Sharpe, tom. cit. p. 152; *Robinson and Kloss*, p. 58.

a–e. West side, Pulau Telibun. 1–3rd. January 1917. [Nos. 3802, 3828, 9.]

"Iris chocolate, reddish or dark red, bill black, feet pinkish brown."

This, is the only one of this group of the genus about which no difficulty arises in identification. Colouration is on the whole very constant, though freshly moulted specimens are darker above than others. Tail and wings always strongly washed with olive green and the ear-coverts with pale shaft stripes.

87. PYCNONOTUS SIMPLEX (Less.).

Sharpe, tom. cit. p. 153: *Robinson and Kloss*, p. 58; *Richmond, Proc. U. S. Nat. Mus.* 26, p. 506 (1903).

Pycnonotus sp. (?) *Richmond loc. cit.* p. 506.

Pycnonotus olivaceus chloeodis, *Oberholser, Smithsonian Misc. Coll.* vol. 60, p. 11 (1912).

a–c. 3 ♀. Telok Wau, Terutau. 20–29th December 1916. [Nos. 3677, 3732, 3794.]

"Iris Indian red, bill dark horn, feet pinkish yellow-horn."

I have compared these and numerous other Malayan birds with three specimens from the West Coast of Sumatra which can be regarded as typical of *P. simplex* (Less.) and also of *P. olivaceus chloeodis*, Oberholser, and can detect no material differences, certainly none that would warrant even subspecific distinction.

The wings of three Sumatran birds are 76, 77, 82, while nine Malayan birds average 81 mm. The Sumatran bird cannot therefore be said to be "larger."

The colour of the irides, relied on by Richmond for separation of species, is quite unreliable. Two Sumatran birds recorded by myself have them "white" and a third by Jacobson "light orange," while the Terutau birds had them as noted above "Indian Red," but they are undoubtedly all the same form.

In any event the Sumatran bird, if distinct, must be called *P. simplex simplex* (Less.) while the Malayan bird (type from Malacca compared) will be *P. simplex brunneus* (Blyth), Journ. Asiat. Soc. Bengal xiv, p. 568 (1842).

88. Pellorneum subochraceum, Swinh.

Sharpe, tom. cit. p. 521; *Robinson and Kloss*, p. 59; *Robinson antea*, vol. V. pp. 103, 149; *Robinson Ibis*, 1915, p. 748; *Gyldenstolpe*, p. 748.

a–b. ♂ ♀. Buran, N. W. Langkawi. 12th December 1916. Nos. 3623, 4.

c. ♂. Pasir Raja, Pulau Lontar, S.W. Siam. 11th January 1917. No. 3884.

"Iris chestnut, orbital space sage green, bill horn, lower mandible yellowish, feet pale yellowish flesh.

Exceedingly common over the whole of the northern third of the Malay Peninsula and in the Langkawi group, frequenting low trees in secondary jungle and shrubs and bushes at the edges of open spaces.

The large series in the F.M.S. Museums shows considerable variation in the depth of tint of the buff on the lower surface and in the width and intensity of the black shaft stripes on the breast as is noted by Gyldenstolpe. The differences are apparently due to age and are not correlated with locality.

89. Malacocincla abbotti (Blyth).

Turdinus abbotti, *Sharpe, tom. cit.* p. 541; *Ogilvie Grant Journ. Fed. Malay States Mus.* iii, p. 29 (1908); *Robinson Ibis*, 1915, p. 749; *Robinson and Kloss*, p. 59.

Turdinus olivaceus, *Robinson antea*, vol. V, pp. 103, 149 (1915).

Turdinus abbotti olivaceum, *Hartert, Nov. Zool.* ix, p. 562 (1902).

Turdinus abbotti abbotti (Blyth) *Gyldenstolpe*, p. 57.

a–b. ♂, ♀ Buran, N. W. Langkawi, 12th December, 1916. [Nos. 3625, 3626.]

c–m. 6 ♂, 6 ♀ Telok Wau, Terutau, 20-28th December, 1916. [Nos. 3667, 3682, 3687, 3690, 3692, 3698, 3706, 3733–4, 3750–1, 3771.]

n–o. ♂, ♀ Pasir Raja, Pulau Lontar, S.W. Siam, 12th January, 1917. [Nos 3908–9.]

"Iris red, reddish chestnut or orange, bill slate, black on culmen, feet flesh or brownish flesh."

Diametrically opposite opinions have been expressed by Grant and Hartert (*loc. cit.*) on the separability of the northern and southern forms of this species, *Turdinus abbotti, Blyth. Journ. Asiat. Soc. Bengal.* xvi, p. 601 (1845), type from Ramree Id., Arakan, and *Malacopterum olivaceum, Strickland, Ann. and Mag. Nat. Hist.* xix, p. 132 (1847), type from Malacca.

As I have suggested elsewhere (Ibis, 1915, p. 749) much of the discrepancy is probably due to the rapidity with which skins of this and other allied Timeliine species fade.

It would seem to be a fact, however, that the majority of southern birds are dull, therein conforming with the diagnosis of *M. a. olivaceum* (Strickl.) while the majority of those from the north are bright, agreeing with *T. abbotti abbotti* (Blyth). This is not, however, universally true in the present series, as the pair from Langkawi, one from Terutau and one from P. Lontar, the most northerly locality visited, are as dull as any from Kuala Lumpur and other parts of Selangor. The remainder, and also specimens collected in 1915 in Langkawi are brighter birds, having the undertail coverts rich buffy rufous, the rufous buff of the flanks carried up high on the sides of the chest. Birds from Trang vary and ones from Perlis are brighter than Selangor and Pahang skins. We have a topotype of *M. a. olivaceum* from Malacca, but it is a native skin so old and deteriorated that no reliable comparison can be made with it. None of the specimens are quite so bright as those obtained by Mr. Kloss on the coasts and islands of SE. Siam and listed by me in the Ibis for 1915.

Gyldenstolpe (*loc. cit.*) is in error in stating that these specimens were referred to *T. a. olivaceum*, though a reference is given to Hartert's discussion of the question under that heading.

Pending the collection of a large series from topotypical localities I have not placed these birds under any subspecific name. I have little doubt however that if *M. a olivaceum* is shown to have any real existence, which for the present must remain an open question, we shall have to call in the aid of a quadrinomial or even quinqenomial system, as is already used in some cases by Hartert, Stresemann and Parrott. If this comes into use at all extensively it becomes an open question whether a return to a bald binomial system is not, after all, the simplest and most convenient plan.

90. Mixornis rubricapilla rubricapilla, *or subsp nov.*

Mixornis gularis, *Sharpe, tom. cit.* p. 576; *Robinson and Kloss*, p. 62 : *Robinson antea*, vol. v, p. 106 (1915); *Gyldenstolpe*, p. 60.

Mixornis gularis rubricapillus, *Robinson antea*, vol. v, p. 149 (1915).

Mixornis gularis rubricapilla, *Robinson, Ibis*, 1915, p. 751.

a. ♀. Burau, N.W. Langkawi, 14th December 1916. No. 3643.

b–g. 3 ♂ 3 ♀. Telok Wau, Terutau, 18th–26th December. Nos. 3655, 3676, 3703, 3726, 3747–8.

h–i. ♂, ♀ W. side Pulau Telibun, Trang, S.W. Siam. 1st–2nd January 1917. Nos. 3803, 3819.

"Iris whitish, whitish yellow or yellowish white, pale yellow or pale orange, bill bluish slate, black on culmen, feet sage green or yellowish green, orbits bluish slate."

Oberholser's unfortunate discovery that Raffles' *Motacilla gularis* hitherto used for this species in its broad sense is preoccupied and therefore untenable throws the whole of the nomenclature of this and allied forms into the greatest confusion.

In the first place it will be generally admitted that the present form and *Motacilla rubricapilla*, Tickell, Journ. Asiat. Soc. Bengal, p. 576 (1833) from eastern Bengal are only subspecifically distinct. As a group name Tickell's will therefore take precedence of *Prinia pileata*, Blyth, Journ. Asiat. Soc. Bengal, xi. p. 204 (1842) from Malacca, which Oberholser substitutes for *gularis*.

In 1850 Bonaparte (Conspectus Av. i, p. 217), misled by Horsfield's bad figure of *Timalia gularis* Zool. Res. Java. (1824, and assuming that the bird came from Java, which was not the case, renamed the Sumatran bird as *M. sumatrana* with the brief but sufficient diagnosis "Minor subtus cum gula flavissima."

Himalayan birds are also described under the names *Iora chloris*, Blyth, Journ. Asiatic. Soc. Bengal, xi, p. 794 (1842) and *Mixornis ruficeps*, Hodgson, P.Z.S. 1845. p. 23, these names being pure synonyms of each other.

In 1900 Col Rippon described* (Bull. Brit. Orn. Club. xi, p. 11), under the name *Stachyridopsis sulphurea* from Namchet, S. Shan States, what is only a form of this species, and finally Gyldenstolpe describes yet another race from North Siam as *Mixornis gularis minor*.

These last two forms (I have examined Rippon's type) are probably pure synonyms of each other, the race being distinguished, apart from its somewhat small size, by the clear yellow underparts, the reduction of the shaft stripes on the throat to mere hair lines and by great diminution of the chestnut tinge on the cap, mantle and external aspect of the wings. The form, spread over the greater part of Tenasserim, the southern parts of Siam and the northern third of the Peninsula is fairly uniform in character and in the absence of direct comparison with topotypes of Tickell's *M. rupricapillus*, cannot be separated from that form. It has had, at present no subspecific name assigned to it. In the central section of the Malay Peninsula it grades into the next form, *M. r. pileata*, which is characterised by the somewhat richer coloured undersurface, less tinged with glaucous green and by its slightly smaller size. The shaft stripes on the throat are broader and the chestnut cap more sharply defined. This form extends from Central Perak down the Peninsula and is also found on the Rhio Archipelago. We possess topotypes from Malacca.

Finally the Sumatran bird is just separable by still richer colouring, shaft stripe very strongly marked and extending on to the flanks. Lores and superciliary feathers dark. This is *Mixornis rubricapilla sumatrana*, *Bp.*

* *Smithsonian Misc. coll* Vol. 60, p. 9 (1912).

The races are therefore:—

Mixornis rubricapilla rubricapilla (Tick.). Eastern Bengal, Tenasserim, Southern Siam and Indo-china and North Malay Peninsula.

Mixornis rubricapilla chloris (Blyth), Sub-Himalaic tracts, Nepal to Horam, North Shan States.

Mixornis rubricapilla sulphurea (Rippon). Southern Shan States and N and N.E. Siam.

Mixornis rubricapilla pileata (Blyth). Southern half Malay Peninsula and Rhio Archipelago.

Mixornis rubricapilla sumatrana Bp. Sumatra.

*Mixornis rubricapilla zaptera** Oberholzer. Tana Masa, Batu Islands, W. Sumatra.

Mixornis rubricapilla zarhabdota,† Oberholzer. Pulau Bangkaru, Banyak Islands, W. Sumatra.

91. Myiophoneus eugenei crassirostris, Robinson.

Myiophoneus crassirostris. *Robinson, Bull. Brit. Orn. Club*, xxv, p. 98; (1910); *Robinson and Kloss, Ibis*, 1911, p. 62.

a–e. 2 ♂ ad., 1 ♀ ad. 1 ♂ imm. 1 ♀ imm. Telok Wau, Terutau, 17-25th December, 1916. [Nos. 3650, 3679, 3696, 3724, 3735.

f. ♀. imm. Koh Muk (Pulau Muntia), Trang, S.W. Siam. 4th January, 1917. No. 3837.

g–h. 2 ♂ ad. Pasir Raja (Pulau Lontar), S.W. Siam. 10-11th January, 1917. Nos. 3874, 3886.

"Iris dark, bill yellow, black on culmen, feet black."

Fairly common in heavy jungle on the hills, generally in gullies and watercourses.

There is great variation in the very considerable number of adult specimens of this form now in the collection from the mainland of Trang and Perlis and from Langkawi and Terutau. All adults have the pale white spots on the wing coverts present though in a varying degree, these being hardly discernible in one bird from P. Lontar. They are also present in most immature birds which entirely lack the glistening tips to the feathers above and are dull black beneath.

There is considerable sexual variation in size, males being much the larger. It is evident that the form is intermediate between *M. temminckii*, which has a very wide range in continental India, ranging south to Aracan and Burmah and *M. eugenii*, which does not seem to be known West of the Salwin.

If the locality of the specimen of *M. crassirostris* mentioned by Gyldenstolpe, p. 62, viz., Java, is correct, I think that the identification will have to be revised as the specimens would almost certainly be referable to *M. flavirostris*, of which a closely related form, *M. dicrorhynchus*, Salvad. is met with in the south of the Malay Peninsula and in Sumatra.

* *Smithsonian Misc. Coll.* Vol. 60, p. 9 (1912)

92. Herpornis zantholeuca xantholeuca (Hodgs.).

Herpornis zantholeuca, *Sharpe, tom. cit.* p. 636; *Robinson and Kloss*, p. 63; *Robinson, antea*, vol. v, p. 107 (1915); *Gyldenstolpe*, p. 62.

a–b. 2 ♀. Burau, NW. Langkawi, 14th December, 1916. No. 3638.

"Iris reddish, bill pale horn, darker on culmen, yellowish at base, feet pale pinkish flesh."

Fairly common at this one locality on Langkawi in open ground near the sea. Widely distributed throughout the Peninsula and very constant in characters, rather more abundant in the north.

93. Geocichla citrina citrina (Lath.).

Geocichla citrina, *Hume, Stray. Feath.* vi, p. 250 (1878) *Seebohm. Cat. Birds, Brit. Mus.* v, p. 176 (1881); *Robinson and Kloss*, p. 63; *Gyldenstolpe*, p. 46.

a. ♂. Pulau Dayang Bunting, Langkawi, 9th December 1916. [No. 3617.]

b. ♀. Pasir Raja, Pulau Lontar, S.W. Siam. 12th January 1917. [No. 3895.]

"Male. Iris dark, bill dark greenish black, feet pinkish flesh tinged with yellow. Female. Iris hazel, bill upper mandible dark horn, lower bluish horn, feet yellowish pink horn."

Besides the above series we have twelve specimens of both sexes shot in various localities in Trang and on Terutau and Langkawi from November to March and a fine adult male from Menuang Gasing, 3-4,000′, Ulu Langat, Selangor, February 7th 1912.

There has been much discussion and difference of opinion on the point as to whether *Geocichla innotata*, Blyth, Journ. Asiat. Soc. Bengal, xv, p. 370 (1846), described vaguely as from "Malacca" has any claims to even subspecific rank.

The "species" is supposed to differ in richer colour above and in the total absence of white markings on the wing coverts. As regards the tint there is very large variation, both sexual and individual, in specimens with markings on the wings (*G. citrina*) and this character can therefore be disregarded. The white tips to the wing coverts are very variable and specimens lacking or nearly lacking them occur together with those in which they are highly developed. It may further be noted that with the exception of the above-mentioned specimen from the mountains of Selangor, which has strongly marked white patches on the wings, no exactly localised specimens of any *Geocichla* of this type has ever been obtained in the Malay Peninsula south of Penang.

Specimens vaguely labelled "Malacca" or of Malacca "make" may have come from almost anywhere especially since until recent years bird skins were a large export from the territory and the collection thereof a trade which afforded occupation to considerable numbers of hunters who travelled far in pursuit of it.

The specimens collected by Mr. Kloss on the coasts and islands of S.E. Siam, *Ibis* 1915, p. 752 were certainly all *G. innotata*, in that they lacked the wing spots, but his series was small. Possibly Blyth's original locality was incorrect and the real locality of his types was Siam or Indo-China. I am inclined to think that the species is, at anyrate partially, migratory, which would account for its sporadic appearance in the more southern parts of the Malay Peninsula and for its greater abundance in the north of the Peninsula during the winter months.

94. Turdus obscurus (Gm.).

Robinson and Kloss, p. 64; *Robinson, Ibis*, 1915. p. 753; *Gyldenstolpe*, p. 47. *Hartert, Vög. Pal. Faun.* i, p. 656 (1910).

a-d. 2 ♂, 2 ♀. Telok Wau, Terutau. 19th-28th December 1916. [Nos. 3663, 3746, 3758. 3775].

e. 1 ♂. Pasir Raja, Pulau Lontar, S.W. Siam. 12th January 1917. [No. 3897].

"Iris hazel, bill yellowish horn, tip and culmen dark ashy, feet yellowish horn."

Common in Trang and on the islands during the winter months; in the south of the Peninsula found, as a rule, only on the tops of the mountains, presumably on passage.

95. Monticola solitarius pandoo (Sykes).

Petrocincla pandoo, *Sykes, P.Z.S.* 1832, p. 87.

Petrophila solitaria, *Robinson and Kloss*, p. 64.

Monticola cyanea, Linn; *Gyldenstolpe*, p. 47.

Monticola solitarius pandoo, *Hartert, Vög. Pal. Faun.* i, p. 675 (1910).

a. ♀. Pulau Pandan, nr. Langkawi, 15th March, 1909. [F.M.S. Mus. 406/09.]

b. ♀. Gantang, Trang, S.W. Siam. 12th December, 1909.

C. ♂. Lem Pia, N. Telibun Straits, Trang, S.W. Siam. Jan. 3rd 1917. [No. 3825.]

d. ♂. W side Pulau Telibun, Trang, S.W. Siam. 1st January, 1917. [No. 3801.]

e–f. ♂. Batu Caves, nr. Kuala Lumpur, Selangor. 3rd August, 1908 and 24th January, 1912.

g. ♀. Batu Caves, nr. Kuala Lumpur, Selangor. 24th May, 1910.

"Iris hazel, bill and feet slaty black, gape yellow."

These specimens have the wing 113-124 mm. in the males, and 112-118 in the two measurable females and have no chestnut whatever in the plumage. The bird from P. Telibun is of a somewhat lighter blue and has traces of the black and white terminal tips to the feathers being the remains of the immature pelage. The series must apparently be referred to Sykes' subspecies originally described from the Western Ghats, India.

96. Monticola solitarius philippensis (P.L.S. Müll.).

Hartert, *Vög. Pal. Faun.* i. p. 675 (1910); *Robinson, Ibis*, 1915, p. 752; *Gyldenstolpe* p. 48.

a. ♂. vix ad. West Side, Pulau Telibun, Trang, S.W. Siam. Jan. 1st 1917. [No. 3807.]

This specimen has the remains of the immature pelage strongly in evidence; the undertail coverts are however mainly chestnut as are also a few of the under wing coverts and feathers of the belly. The wing is 118. The chestnut is very much less developed than in a specimen from Lem Ngop, S.E. Siam, collected by Mr. Kloss on January 15th 1915, but it is, I think best, placed with this form, though it must be admitted that the identification of two birds, shot within a few yards of each other on the same day (see above) as different subspecies is not very convincing, even on the assumption that the entirely blue bird is a winter visitor from the NW. while the chestnut form comes from the NE. The north of the Malay Peninsula is however indubitably the meeting place of easterly and westerly migration streams.

97. Larvivora cyanea (Pall.).

Robinson and Kloss, p. 64, *Robinson, antea*, V, p. 149 (1914); *Gyldenstolpe*, p. 49.

a. ♀. Telok Wau, Terutau, 19th December, 1916. [No. 3670.]

b. ♀. Pasir Raja, Pulau Lontar, SW. Siam, 11th January, 1917. [No. 3889.]

"Iris hazel, upper mandible black, lower flesh at base, feet pale, whitish flesh."

As has already been noted by Gyldenstolpe and myself this species is not improbably resident throughout the year in the north of the Peninsula, specimens having been obtained as late as May 15th. In the south of the Peninsula it certainly only occurs during the winter months.

98. Kittocincla macrurus macrurus, (Gm.)

Cittocincla macrura, *Robinson and Kloss*, p. 65; *Robinson, antea*, V, pp. 108, 150.

Kittacincla macrurus macrurus, Hartert, Nov. Zool. ix, p. 572 (1902); *Robinson, Ibis* 1915, p. 753.

Kittacincla macrurus tricolor (part.) *Gyldenstolpe*, p. 50.

a–b. 2 ♂ ad. Pulau Dayang Bunting, Langkawi, 8-9th December 1916. [Nos. 3608, 3615.]

c–h. 5 ♂, 1 ♀. Telok Wau, Terutau, 19th–28th December 1916. [Nos. 3665-6, 3686, 3695, 3757, 3782.]

i–j. 2 ♀ *ad.* W. side Pulau Telibun, Trang, S.W. Siam. 2nd–3rd January 1917. [Nos. 3812, 3823.]

k. 1 ♂ ad. Koh Muk, Pulau Muntia, Trang, S.W. Siam. 5th January 1917. [No. 3853.]

"Iris hazel, bill black, feet fleshy white."

Hartert (*loc. cit.*) has dealt exhaustively with the races of the Shama but it is still somewhat uncertain in what districts the Indian race, *K. m. tricolor* (Vieill.) meets the Malayan and Indo-Chinese *K. m. macrurus* (Gm.).

The F.M.S. Museums possess large series of Shamas from the central and southern parts of the peninsula but the vast majority of the specimens are either fully adult males or immature birds and we are unaccountably deficient in adult females. The adult males vary greatly in the depth of chestnut tint on the undersurface and it is admittedly impossible to separate Indian and Indo-Malayan birds when this sex only is examined, but the female of *K. m. tricolor* is stated to be very much paler than that of *K. m. macrurus*. The three females in the list detailed above are decidely paler than two adults from Selangor and it is possible that the birds from North Malay Peninsula and South Siam are intermediate. Among adults differences occur in the colour of the thighs, some having these parts white, with black bases to the feathers and others having them very strongly washed with chestnut but the differences are not apparently associated with locality.

Shamas (*murai batu* of the Malays) are very common on most islands off the coast, especially where these are high and rocky but are very much scarcer on the mainland or in flat country.

99. Orthotomus atrigularis (Temm.)

Sharpe, tom. cit. p. 220; *Robinson and Kloss*, p. 66; *Robinson antea*, vol. V. pp. 108, 150 (1915).

a. ♀ imm. Pulau Dayang Bunting, Langkawi. 30th November 1907.

b. ♂ ad. Pulau Langkawi, 18th February 1909.

c–d. ♂ ad, ♀ imm. Telok Wau, Terutau, 29th December 1916. [Nos. 3795, 6.]

Distributed throughout the Peninsula but especially common on the islands.

100. Phylloscopus superciliosa superciliosa (Gm.).

Hartert, Vög. Palaarkt. Band. I, p. 518 (1909); *Robinson, Ibis*, 1915, p. 755.

Phylloscopus superciliosus (Gm.) *Seebohm, Cat. Birds Brit. Mus.* V, p. 68 (1881); *Robinson and Kloss*, p. 66.

a–d. 2 ♂, 2 ♀. Telok Wau, Terutau. 19-29th December, 1916. [Nos. 3669, 3722, 3788-9.]

e. ♂. W. side Pulau Telibun, Trang, SW. Siam, 3rd January, 1917. [No. 3832.]

"Iris dark hazel, bill brownish horn, greater part of lower mandible and gape yellowish, feet dark greyish green or yellowish brown."

Fairly common in the islands. We found this species abundant on the mainland of Trang in December, 1910. A male from Taiping, Perak, shot on January 7th 1910, represents the southernmost locality from which the species has been obtained and is the only record for the British portion of the Peninsula.

101. Phylloscopus borealis borealis (Blas).

Phylloscopus borealis, *Seebohm, Cat. Birds Brit. Mus.* V, p. 40 (1881); *Robinson and Kloss*, p. 65; *Robinson, antea*, vol. V, p. 150 (part.) (1915).

Phylloscopus borealis borealis, *Hartert, Vög. Palaarkt. Faun.* I, p. 517 (1909); *Robinson, Ibis*, 1915, p. 754; *id. antea*, vol. VI, p. 232 (1916).

a. ♂. Burau, N.W. Langkawi, 14th December, 1916. No. 3641.

b–c. 2 ♀. Telok Wau, Terutau, 17-26th December, 1916. Nos. 3649, 3745.

d. ♂. Pulau Butang, Butang Archipelago, 20th April, 1911.

"Iris dark, bill wax yellow, dark on culmen, tarsi greenish yellow, wax yellow darker in front, or yellowish brown."

These birds have the wing 62, 62, 66, 66 mm., with a small first primary just reaching or very slightly exceeding the primary coverts. They agree with a series obtained from near the summit of Kedah Peak in December, 1916.

102. Phylloscopus borealis xanthodryas (Swinh.)

Phylloscopus zanthodryas, *Swinh. P.Z.S.* 1863, p. 296.

Phylloscopus borealis zanthodryas, *Hartert, loc. cit.* p. 518.

Phylloscopus borealis, *Robinson, antea*, vol. V, p. 150 (1915).

a. ♂. Pulau Butang, Butang Archipelago, 21st April, 1911.

b. ♂. S.W. Koh Pennan, Bandon Bight, S.W. Siam. 30th May, 1913.

These specimens agree with the descriptions of this subspecies in that they are considerably larger than the typical form (wing 72 mm.), are lighter and more yellowish beneath and possibly more greenish above, though specimens in differing states of plumage vary so much that it is difficult to determine this point.

The Koh Pennan specimen has a large first primary extending about 3 mm. beyond the primary coverts but that from P. Butang can be matched in this by others from Kedah Peak and the south of the Peninsula. Another bird from P. Butang shot on 20th April 1911, has the wing 60 mm. Specimens from S.W. Sarawak shot in November are rather bright but have the wing 66 mm. and are not this form, which, like so many migrant birds, appears only to reach N. Borneo.

103. Lanius tigrinus, Drap.

Hartert, Vög. Palaarkt. Faun. I, p. 442 (1907); *Gyldenstolpe*, p. 39.

a-b. ♂ imm., ♀ imm. Telok Wau, Terutau. 21st-26th December 1916. [Nos. 3691, 3753.]

c-e. ♀ ad. Pulau Paya, near Kuala Kedah. 24th-25th April 1915.

"Iris dark, bill pale pinkish horn, dark at tip, feet pale slate."

Common throughout the Peninsula throughout the winter months though specimens in the adult plumage are always in the large minority.

104. Lanius cristatus cristatus, Linn.

Lanius cristatus, *Gadow, Cat. Birds Brit. Mus.* viii, p. 271 (1883); *Robinson and Kloss*, p. 69.

Lanius cristatus cristatus, *Hartert, Vög. Palaarkt. Faun.* I, p. 446 (1907).

Otomela cristata, *Gyldenstolpe*, p. 41.

a. ♀ ad. Kuah, Langkawi. 23rd April 1915.

A nearly adult female evidently on passage. This form is very common throughout the Malay Peninsula in September and October and in March and April. A few appear to stay throughout the winter. Much the commonest of the allied forms locally.

105. Lanius cristatus superciliosus, Lath.

Hartert, loc. cit. supra, p. 447.

a. ♂ ad. Pulau Paya, near Kuala Kedah, 23rd April 1915.

A very fine adult bird.

106. Lanius cristatus lucionensis, Linn.

Lanius lucionensis, *Gadow, tom. cit.* p. 274; *Robinson and Kloss*, p. 69.

Lanius cristatus lucionensis, *Hartert, tom. cit.* p. 447.

a. ♀ ad. Langkawi. 30th March 1909.

107. Gracula javana javana (Osbeck).

Mainatus javanensis, *Sharpe, Cat. Birds Brit. Mus.* xiii, p. 102 (1890).

Eulabes javanensis, *Robinson and Kloss*, p. 67.

Gracula javana javana, *Stresemann, Nov. Zool.* xix, p. 314 (1912).

a. ♂. Pulau Dayang Bunting, Langkawi, 8th December 1916. No. 3610.

b. ♂. Koh Muk (Pulau Muntia) Trang, S.W. Siam. 5th January 1917. No. 3852.

c. ♂. Pasir Raja, Pulau Lontar, S.W. Siam. 10th January 1917. No. 3878.

"Iris hazel, lappets rich chrome, anterior greenish at base, bill orange, yellow at tip, tarsi rich chrome."

The specimen from Pulau Lontar shows an approach to *G. j. intermedia* in its smaller size, wing 167 against 182 in the Dayang Bunting bird, but the postocular space is entirely separated from the lappets by a patch of feathers, while the bill is not nearly so small as in true *intermedia*. It is possible that the Hainan and Eastern Siamese birds should after all be separated also, as *Gracula javana hainanus* (Swinh.), as Hartert seems inclined to do (Nov. Zool. xvii, p. 251 (1910). In these the general size is strikingly smaller, especially in the bill, and the lappets are also apparently considerably diminished.

This Mynah was very common on all the islands, especially on Terutau.

108. Aplonis panayensis strigatus (Horsf.).

Calornis chalybea (Horsf.); *Sharpe, tom. cit.* p. 143; *Robinson and Kloss*, p. 68; *Robinson, antea* vol. v, p. 151.

Aplonis panayensis strigatus>affinis, *Stresemann, Nov. Zool.* xx, p. 376 (1913).

a. ♀. Lem Pia, N. Side Telibun Straits, Trang, SW. Siam. 3rd January, 1917. No. 3834.

"Iris carmine, bill and feet black."

It is unfortunate that the name *strigatus* applied to the immature bird by Horsfield, but which is printed earlier in the same page should have to replace the more familiar *chalybea*.

Stresemann is probably correct in regarding all the forms of the genus occurring in the Oriental region as merely of subspecific value and basing them on the first decribed, viz.

Muscicapa panayensis, Scop. Del. Flor et Faun. Insubr. ii, p. 96, (1783) from the Philippines.

He is also correct in stating that there is a gradual transition from *A. p. strigatus* to *A. s. affinis* from Tipperah and Cachar, which is a larger bird with a more reddish violet sheen on the lower surface. It should be mentioned however that Hume (*Stray Feath.* vi, p. 394) absolutely denies that these differences exist.

The species is evidently extremely plastic and varies greatly in many of the small islands in the Malaysian area principally in size, in the development of the bill and in the degree and tinge of the metallic sheen on the plumage, some forms being almost dull black.

109. ANTHUS RICHARDI MALAYENSIS (Eyton.)

Anthus malayensis, *Eyton P. Z. S.* 1839, p. 104.

Anthus richardi malayensis, *Stresemann, Nov. Zool.* xix, p. 316 (1912).

Anthus malayensis, *Robinson and Kloss. Ibis*, 1911, p. 74; *Robinson J., F.M.S. Mus.* V, p. 151 (1914).

Anthus rufulus (part.) *Sharpe, Cat. Birds Brit. Mus.*, x, p. 574.

Corydalla malayensis, *Hume, S. F.* viii, p. 65 (1879).

a. ♀. ad Pulau Langkawi. 17th February, 1909.

b. ♀. ad Pulau Langkawi. 27th September, 1915.

Wings 82, 77; Tarsi 29, 27.

This is a resident bird in the Malay Peninsula, whence no reliably identified examples of other races have been recorded. Stresemann's method of treating *rufulus* as a race of *richardi* and *malayensis* as its Malayan representative seems the most satisfactory way of regarding this bird.

110. DICRURUS ANNECTANS (Hodgs.)

Sharpe, tom. cit. p. 231; *Robinson and Kloss*, p. 72; *Robinson, Ibis*, 1915, p. 761.

a. ♀. imm. Telok Wau, Terutau. 20th December 1916. [No. 3680.]

b–c. 2 ♂ ad. W. side Pulau Telibun, Trang, S.W. Siam. 1–2nd January 1917. [Nos. 3806, 3810.]

"Iris carmine, bill and feet black."

This species is certainly merely a winter visitor to the Malay Peninsula and Straits of Malacca and no specimen has been obtained between the months of April and September. Immature birds indicated by the large amount of white in the plumage are always in the great majority. Little is known definitely of its distribution in the Indian Empire but it appears probable that it is a breeding bird in Upper Assam and the lower Himalayan foothills, west to Nepal.

111. Dissemurus paradiseus paradiseus (Lainn.).

Dissemurus paradiseus, *Sharpe, tom. cit.* p. 225; *Robinson and Kloss*, p. 71; *Robinson antea*, vol. v., pp. 109, 150; *Hartert. Nov. Zool.* ix, pp. 579, 580.

Dissemurus paradiseus paradiseus, *Robinson, Ibis*, 1915, p. 760.

a–d. 2 ♂, 2 ♀. Telok Wau, Terutau. 19–24th December 1916. [Nos. 3661, 3688, 3712, 3727.]

e–f. ♂ ♀. Pasir Raja, Pulau Lontar, S.W. Siam. 9–12th January 1917. [Nos. 3870, 3894.]

"Iris carmine, bill and feet black."

Common on all the islands and on the adjacent coast.

Regarded as a species in the old-fashioned sense, this King Crow, ranging as it does over the whole oriental region, probably exhibits greater variation than almost any other species within the area.

While it is indubitably true that too many nominal species have been founded on material deficient both in numbers and in range, the converse is undoubtedly true and at the present time it is not possible to maintain that only one species can be maintained. Without going into the whole question, which the material at my disposal does not admit of, it may be stated that so far as material from Java, Borneo, Sumatra and nearly the whole length of the Peninsula shows, we can recognize the following forms.

1. A form with a fairly full, compressed and recurved crest with large rackets and a wing of more than 150 mm. = *Dissemurus paradiseus paradiseus* (Linn.).

Tenasserim, Northern two-thirds of the Malay Peninsula, Southern Siam, Sumatra and Java. *D. rangoonensis*, Gould, is probably synonymous.

2. A form with the crest less developed, slightly shorter wing and smaller rackets = *Dissemurus paradiseus platurus* (Vieill.)

Inhabits the extreme south of the Peninsula, the Rhio Archipelago, Java and Sumatra and is connected with the foregoing by intermediate specimens in the central third of the Peninsula.

3. A still smaller form, wing about 140 mm., tail rackets still more reduced and with practically no crest = *Dissemurus paradiseus brachyphorus*, Bp. Inhabits Borneo.

112. Oriolus melanocephalus, Linn.

Robinson and Kloss, p. 72; *Gyldenstolpe*, p. 23.

a. ♂ ad. Lem Pia, N. side Telibun Straits, Trang, S.W. Siam, 3rd January 1917. [No. 3833.]

"Iris red, bill pink, feet greenish grey."

Also occurs in Langkawi, this being its southernmost recorded locality.

113. Oriolus indicus, Jerd.

Robinson and Kloss, p. 72; *Robinson, Ibis*, 1915. p. 758; *Gyldenstolpe* p. 22.

a.–b. ♀ ad., ♀ vix ad. Telok Wau, Terutau, 21–23rd December 1916. [Nos. 3693, 3711.]

c–e. ♂ ad., 2 ♀ imm. Koh Muk (Pulau Muntia) Trang, S.W. Siam, 4–6th January, 1917. [Nos. 3845, 3860–1.]

f. ♂ ad. Pasir Raja, Pulau Lontar, S.W. Siam. 12th January, 1917. [No. 3891.]

"Iris red, bill pinkish horn, feet slate."

Very common in the winter months all over the north of the Peninsula; scarcer in the south. None of the specimens show any approach to the allied. *O. tenuirostris*, which differs in the much narrower black nuchal band and the broader yellow tips to the tail feathers. It has been recorded from the extreme south of Tenasserim but never from within Peninsular limits.

114. Corvus macrorhynchus, Wagl.

Robinson and Kloss, p. 71; *Robinson, antea*, vol. V, p. 150; *Robinson, Ibis* 1915, p. 761; *Gyldenstolpe*, p. 16.

a. ♂ Burau, NW. Langkawi, 14th December, 1916. [No. 3634.]

b. ♂ W. side Pulau Telibun, Trang, S.W. Siam, 3rd January 1917. [No. 3831.]

"Iris grey or hazel, bill and feet black."

Common at the fishing stations along the coast as elsewhere in the Malay Peninsula where this bird rarely occurs in the inland districts, where its place is taken by the totally different *C. compilator*, Richmond, *C. enca*, Horsf.

These specimens, which are in freshly moulted plumage, have the throat and back well developed and except on the head and neck are glossed with purplish and green, the former predominant. The bases of the feathers are dull grey but in two others from Langkawi and Terutau these are much paler, while a male from Trang has them nearly white. The whole series from the Malay Peninsula is somewhat variable in this respect as also in size, and in view of the fact that Stresemann's recent monograph on the group (*Verh. Ornith. Ges. Bayern*, xii, pp. 377–404 (1916) is not accessible to me I do not propose to attach any subspecific name to these birds. Wing 335 and 338 mm.

115. Dicaeum cruentata ignita (Begbie).

Dicaeum cruentatum, *Sharpe, tom. cit.* p. 15; *Robinson and Kloss*, p. 78.

a. ♂. Telok Wau, Terutau, 23rd-29th December 1916. [Nos. 3714-7, 3737, 3772, 3790].

"Iris dark hazel, bill and feet black, basal half of bill slaty."

In view of Gyldenstolpe's identification of specimens from Koh Lak, Siamese Malaya, with the reputed Chinese and Hainan form, *D. c. coccinea*, (Scop)., I have again gone through very carefully the very large series of this species in the F.M.S. Museums, in the light of Hartert's remarks on the subject, Nov. Zool. xvii, p. 243 (1910).

Begbie's specimens came from somewhere near Kessang in the territory of Malacca, and it is therefore hardly legitimate to regard specimens from Terutau, 400 miles to the north, as strictly representative of his *Nectarinia ignita*. Our specimens are by no means uniform and while the majority have the outer aspect of the wing glossy purplish one or two have the lesser wing coverts and scapulars with a distinct oily green gloss without purplish. Specimens from Trang are the same but those from Koh Pennan and Koh Samui have but little purple tinge and must therefore be regarded as *D. c. coccinea* if we are to recognise that form. In addition these specimens have the red parts of the plumage more vermilion and less scarlet, but this may be due either to age of the bird or of the feathers. The females are certainly not more rusty orange above as Hartert says is the case with Hainan specimens. Hartert has not defined the limits of his three forms, at least so far as the typical *D. c. cruentata* is concerned and it would appear that they all converge somewhere in the region of Southern and Western Siam.

116. Dicaeum trigonostigma (Scop.).

Sharpe, tom. cit. p. 38; *Robinson and Kloss*, p. 78; *Robinson, antea*, vol. v, p. 110 (1915).

a-f. 4 ♂, 2 ♀. Telok Wau, Terutau. 17th-23rd December. Nos. 3647-8, 3684-5, 3718-9.

"Iris dark, bill plumbeous green, feet slate."

Common nearly everywhere in the Peninsula.

117. Dicaeum chrysorrhoeum, Temm.

Sharpe, Cat. Birds Brit. Mus. x, p. 44 (1885); *Robinson and Kloss*, p. 78; *Robinson, Ibis*, 1915, p. 756; *Gyldenstolpe*, p. 36.

a, b. 2 ♂. Telok Wau, Terutau. 21st-28th December 1916. Nos. 3707, 3776.

Rather rare in the north of the Peninsula; we have only one specimen from Trang.

118. Cyrtostomus flammaxillaris (Blyth).

Cinnyris flammaxillaris, *Gadow, tom. cit.* p. 83.

Cyrtostomus flammaxillaris, *Robinson and Kloss*, p. 74; *Robinson, antea* vol. v, p. 151 (1915); *Gyldenstolpe*, p. 33.

a. ♂. Telok Wau, Terutau. 27th December 1916. [No. 3766].

Common in Trang, on Terutau and Langkawi and also on the Butang Archipelago further west, extending as far south as Penang Island. In the Malay Peninsula is a littoral and open country species not found in heavy forest.

119. Leptocoma brasiliana (Gm.).

Certhia brasiliana, *Gm. Syst. Nat.* I., p. 474 (1788); *Oberholser, Smithsonian Misc. Coll.* 60, p. 18 (note) (1912).

Leptocoma hasselti, *Robinson and Kloss*, p. 77; *Robinson, Ibis*, 1915, p. 757: *Robinson, antea*, vol. V, p. 152.

a. ♂. Burau, NW. Langkawi. 14th December 1916. No. 3635.

"Iris, bill and feet black."

Abundant along both coasts of the Peninsula, from Singapore to the extreme north, but never, so far as my experience goes, at any distance from the sea. Possibly because, like many of the family, this species likes sunny, open spaces and flowering shrubs.

Aethopyga siparaja cara, Hume.

Aethopyga cara, *Hume, Stray Feath.* ii., p. 473 (1874); *Robinson, antea*, vol. v, p. 151 (1915).

Aethopyga siparaja, *Robinson and Kloss*, p. 74.

Aethopyga siparaja cara, *Robinson, Ibis*, 1915, p. 757.

a. ♂. Burau, N.W. Langkawi. 12th December 1916. [No. 3622.]

b–d. 2 ♂, ♀. Telok Wau, Terutau, 26th–29th December 1916. [Nos. 3743–4, 3791.]

"Iris dark, upper mandible black, lower yellowish brown, feet dark brown."

Rare on Langkawi, fairly common on Terutau among the mangroves and on bushes in open country bordering heavy jungle.

Comparison with topotypical specimens of the true *Ae. siparaja* (Raffles) from West Sumatra, confirms the differences already noted between these forms and in addition it would appear that in *Ae. s. cara* the metallic feathers of the crown extend further back, almost to the level of the ear-coverts.

120. Anthothreptes malaccensis (Scop.)

Robinson and Kloss, p. 76; *Robinson, antea*, vol. V, p. 152; *Robinson, Ibis*, 1915, p. 757; *Gyldenstolpe*, p. 34.

a–i. 4 ♂ ad 1 ♂ imm. 4 ♀. Telok Wau, Terutau. 21–28th December 1916. [Nos. 3708, 3754, 3762–3, 3767–9, 3683.]

j–k. 1 ♂ ad., 1 ♂ imm. West Side, Pulau Telibun, Trang, S.W. Siam. 1st January. [Nos. 3798–9.]

"Iris chestnut, bill black, feet dull yellowish green."

Common, as elsewhere, wherever there were coconut palms.

121. Chalcostetha calcostetha (Jard.)

Chalcostetha insignis (Jard.); *Gadow, Cat. Birds Brit. Mus.* ix, p. 12 (1884).

a–d. 4 ♂. Telok Wau, Terutau. 27th–28th December 1916. [Nos. 3764–5, 3780, 3793].

This gorgeous sunbird is almost entirely confined to the mangrove zone where in certain localities it is very common. We have it from Penang; Pulau Pintu Gedong, Selangor Coast; Pulau Tinggi and Pulau Sri Buat, East Coast, Malay Peninsula.

For the inconvenient change of name from the more familar *Ch. insignis* cf. *Oberholser, Smithsonian Misc. Coll.* 60, p. 17 (1912).

112. Chalcoparia singalensis (Gm.).

Motacilla singalensis *Gm. Syst. Nat.* I. pt. 2, p. 964 (1879); *Oberholser, Smithsonian Misc. Coll.* 60, p. 21 (1912).

Chalcoparia phoenicotis (Temm.) *antea*, vol. v, p. 106; *Gyldenstolpe*, p. 34.

a. ♂. Telok Wau, Terutau. 29th December 1916. [No. 3792].

Oberholser (loc. cit.) has pointed out that though the locality is erroneous Gmelin's *Motacilla singalensis* is the first name for this species and must be used and he has designated Malacca as the type locality.

C. phoenicotis (Temm.) Pl. Col. 108, fig. 1; 388, fig. 2 (1824), type from Java, is available as a name for the Indo-Malayan bird from Java, Borneo and Sumatra if separable, which on comparison of birds from Selangor with one from the West Sumatran coast appears not to be the case.

The Continental bird, except that from "Malacca" is at present without a name, but the adult bird from Terutau above listed and a female from Bandon appear to differ from Southern Malayan specimens in having the yellow of the lower surface decidedly brighter and less green and the rufous of the throat and upper breast somewhat lighter and not carried so far down. Wing about 53 mm. in the specimens above mentioned.

XXII. BELIEFS, CUSTOMS, AND FOLK-TALES OF THE BEHRANG-VALLEY SENOI.

By IVOR H. N. EVANS, *Assistant Curator & Ethnographical Assistant, Federated Malay States Museums.*

Early in the present year (1917) I had an opportunity of visiting a small group of Sakai who were living near the Behrang River, in Perak, about eight miles north of Tanjong Malim. As they were a somewhat civilized community their technology was not particularly interesting, since they had given up making many of the articles worn, or used, by the wilder tribes. I spent rather more than a fortnight in their village, and found them friendly and willing to give information with regard to their beliefs and customs. They told me that they maintained relations both with the *Sĕnoi* (Sakai) of the Slim Valley, whom they called *Mai Slip*, and with the tribe, seemingly of mixed Sakai-Jakun origin, which lives near Kerling in Selangor, and speaks Malay as its mother-tongue. These are the nearest neighbours of the Behrang *Senoi*, who inhabit the neighbourhood of the Behrang and of the Bil Rivers. The Kerling people they allude to as *Mai Mĕluar* (outside people), or sometimes as *Mai Renyap*, from the fact that they use a word "*nyap*" meaning "is not," in their dialect, which is equivalent to the ordinary Malay phrase *tiada*.

Marriages between Behrang *Senoi* and *Mai Slip* or *Mai Mĕluar* seem to be not infrequent, one woman that I met having been married to a Slim man (and divorced); and another having come from the Kerling tribe. Divorce seems to be fairly common, and I was told that in this respect men and women are on a footing of absolute equality, a permanent separation, with freedom to marry, taking place at the wish of either party. With the exception of theft serious crimes are rare, and Kanil, the headman of the settlement, said that even this was not punished, nor did it lead to blows among the parties concerned. If the owner of stolen property found another in possession of it, he would merely take it away, and upbraid the thief.

The dialect spoken by the Behrang *Sĕnoi* belongs to the Central Sakai group, but contains a fair number of Malay words. These may either have been taken directly from the local Malays, Sumatrans from various districts, who are, comparatively speaking, newcomers, or may have been introduced through contact with their neighbours, the *Mai Mĕluar* of Kerling.

The houses of the Behrang *Senoi* are little different from those of Malays and present no special features of interest. Their blow-pipes are of the Batang Padang type, with the exception that the mouthpieces, which are slightly hollowed at

the ends, are made of guttapercha instead of wood. All the dart-quivers that I saw were of the hard round-topped variety, which is found in the south of the Batang Padang district of Perak. One article of some interest that I purchased was a bamboo comb—an old specimen—which was decorated with very minute and finely-executed scratched-in patterns. The only other objects worth recording that I managed to buy were some ceremonial articles used by *Halaks* (Shamans). These I treat of below.

Beliefs and Customs connected with Agriculture

The Behrang *Sĕnoi* have a number of customs connected with agriculture, and I suspect that I have not by any means obtained all of them.

In clearing jungle for planting rice the brushwood is cut away before the large trees are felled. The Sakai, when beginning to make a new clearing, work for three days at cutting down the undergrowth, and then rest for a day. This is called *pahantak kĕrnor*; that is the cutting-of-brushwood tabu (*kĕrnor*, I am told, is equivalent to *tĕbas* in Malay). When the undergrowth has been disposed of the people set to work on the big trees and, after felling for three days, they take another day's rest for *pahantak gani*, or the felling tabu (*gani* has the same meaning as the Malay word *tĕbang*).

In sowing dry-growing rice the fourth day from commencement is a rest-day for *pañantak mĕnugal*[1] *bah*, the padi-sowing tabu.

At reaping, the rice-soul is taken on the first day, and consists of seven ears. The fourth day of reaping is a rest day, *bahantak kenod bah*, the tabu at the reaping of the rice. On this day things must not be carried down from the houses to the ground, though anything may be taken up into them. If an article were removed from a house, the rice-soul would follow it and be lost.

Customs and Beliefs with Regard to Storms.

The *Sĕnoi* of the Behrang Valley, like most, if not all, of the other wild tribes of the Malay Peninsula, are much afraid of thunder and lightning, and it is thought that should certain prohibited acts be done, without taking steps to avoid the consequences, the village of the offenders would be struck by lightning and destroyed. In a former number of this "Journal" I have given a list of some of the prohibitions which are in force among the Sakai of the Ulu Sungkai, and those that I was made acquainted with by Katil are somewhat similar. For instance, a monkey must not be dressed up and laughed at: a cat and a dog must not be set to fight; jungle leeches, *malau* (a kind of gum), lice, bugs, *jĕlotong*-wood,

[1] *Mĕnugal* is a Malay word.

ipar-wood (?), rattan canes of the species known as *kĕrai*, and two kinds of creepers (called *dagut* and *chinchong*), must not be burnt in the fire of the cooking-place. It is also forbidden to roast or boil the flesh of the *Bĕrok*, or of the *Kĕra*-monkey, at a fire on which dried fish has been cooked. In addition the notes of many kinds of birds and insects must not be imitated when heard, for instance that of the cicada. Even such actions as playing with the sand by the river-side and laughing loudly, as children like to do, or looking into another person's face and laughing, are, according to their ideas, capable of bringing on one of these disastrous storms.

Katil told me that a few months before my visit a man had cooked a piece of dried fish in the jungle, making his fire, without thinking about the matter, at the foot of a clump of rattan-palm of the kind known as *rotan kĕrai* (*Daemonorops geniculatus*). As a result of this, a violent thunder-storm came up before he had finished eating. On realizing what he had done, he took his working-knife and cut his foot with it (presumably with the intention of propitiating the Spirit of the Storm); then, on the blood gushing out, the storm stopped. He had only intended to make a superficial cut, but found that he had wounded himself so badly that he had to be carried home by his companions.

Thunder-storms caused by the infraction of one of these prohibitions are called *terlaik bŏk*[1] ("*Bĕrok* storms.")

In this connection, *chil'u*, which I understand from the Sakai of the Ulu Sungkai to be lightning, was said by Katil to mean "thunder storm," but this is not supported by the comparative vocabulary in Skeat's "Pagan Races" where *chilau*, cognate with *kilau* (Malay) "to glitter," is recorded as meaning lightning among the Sakai of the Korbu Valley. *Ungku* was given to me as the word for "thunder," and is not uncommon in various Sakai dialects. Ungku, Turul, or Nanchet, moreover, is the spirit who makes the thunder. His young brother, Bonsu, asked him to go with him to a place above the sky, but Turul (Ungku) would not consent, as he wished to remain below to cause trouble on earth. Bonsu thus left him below, where he remains till the present day. Turul has four children, three of them females. Wah Hilong, Wah Hideh, and Wah Dampeh; the fourth, Puntok Keboie, a male.

While I was with the *Senoi* I had an opportunity of seeing how they behave during a storm, for on two successive evenings there arose a high wind with distant thunder and lightning. On the first evening, while the wind was blowing in violent gusts, I heard the people in the next house calling out loudly, and I asked Katil, who was with me, what they were saying. I did not, however, go into the matter deeply then, as I thought that he might be reluctant to talk about the storm while it was still raging. On the second occasion most of the people of the settlement were in the hut in which

I was staying, when the wind came sweeping down from the hills. They were obviously rather frightened, and one old woman kept angrily shouting out orders to the storm to stop, not leaving off until it had almost done so. On that evening, and on the next morning, I got Katil to tell me a good deal about his people's ideas with regard to storms of wind.

It appears that the *Sĕnoi* think that during strong storms of this kind, the spirits of the old dead (*hemoit rah*), and the spirits of those who have died more recently (*hemoit pai*, "new ghosts"), are roaming over the earth.

The charms, if they may be called so, which the Sakai shouted out to compel the storm to cease were as follows:

1. "*Sidang!*"[1] a Perak Malay word meaning to "abate."
2. "*Kipas sa'blah!*" meaning "fan to one side" (Malay).

I was also told that the Behrang *Sĕnoi* frequently call out to the *buntal*-fish (a fish which is capable of distending its body) to suck up the storm ("*Isap buntal!*"), and that sometimes they cry, "*Wok mat! Wok lemoin!*" In this last I understand the meaning of the individual words, but I cannot attempt a translation. *Wok* means either "shadow" or "spirit," *mat* means "eyes," while *lemoin* is "teeth." As far as I could find out from Katil the expression is something to do with the belief that loud laughter will bring on a bad storm. I imagine that the charm is used for neutralizing the effect of previous laughter.

During very bad storms indeed the *Sĕnoi* assemble under their houses and burn *jadam* (extract of aloes?) and evil-smelling rubbish to scare away the storm.

Customs and Beliefs with Regard to Food.

Among the Senoi of the Ulu Behrang (as also among the Sakai of the Ulu Kinta) it is forbidden to mention the usual names of certain animals when their flesh is being eaten. Of the secondary, and almost invariably descriptive names, I give some examples below, together with their meanings.

English Name.	Ordinary *Sĕnoi* Name.	Name Applied to Animal when being Eaten.
1. Deer (*Cervus unicolor*)	... *Rusa* ...	*Leuk pos.*
2. Pig-tailed Macaque	... *Dŏkŭ* ...	1. *Leuk sabat.* 2. *Leuk karuk.*
3. Crab-eating Macaque	... *Rau* ...	*Leuk kempuk*

[1] In this sense it seems to be equivalent to the English slang phrase "shut up."

English Name.	Ordinary Senoi Name.	Name Applied to Animal when being Eaten.
4. Siamang (*Symphalangus syndactylus*)	... *Hūl* ...	*Leuk gantok.*
5. White-handed Gibbon (*Hylobates lar*)	... *Touh* ..	*Leuk gantok.*
6. Bear	... *Bĕrūok* ...	*Leuk tebul.*
7. Porcupine	... *Kūs* ...	1. *Leuk chenor.* 2. *Leuk pachor.*
8. Wild-pig	.. *Gau* ...	*Leuk teh.*
9. Benturong (*Arctictis binturong*)	*Tĕnyūk* ...	1. *Leuk senyūp.* 2. *Leuk bakok.*
10. Lotong (*Pithecus* sp.)	... *Bĕsīk* ...	*Leuk danum.*
11. Bamboo-rat	... *Lekat* ...	*Leuk tengkak*
12. Soft tortoise (*Trionyx*)	... *Pa-as* ...	*Leuk tehcu.*
13. Tortoise (the species which the Malays call *Baning*)	... *Sil* ...	*Leuk gersūk.*
14. Tortoise (the species which the Malays call *Kura*)	... *Kūrāk* ...	*Leuk hok.*

The following are the meanings of the various secondary names, so far as I could obtain them.

No. 1a. *Leuk pos.* *Leuk* in all these names, which I have translated "meat," signifies "animal food" (fish or flesh). It is exactly equivalent to, and obviously the same as, the Malay word *lauk*. The stag is called *leuk pos* (*i.e.* wind meat) because of its swiftness in running.

2a. *Leuk sabat* means *sabat* meat, the *sabat* being a spirit, inhabiting the bodies of some kind of animals. *Sabat* is, seemingly, comparable to the *badi* of the Malays.

The second name of the Pig-Tailed Macaque, *leuk karuk* (i.e. rotten-branch-meat) is due to its habit of breaking off, and throwing down, rotten branches. The Sakai told me that this was chiefly done in the early morning in the trees among which the monkeys had slept.

3a. *Leuk kembuk* ("lowland meat"?). I could not get an exact translation of the word *kembuk*, but it seems to refer to the fact that this species of monkey haunts the jungle of the lowlands.

4a. *Leuk gantok* ("hanging meat") from the habit.

5a. of these two species of hanging from branches by their hands.

6a. *Leuk tebul* ("*kĕlulut* meat"). This name denotes the fondness of the bear for robbing the nests of bees, especially of a small kind which the Malays call *kĕlulut*.

7a. *Leuk chenor* or *Leuk pachor* ("thorny meat"). Refers, of course, to the porcupines' spines.

8a. *Leuk teh* ("earth meat"). Refers to the wild pig's habit of routing up the soil in quest of edible roots, etc.

9a. *Leuk senyup* ("dark meat"). Refers to the Benturong's nocturnal habits. The second name, *Leuk bakok*, seems to have the same meaning.

10a. *Leuk danum*. I could get no proper translation of *danum*, but it seems to refer to the habit of individuals of this species of sleeping together in companies during moonlight nights—like fowls in a fowl-house, as the Sakai said.

11a. *Leuk tengkak* ("root meat"), the name being given owing to Bamboo-rats making their holes in the bases of clumps of bamboos.

12a. *Leuk teheu* ("water meat"). The soft-turtles live in ponds and rivers.

13a. *Leuk gersuk* ("stone meat"), because this species of tortoise may easily be mistaken for a stone if seen from a little distance.

14a. *Leuk hok* ("cocoanut-shell meat"), because the carapace looks like a cocoanut-shell.

The calling of any of these animals by their ordinary names while their flesh is being eaten will cause the offender to suffer from colic. I fancy, however, that the observance of these customs is becoming somewhat neglected by the *Sĕnoi* of the Behrang Valley.

Another belief with regard to food is that a man whose food is played with by someone else will suffer from colic (*vide* belief with regard to the *Baleh Busud*, *infra*, p. 204).

Katil told me that, among the Sakai of the Slim Valley women and children did not eat the heads of *Bĕrok* and *Kera* monkeys (*Macacus nemestrinus* and *M. cynomolgus*), because of the *sabat*[1] which resides above the eyes in these animals. Infraction of this rule, it was thought, would cause them to suffer from violent pains in the head, which might even be a cause of death. The custom is not observed on the Behrang River.

It is not allowable to cook turmeric with pig's flesh: the breaking of this rule will entail the transgressors falling ill with jaundice and fever.

[1] *Vide supra* p. 197

Animals shot with the blow-pipe must not be eaten with turmeric, or acid fruits; otherwise the poison used on the darts will prove ineffective when the people next go hunting.

Double bananas are not eaten by young women as it is thought that to do so would entail their giving birth to twins.

Various Beliefs.

Diseases are thought to be caused by spirits which come from the direction of the sea, and, in the case of epidemic disease, at any rate, the idea is partly supported by reason, since small-pox, one of the most dreaded disorders, reaches the Sakai through the Malays.

Spirits, of course, are, according to Sakai ideas, responsible for most of the misfortunes encountered by mankind: it is, therefore, necessary to avoid places which they are known to frequent. Thus, travellers in the jungle should not sleep for the night in passes between hills, these being spirit-paths.

When a child is born, the after-birth, with part of the navel-cord attached, is frequently hung on the branch of a tree, or on a bush. The Sakai say that within three days it becomes a scaly ant-eater, the navel-cord forming the tail.

The Behrang Sakai believe that the rainbow is the shadow that arises from the body of a great snake, which lives in the earth. The red of the rainbow is its body, the green its liver, and the yellow its stomach.

They say that tigers set snares for people in the jungle. If a man cuts through the spring-stick of one of these (probably some *liana*) he must not pass on by that path, or he will be caught in an invisible noose.

If blood is seen on leaves in the jungle it must not be touched, or the person who does so will be taken by a tiger.

A spirit is thought to exist, which the Sakai call the *Dana Sirlok* (*Dana* meaning "spirit" and *Sirlok* promise). This attacks persons to whom a promise has been made and broken. Thus, if a man has agreed with another to go on a journey, and subsequently leaves his friend in the lurch, the *Dana Sirlok* will accompany the traveller in his companion's place (being presumably at first invisible) and will attack and kill him in the shape of an elephant, a tiger, or a snake.

Katil was able to throw considerable light on a question with regard to Sakai beliefs which had been giving me trouble for some time. I have mentioned, in former papers on the aboriginal tribes, certain beliefs and customs in connexion with the word *punan*. I knew that there was a belief, common to both the Sakai, Sakai-Jakuns and many of the Malays, that a person going out into the jungle without having satisfied a desire for food, tobacco, or *sireh* would meet with some misfortune, but I had not been able to find out whether evil consequences could be ascribed to spirits. Katil, however, told

me that his people acknowledge a *Dana Punan* (Desire Spirit), who is responsible for ill luck met with by those who have given it an opportunity of causing them trouble.

The Giving of Names.

Children are given names as soon as, or soon after, they are born, but these are frequently changed. A child may be named from some event which happened at about the time of its birth, from the river near which it was born, from the settlement in which its parents were living, or from some peculiarity of person or habit.

One youth was named Jernang from the river near which he was born, but was more usually called Si Kork from a fanciful resemblance to a certain kind of bird, the *tentork; chĕchawe* of the Malays (the racquet-tailed drongo).

A baby girl was given the name of Tenyuk, because her parents were keeping a scaly ant-eater (*tenyuk*) as a pet at the time of her birth.

The father of this child, whose name was Sagap (meaning "ready)?" was so called because his birth was expected to occur some time before it actually took place, and thus everything was ready much before it was necessary.

A little girl was called Krek (cockle) because her chin was thought to resemble a cockle-shell in shape; another Puntok or Puntong ("burnt log") because she always liked playing about among the ashes of the cook-house fire.

Senoi Oaths.

Katil, the headman mentioned above, gave me the following example of a Senoi oath, which I believe that I have translated correctly.

"*Dideh*	*mat-jis*	*eng*	*sumpah.*		
"This	eye-day	I	swear,		
Kalau	*eng*	*pemohok*	*eng*	*chiloh*	*en*
If	I	lie	I	go down	into
teken,	*chak*	*bahayak;*	*eng*	*chib*	*darat*
water	eat	crocodile	I	go	land
chak	*keuk",*	*timpak*	*karuk!"*		
eat	tiger	hit by	rotten tree!"		

"This is the sun that I swear by. If I lie, may a crocodile eat me when I go down the river; and when I travel on land may a tiger eat me, or may I be struck by a falling tree!"

The Halak.

The *Halak* (Shaman) is found among the Behrang Sakai, as among other *Sĕnoi* tribes. Katil, who, shortly before our arrival, had been performing some magical rites for his

own benefit—he was suffering from a bad cough—told me, however, that he could not claim to be a true *Halak*, since he did not possess a *Gunik* (Familiar Spirit), but that he merely followed ancient custom in "playing" a little to try and cure his complaint. The rites had been carried out in a small one-roomed house, specially built for the purpose. The walls of this only reached half way up to the thatch, and a doorway at the back opened on to a small boat-shaped platform (*Balai lĕndut*), about eight feet long, and on a level with the floor of the house. This was supported on three trestles, made of six small trees felled at the roots and crossed in pairs below it. Their lower branches had been trimmed away, but their upper parts, still bearing branches, projected above the platform to a height of about seven or eight feet on either side. Two rails had been lashed to the trunks of the trees about three and a half feet above the flooring while a rattan cord girdled the trees near their tops, each extremity of it being attached to the end wall of the house. The branches of the trees, when the structure was first erected, had been covered with leaves, but, at the time of my visit the foliage had withered and fallen. A number of long water bamboos of large diameter, ornamented with wavy double lines running longitudinally, were placed at the far end of the platform, leaning against the rattan cord. Katil pointed out that one of these was longer than the others, having seven internodes, as compared with six. This long bamboo was used by the chief performer for ceremonial bathing; the others by the rest of the people. The bases of these bamboos were slightly ornamented with carving.

Hanging on the rails of the *Balai lĕndut*, and suspended from the roof within the house, were various ceremonial ornaments. Some of these were made from palm-leaves plaited into fanciful shapes, among them being decorations for which the Sakai gave me the following Malay names, *gĕlang giring*, *gĕlang rantai*, *burong dĕwak*, *tali dendan*, *tali liong*, and *tali sawit*. Other decorations of the same class for which I obtained Sakai names were *layang-layang hut* ("ascending swallows"); *layang layang chiloh* ("descending swallows"); *tuk keh-ep* ("centipedes' feet"); *semrong tumpi* (?), and *plek jeh-or* ("fruit of the cocoanut"). Two small pyramidal structures, made of *bĕrtam* pith, and of slightly different types were suspended inside the house. These, each of which had a doorway and model steps leading up to it, were called *balai sagi*; and *balai krauk* (*krauk* is equivalent to *kĕrawang* in Malay). The *balai sagi* was the most ornamental of the two and was crowned by a figure of a bird (*chiap cheralah*), model *tampoi* and *rambai* fruits (*plĕh tampoi* and *plĕh rambi*) and decorations called *sarak luie* (i.e. bees' nests). Other ceremonial objects were shaved sticks (*chendrok*), the shavings standing out from the stems in circles at short but regular intervals; hanging decorations called *patong salang*, made of two small pieces of thin board intersecting at right-angles; *patong gimbar*, hanging ornaments

made from four small pieces of board intersecting at right-angles so as to enclose a square, and having their ends projecting; two types of head-dress (*chungkute bulang* and *chengkul lepang*) made of leaves; two Halak's switches, one made of *lebak*-leaves (*s'lak selebok*), the other of leaves of the *bĕrtam* (*s'lak bertop*); and bands of tree-bark (*tempok luat*) with rough patterns drawn on them in yellow or black.

The Halak's *balai* (a circular frame of rattans with a thick fringe of finely shredded leaves depending from it), within which he chants his spells, was also hung from one of the beams of the "medicine"-house. This *balai* was in all essentials similar to that which I have already described and figured in a former paper on the Sakai of the Ulu Sungkai.[1]

Katil told me that among his people the Halaks performed by torch-light, while the Slim Valley Senoi held their performances in total darkness.[2]

He also said that the seances, which had taken place before our arrival, had been kept up for six consecutive nights, and that ceremonial bathing from the decorated water-bamboos (*kenas*) took place after the performances were finished, and shortly before daylight.

With regard to Sakai beliefs that *Halaks* become tigers, Katil told me that a *Halak's* ghost rose, usually on the fourteenth day after burial, and assumed that shape.

Burial and Existence after Death.

While living with the Senoi I had an opportunity of inspecting several graves, which were situated in the jungle at a little distance from the settlement, and at the base of a hill. None of these, which were close together, were very recent—the newest was, I believe, at least a couple of years old, probably more. Their sites were marked by narrow mounds, about as long as the bodies of those buried below. In two cases these mounds had undressed upright stones set up at the head and foot of them[3], one being covered, in addition, with water-worn stones from the river. Another grave had small *Sungkai*-trees planted round it, while in a fourth the mound had partly fallen into the burial-chamber below. Katil told me that slight huts of the lean-to type are erected over new graves, and that articles, such as adzes and blow-pipes, which must be either bent or broken, are placed within the hut. No remains of huts or offerings were, however, to be seen on the graves that he showed me, and he explained that they had rotted away.

[1] "Journal of the F.M.S. Museums," vol. VI, p. 98 & pl. xxvm.

[2] I have noted in the paper referred to above that the Sungkai people covered up a lamp that I took with me into the hut in which the *Halak* was about to perform.

[3] Probably in imitation of Malay custom.

Katil also said that food is placed at the foot of a grave morning and evening (sometimes only in the morning) for fourteen days after burial, the spirit of the dead man being thought to feed on what is put there for him.

On the fourteenth day the relatives of the deceased hold a feast, and (according to old custom—now, I understand, somewhat neglected) no ornaments should be worn or singing indulged in for two months after the death.

Katil's people do not bathe a corpse before burial, because, as he told me, his father's newly-dug grave was destroyed by a heavy rain-storm before the body was placed in it, this being ascribed to the fact that the corpse had been washed.

Graves are dug so that the head of the corpse points towards the east. The body is wrapped in mats or white cloth and placed face upwards.

Katil explained, by means of a plan scratched on the ground, that the grave is dug to nearly the required depth and the bottom then divided into two sections by a line running parallel to its sides. The left hand section (when looking towards the head of the grave) is next carried down to a sufficient depth, below the right hand, to receive the corpse. When the body has been placed in this deeper section, stakes are fixed slantwise across the bottom of the grave, their points being driven into the shallower (right hand) section, and their ends abutting against the side wall of the grave adjacent to the excavation in which the corpse lies. A covering of tree-bark, or of sheets of bamboo, is then placed over the stakes, the body thus being protected by a sloping roof. After this earth is piled up on the covering until the excavation is full, and the mound formed.

To turn now to *Semoi* ideas with regard to the soul and its survival after death. As far as I could ascertain from the Behrang Sakai, a man's soul and his shadow are regarded as one. The word *kemoit*, which I have mentioned above, seems to mean the ghost of a dead man, but the soul, or shadow, is referred to as *wok* or sometimes as *bayak* (*cf.* the Malay *bayang*, a shadow). The *wok* is said to leave a man's body during sleep, but does not usually go very far afield, in case it should not be able to return. The *kemoit*, as I have already stated, are supposed to be roaming the earth when violent winds are blowing. They are evilly disposed and hunt the souls (*wok*) of men, which take the forms of animals (often of the Muntjac). This is known because people in their dreams have seen the *kemoit* thus engaged. Those whose souls have been hunted fall sick.

The Sakai frequently speak of human beings as *mai pafat tujoh*, "people of the seven boards." It appears that the earth is thought to consist of seven layers or boards, while the region above the earth consists of six (*pafat an'm*), as does also that under the earth. Both the regions above and below the earth

are occupied by spirits who look like human beings. The *kemoit* (ghosts of the dead) live in the region above while, like men, some are blind and some are lame. Possibly they may also be thought to inhabit the underworld, but I omitted to make enquiry with regard to this point. The *mai papat tujoh* are said to be *beket* (hot) and therefore die: the *mai papat anam* are *senam* (cold) and do not die.

Another story makes the souls of the dead go to the Island of Fruits (*Pulau Bah*) where the *durian* and other fruit-trees are in bearing all the year round, and where men, when they are old, again become children, and again grow up. I am, however, rather inclined to think that this legend may have been borrowed from tribes further to the south.

The Behrang Sakai believe in grave-ghosts, *Dana Kubor* (equivalent to the Malay *Hantu Kubor*) besides the *Kemoit*.

It used to be customary to desert a settlement when a death occurred, but Katil told me that this is now not usual. The reason given for the desertion was that the survivors thought, since one of their relations had died there, that the locality must be haunted by spirits. Katil made it plain that they were not frightened of the ghost of a friend, but of the evil spirits which had attacked him (or her) and caused his last illness.

A curious little story having some reference to death is given below. It was told me by Katil.

"When anyone dies, the people of settlements distant from the place sometimes get to know of the death in this way.

Two spirits, which are known as *Baleh Busud* (Virgins of the "Ant"-hill) and look like little girls, sit on a "male"[1] nest of the termite. One of them is heard to laugh as she rolls the dead man's skull down to the mound, and the other says to her, "*Leuk jik, jangan chikak*" ("Don't "colic" my food!").

Folk-Tales.

The Behrang Sakai have a large number of folk-stories, of which I obtained several. Two of these I give below. I have chosen those which seemed to me most likely to be truly indigenous, and not borrowed from the Malays.

Folk-stories, Katil informed me, should be told at night, as this brings good luck in hunting animals in the jungle. A man who told folk-stories during the day-time would, he said, hurt his foot against a stump. I gathered, however, that this latter was a popular saying rather than a strong belief. It may be remarked that it is always the youngest-born son (Bonsu) who is the clever man in these *Senoi* tales.

[1] The "male" nests are those which are long and pointed

The Cockroaches' Village.

Told by Katil.

There was once a man who had seven male children. Their names were Sulong, Tengah, Alang, Ruh, Penangkap, Bumbun, and Bonsu Api.

One day the eldest son (Sulong) went off into the forest to hunt for game, and far away from his home came upon an *ara*-tree (*Ficus* sp.) in fruit. He sought out a convenient place at some distance from the tree to make a shelter for the night, and there he slept.

Early in the morning he went to the tree and climbed up into it with his blow-pipe to shoot the monkeys, birds and squirrels, which came in hundreds to eat the fruit.

The tree was on the top of a hill, and below the hill, on one side, though hidden from view, was a clearing. While he was in the tree he heard people laughing and the cries of children coming from the clearing. So he came down from the tree and, making his way towards the sounds, eventually arrived there. He entered a patch of sugar-cane and came across a fowl which cackled loudly. Next he came to a house and saw a mortar in which he had heard somebody pounding padi. Then he called aloud, "Hoi, sister! Hoi, sister!" but nobody answered, and going up into the house he found that the people had vanished. He saw food ready cooked there and said to himself, "What am I to do, for I am hungry? If this is spirits' food it will be savourless, but if for human beings, it will be salt."

So he tasted the food and found that it was salt and, thinking it safe to do so, ate until he was satisfied. After this he took water and drank it, and then he took *sireh*, which was also set out there, to chew. Now the first quid that he chewed tasted sweet, the second rich, the third intoxicating, and the fourth sweet. Then feeling giddy, he lay down on some mats which were spread in the house. When he had fallen into a stupified sleep, the people of the house, who were all women, but who had become cockroaches at his approach, came out of their lurking places and ate his body till little remained to him but his life. At last, on his awaking, they killed him with billets of wood.

Now, as he did not come home, the second brother set out to look for him and came across the hut in which he had spent the night. Here he slept, and in the morning he went to the *ara*-tree where, on the previous evening, he had found his brother's blow-pipe, dart-quiver, and spear, together with the rotting bodies of the animals that he had shot. He also climbed up into the tree and shot some of the animals and birds which were eating its fruit, and towards mid-day, while still in the tree, he heard the sound of people pounding rice and of laughter coming from the place where the clearing was

situated. So he said to himself, "Perhaps that is where my brother went." Then he climbed down from the tree, and, heaping together the bodies of the beasts that he had shot, he left them there with his blow-pipe and chopper and went in the direction of the sounds. When he got to the patch of sugar-cane the hen cackled loudly (and, as before, the people of the house became cockroaches and hid themselves). He, too, on coming to the open space in front of the house called out, "Hoi, people! Hoi, sister!" but nobody answered him.

So he went up into the house and found no one there, but food and *sireh* set out ready. He waited for some time, but as nobody came, and he felt hungry, at last he said, "If this is the spirits' food it will be savourless, but if for human beings it will be salt." Then he tasted the food, and finding it salt, ate his fill. Next he drank water and after this he took *sireh* and chewed it. The first quid that he chewed tasted sweet, the second rich, the third intoxicating and the fourth sweet. And he also felt dizzy and went to sleep. Upon this the cockroaches came out and ate him up; and they hid his bones under a big cauldron, where they had also hidden those of his brother.

Now when he did not come home either, the third brother took up the search, and met with the same fate, as did also the fourth, fifth and six.

At last the youngest brother, Bonsu Api, said to himself, "How is it that my brothers do not come home?"

That night his grandfather came to him in a dream, and he asked him how it was that his brothers had not returned, and where they had gone to.

The grandfather replied that they had not come home because they had been killed by the Cockroach Demons (*Rengkasi*[1] *Lipas*).

"What am I to do about them," said Bonsu Api, "and how am I to kill them?" "You must give *chĕnduai*[2] to them," said his grandfather.

Then Bonsu Api awoke and, remembering his dream, he thought that he also would follow his brothers. So he told his father and mother of his desire and, having made his preparations, on the next morning he set out.

He, too, came to the hut where his brothers had slept and found the fruit-tree, where they had left their blow-pipes and quivers; and the heap of rotting game under the tree was as big as a large ant's-nest, and the quivers and blow-pipes, which had been left there by the brothers who had preceded him, were already partly destroyed by "white-ant."

Then he thought of what his grandfather had said to him in his dream. So he also climbed up into the tree and shot the

1 *Rengkasi* the Malay *Gerga*.

2 A herb from which the Sakai make love-charms.

birds and animals that were feeding on the fruit. After a while he, too, heard voices from the clearing, and, coming down from the tree, noticed that the track made by his brothers led in the direction whence the sounds arose. Now when he neared the clearing, he lit a cigarette into which he had put *chĕnduai*, and observing from where the wind was blowing, found that it was from him and towards the clearing. Then he went carefully in that direction and came to the house, where he heard the people complaining and saying that they could not keep awake, for they were made sleepy by the fumes of the *chĕnduai* that he kept blowing towards them as he smoked his cigarette.

Then each woman in the house left her work and fell asleep. So Bonsu Api went up into the house, and saw the floor covered with women lying there; for they had not had time to become cockroaches before they were overwhelmed by the fumes of the *chĕnduai*.

So he went through all the rooms and at last, in the upper storey, he found a beautiful princess, who was awake, since the *chĕnduai* fumes had not reached her. Then he threatened to kill her, but she besought him to relent, asking him why he should wish to do so. Thereupon he told her that her followers had killed his brothers, and she replied that, if it were true, she knew nothing of it, for she seldom left her room.

So he pardoned her on condition that she should find out what had been done with the bodies of his brothers: but the people below slept on and could not be wakened. However, the princess at last found the bones of the six brothers below the cauldron. Then Bonsu Api took the bones and heaped them together in front of the house. And he told the princess to follow him, saying that he would kill her if she did not. So she consented, and made ready for the journey. Now when she had come down from the house, Bonsu Api shut the door and set fire to the walls and roof, so that all the people inside began to be burnt. And Bonsu Api spoke to them and said, "If you wish to live, become cockroaches for ever, not sometimes cockroaches and sometimes human beings; and in future eat the fragments of food that are left by mankind." So they became cockroaches.

As for Bonsu Api he brought his brothers to life again and went home, taking them and his princess with him.

Bonsu and Tak Kemoit.[1]

Told by Kahil.

A youth named Bonsu (youngest born) was once wandering in the jungle. He came from the going down of the sun, the Island of Fruits (*Pulau Buah*). As he was journeying he came to a tampoi-tree on which the fruits were light coloured and unripe. He took off his dart quiver and his chopper, and

[1] *Tak kemoit*, green (unripe) fruit.

putting them and his blow-pipe down against the tree, went to sleep.

He slept on and on, until the fruit of the tree was ripe, and at last a single fruit fell on his chest and awoke him with a start. So seeing that the fruit had ripened, he climbed up into the tree and ate a little of it. Then he called aloud, saying, "If there is anyone in this country let him come and eat fruit." But nobody answered him. He ate some more fruit, and again called out as before, and this time he heard a voice answering him from the direction of the going down of the sun, "Where are you, grandchild?" "Here I am, grandfather," said he. Thus they kept on calling and answering one another until the new-comer was close at hand. Then Bonsu saw that the stranger was an old man with red and deeply sunken eyes.

Now the old man began to eat the fruit, swallowing it branches, leaves and all; and when he had satisfied his hunger he said to the youth, "Your grandfather wishes to relieve himself." Then Bonsu replied, "If grandfather wishes to relieve himself, let him go far away down-stream." So the old man started off, and after a while he called out, "Where shall I relieve myself?" and Bonsu answered, "Far away down-stream." In a little while he called again, asking the same question, and Bonsu answered him as before; for he was frightened that the old man would eat him, having seen how he had swallowed the fruit, branches, leaves and all. Thus they went on calling and answering until neither could hear the other.

Then Bonsu came down from the tree and ran away till he saw a plain by the edge of the sea, where a *pinang dara*[1] and a *birah*-plant[2] were growing side by side near the shore. When he reached them he called to him wild pigs, woodpeckers, and porcupines, and they came. So he told them that, if the old man, the Red-Eyed Spirit, came to the place and climbed up into the *birah*-plant to follow him, they were to wait until it had grown up to the sky, and were then to cut it down. This they promised to do. Then Bonsu climbed into the *pinang*-tree and sang,

> "*Tinggi, tinggi batang pinang!*
> *Tinggi rendah puyoh Mĕlaka!*
> *Aku takut Hantu Merah Mata!*"[3]

and the *pinang*-tree immediately grew up into the clouds carrying him with it.

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[1] A betel-nut palm which has not yet born fruit.

[2] A kind of aroid?

[3] A Malay verse (*pantun*)

> High, high is the *pinang* trunk!
> Tall and stumpy are the quails of Malacca.
> I'm frightened of the Red-Eyed Spirit!

Not long afterwards the *Hantu Merah Mata* came to the spot and, seeing that Bonsu had gone up to the clouds on the *pinang*-tree, climbed into the *birah*-plant and chanted,

"*Tinggi, tinggi batang birah!*
Tinggi rēndah puyoh Mēlaka!
Aku takut Hantu Merah Mata!"

and the *birah*-plant immediately grew upwards, carrying the Red-Eyed Spirit with it. But the Red-Eyed Spirit could not catch Bonsu because he had reached the sky.

Then Bonsu called out, "Ancestor, open the door!" So his ancestor[1] opened the door, and he went in and shut it again. Upon this the pigs, the woodpeckers, and the porcupines cut away the stem of the *birah*-plant so that it fell into the sea carrying the Red-Eyed Spirit with it; and he was drowned.

[1] This is Ungku (Turul) who governs thunder and lightning. Bonsu of this story is not, of course, Ungku's brother of the same name.

XXIII. ETHNOLOGICAL MISCELLANEA.

By Ivor H. N. Evans, *Assistant Curator and Ethnographical Assistant, Federated Malay States Museums.*

Setting up the Posts of a Malay House.

While staying at Pianggu on the Endau River in 1917 I was lucky enough to be present at the ceremony of setting up the posts of a Malay house. When I arrived on the site of the new dwelling the holes for receiving the posts had been already dug and the posts themselves, conveniently disposed, were lying in pairs, with cross-beams attached, ready to be set up. The proceedings were begun by a broken fragment of a small silver coin, wrapped in white cloth, and a large piece of *kundor* —a kind of gourd—being thrown into each hole.

Ceremonial bands of plaited coconut (?) leaves—called *jari lipan* (centipedes' feet) from their shape—to which were attached little square closed-in plaited boxes of the same material (*kĕtupat*) filled with rice, were then bound round each post in about the middle.

After an orthodox Mohamadan prayer had been said by a *Lĕbai*, and incense burnt, the men who had come to help in erecting the house partook of a meal of glutinous rice dyed with turmeric (*pulut kunyet*), parched rice (*bĕrtis*), bananas, and *pulut* (*Oriza glutinosa*) wrapped in leaves, which was served to them on the recumbent posts. When they had finished eating, a man, who had been chosen by the *Pawang* as his assistant, brought water and poured it along each of the posts, walking clockwise round the house-site. After him came the *Pawang* with a sprinkler made of the leaves of several kinds of plants[1] in his right hand, and a brass bowl of ceremonial rice-flour mixed with water (*tĕpong tawar*) in his left. He, having murmured a charm at the post from which he started, sprinkled the *tĕpong tawar* along the posts, and into the holes which were to receive them.

After the *Pawang* had performed this rite the workmen gathered together to raise the first pair of posts with their connecting cross-bar, this being done with loud shouts of *Mohamad rasul' Allah*, the officiating *lĕbai* reciting a prayer meanwhile. The rest of the posts were then similarly erected, and the ceremony was at an end.

On meeting the *Pawang* subsequently, I asked him to tell me the charm that he had said over the first post, when about to sprinkle it with *tĕpong tawar;* and he gave me the two

[1] *Ribu ribu* (*Lygodium scandens*), *gandarusa* (*Justicia gandarusa*), *jĕnjuang* (?) and *sapuleh* (?).

following verses, which wish prosperity to the new house and its inhabitants:—

Tēpong tawar, tēpong jati;
Tēpong awal mula mĕnjadi.
Dapat mas bĕrkati-kati,
Lagi hidup, sampai ka-mati.
Tēpong tawar, tēpong jati.
Surok batang mali-mali.
Sa-lengkar daun pēgaga.
Salamat ambil-lah galah.
Minta dayang sini.
Salamat puji bagi Allah.

Why the Bear has no Tail [1]

(A folk-tale of the Pahang Malays obtained near Kuala Krau.)

A very thin buffalo was once feeding in a meadow. To him came a tiger, and said, "I am going to eat you." The buffalo, however, besought the tiger to wait for seven days, "for," said he, "I am very thin, and if you wait for seven days, I shall have an opportunity of growing fat." To this the tiger agreed.

Now on the morning of the seventh day the buffalo was wandering disconsolately along, when a crippled monkey, who was sitting in a tree, called to him and asked him why he looked so sad. So the buffalo related how he had promised to meet a tiger, who wished to eat him.

"Very well, I will see if I can't help you," said the monkey, "but you must carry me on your back."

Thus they started in search of the tiger, with the monkey sitting on the buffalo's back; and before very long they met him.

Now as soon as the monkey saw the tiger, he began to munch two brinjals, which he had brought with him, exclaiming loudly as he did so, "My word, this tiger's head tastes good!"

The tiger, who heard what the monkey said, became frightened, and ran away as fast as he could. While he was still running, he came upon a bear, and told him about the monkey that ate tigers' heads.

Then he tried to persuade the bear to go and investigate the matter, but the bear replied that it was not his affair; still, if the tiger wished it, they would go together. Then, as each

[1] A variant of this story, translated by Mr. G. M. Laidlaw, in which the mouse-deer plays the parts of both the buffalo and the monkey, is to be found in the *J. R. A. S., S. B.*, No 48, pp. 86-87.

was afraid that the other would run away, it was agreed that they should tie their tails together.

[At this time the bear had a fairly long tail, and the tiger's was shorter than it is now.]

So they tied their tails together and set out, and, after a little, they came to the place where the buffalo was waiting, and saw the monkey still crunching up the "tiger's head." Thereupon, being frightened, they both tried to escape, forgetting that their tails were tied together.

At length as they struggled one against the other, the bear's tail broke off short, and they both ran away.

The next time the tiger met the bear, he said, "Your loss is my gain; for you have lost your tail while mine has become longer."

And that is the reason why, to the present day, the bear has only a stump of a tail.

Budak Yoid Intoie.

A folk-story obtained from the Sĕnoi of the Behrang Valley.

[*The Sakai who told me this story declared that it had been handed down among his people for generations. There seems to me, however, to be good reason for thinking that, at any rate, parts of it must have been adopted from the Malays, or, if the story is really old, from some fairly civilised people with whom the Sakai were in contact before the time of the invasion of the Peninsula by Malays. I. H. N. E.*]

There was once a youth called Budak Yoid Intoie (Big Knife Youth) who was the youngest of seven brothers. His six elder brothers were famous smiths, and one day, when they had finished work, Budak Yoid Intoie asked them for some iron in order to try his hand, but his brothers refused to give him any. So he said to them, "How am I to learn, if you won't give me any iron?" Then he collected the odds and ends and scales of iron that they had left, beat them out into a huge knife as large as a *birah* leaf, and made a handle for it as large as the bole of a cocoanut-tree.

When it was finished he said to his father and mother and his brothers, "I am going on a journey." So he made ready, but before starting he planted a certain kind of flowering shrub, with a single blossom upon it, in the level space in front of the house, saying to his mother, and to his brothers, "See, O mother, see, you, my brothers, this shrub of mine! If the blossom on it withers entirely I shall be

dead, but if it shuts and then opens again, I shall still be alive."

Then he set out, taking his knife with him, and made his way through the jungle, cutting down as he went the big and small trees that stood in the path. And the sound of the great trees being cut and falling was, "*Prung punggau, prung punggau, prung punggau.*" Now a man who happened to be walking towards him, hearing the noise of the trees falling, and being frightened that one of them might kill him, began to call out, "*Ai! Ai! Ai!*, I am coming towards you and shall be struck by a tree!" "What is your name?" said Budak Yoid Intoie and the newcomer replied, "My name is Rah Serpik[1] (Pull-the-Canes)." Then answered Budak Yoid Intoie, "If your name is Pull-the-Canes, well, pull the canes!" So Rah Serpik pulled the canes out with one hand. "Well," said Budak Yoid Intoie, "if you can do that, you are rightly named Rah Serpik." So they stopped to chew betel-nut, and Rah Serpik asked his companion what his name was, to which he mâde reply, "Budak Yoid Intoie" (Big Knife Youth). "Why, if that is so," said Rah Serpik, "where's your knife?" "I don't know," said Budak Yoid Intoie, "I have not got it, it's only my name." Now he had hidden his knife in a large tree.

He, in his turn, asked Rah Serpik if he had a knife, and Rah Serpik replied, "If I carried a knife my name would not be Pull-the-Canes." Then he again asked Budak Yoid Intoie for a knife, as he wanted to cut up the betel-nut, and Budak Yoid Intoie said, "I have put it into the big tree over there. If you can lift it, I will become your follower, but, if you cannot, you shall become mine."

So Rah Serpik went to get the knife, but was unable to raise it, and Budak Yoid Intoie said, "Very well, you shall be my follower."

Then he got up and fetched it himself, and they chewed betel-nut, and, when they had finished, set out on their journey together, Rah Serpik following Budak Yoid Intoie, while Budak Yoid Intoie cut down the trees that stood in the way, *toalang*-trees, *kĕmpas*-trees, *mĕrbau*-trees, *mĕranti*-trees, or whatever they were, "*Prung punggau, prung punggau, prung punggau.*"

Soon another man cried out from in front of them, "*Ai! Ai! Ai!*" just as Rah Serpik had done before. So Budak Yoid Intoie called the newcomer to him and asked him his name, and he replied, "Tinju Tebik[n] (Thump-the-Banks)." Then said Budak Yoid Intoie, "Well, if your name is "Thump-the-Banks," just thump the banks of this river!" So Tinju Tebik[n] thumped the banks of the river with his fist, and they fell down and blocked the stream.

[1] *Rumun manau* in Malay. *Rotan manau* is a very useful kind of rattan cane which is collected by the Sakai for sale to the Chinese.

Then Tinju Tebik[n] asked Budak Yoid Intoie his name and he told him. "If that is your name," said Tinju Tebik[n], "where is your knife?" "I don't know," replied Yoid Intoie.

So they sat down to chew betel-nut and Budak Yoid Intoie asked Tinju Tebik[n] if he had a knife to cut the nut into pieces with, but Tinju Tebik[n] answered, "If I had a knife, my name would not be Thump-the-Banks." After a little Tinju Tebik[n] asked Budak Yoid Intoie if he had not got a knife and Budak Yoid Intoie told him where it was hidden, making him promise, just as he had done with Rah Serpik, to become his follower, if he could not lift it. But Tinju Tebik[n] was not able to raise the knife any more than Rah Serpik, and Budak Yoid Intoie went and got it himself.

When they had finished chewing their betel-nut, they set out again, Budak Yoid Intoie being in front, with Rah Serpik and Tinju Tebik[n] following him; and the sound of the trees being cut and falling before Budak Yoid Intoie was, "*Prung punggau, prung punggau, prung punggau.*"

After a little time someone cried out from in front as before, and again Budak Yoid Intoie called the newcomer to him. "What is your name?" said Budak Yoid Intoie, and the stranger replied, "Lingkong Benua (Push-the-Country-Round)." "Oh," said Budak Yoid Intoie, "if your name is Push-the Country-Round, well, just push the country round!" So Lingkong Benua pushed the country round, till its backbone was broken: and Budak Yoid Intoie said to him, "Your name is rightly Lingkong Benua."

So they sat down to chew betel-nut and Lingkong Benua asked Budak Yoid Intoie for his knife, and was not able to lift it any more than Rah Serpik or Tinju Tebik[n] had been able to do.

After a while they continued their journey, and at last they came to the sea and wished to cross it: and Budak Yoid Intoie said to his companions, "Wait here, while I go and search for a bridge." So he searched, but could not find any. Then he took his knife and said to it, "*Tohoit yang sah! Eng sindrang sah! Eng saihih! Eng putau! Eng nujum! Eng blian! Yoid eng jadi papat*[1]," and the knife in its sheath became a bridge on which they could cross the sea. But a large dragon came up from below and waited under the bridge.

Then they went across, Budak Yoid Intoie's companions being in front of him; and when they came to the other side, Budak Yoid Intoie drew his knife from its sheath and cut off the dragon's head: and it floated away until it came to a Raja's bathing-place, and there it remained.

[1] I could not get a true translation of some of this charm. "*Tohoit yang sah*" seems to be an invocation of some kind. *Eng sindrang* (I luck-bringing) ..... *Eng nujum* (I astrologer). *Eng blian* (I were-tiger). *Yoid eng jadi papat* (Knife I become plank).

Now the Raja complained because the head was rotting and polluting the river, and ordered all his followers, from the mouth of the river to its source, to come together and remove the dragon's head; and they came together.

Meanwhile Budak Yoid Intoie and his companions went on their way until they came to a house, the owner of which was an old man named Tak Tempait Bungah (Grandfather Patterned Jar).

Tak Tempait Bungah asked them whence they came and they replied "from the neighbouring country." Then they climbed up into the house, which was situated up-stream from the Raja's palace, and there they stayed.

Now the Raja had given it out that whoever could remove the dragon's head should marry his daughter, who was shut in an upper room, and enclosed by a seven-fold fence of ivory; but nobody could do it, for the dragon's head was as big as a mountain.

One night Budak Yoid Intoie asked Tak Tempait Bungah what was the trouble from which the Raja wished to be set free, and Tak Tempait Bungah told him how the dragon's head had stranded at the Raja's bathing-place.

Some nights afterwards a follower of the Raja's came to the house, and Budak Yoid Intoie said in his hearing, "Why, if I only pushed the dragon's head with my finger, I could remove it."

When the Raja's follower got home, he told the Raja that he had met four men at Tak Tempait Bungah's house, one of whom said that he could remove the dragon's head with a finger. So the Raja ordered the four men to be called, and when the messenger told Budak Yoid Intoie the Raja's order, he said, "How can we go to the Raja's palace in these clothes, which are all covered with mud?"

The messenger returned to the Raja and told him what Budak Yoid Intoie had said; and he thereupon sent clothes and everything necessary to Budak Yoid Intoie.

So Budak Yoid Intoie set out, leaving his companions behind him, and, when he arrived at the palace, the Raja gave him food and betel-nut.

When he had fed, the Raja asked him from where he came, and he replied that he came from the country across the sea, and asked why he had been sent for. Thereupon the Raja told Budak Yoid Intoie how he had heard that he (Budak Yoid Intoie) could remove the dragon's head with one finger, and promised him, that, if he could do so, he should have his daughter in marriage.

Now Budak Yoid Intoie went alone to the river to see the dragon's head, and gave it a slight push, which sent it floating

down stream; then he returned to the house where he was staying, without the Raja knowing about it.

After a time some of the Raja's people came down to the river and found that the dragon's head was gone; and, when the Raja was informed of this, he called Budak Yoid Intoie to his palace and wished to give his daughter to him in marriage; but Budak Yoid Intoie excused himself, saying that he wished to travel more and see other countries before he married. So Budak Yoid Intoie gave the Raja's daughter to Rah Serpik as wife.

Now the Raja's daughter was betrothed to Bonsu Jangkah Benua,[1] the son of another Raja, and was to have married him in three months.

One day Bonsu Jangkah Benua drew his sword, the blade of which was as large as a banana leaf, and the hilt like the bole of a coconut-tree, and said, "Why, the rust on my sword-blade is like a "male" ants'-nest[2]; perhaps someone has married my betrothed."

Then he got ready his ship, loaded it with weapons of all kinds, and set sail.

When the Raja saw Bonsu Jangkah Benua's ship approaching he thought to himself, "Perhaps this is my daughter's betrothed." And Budak Yoid Intoie and his four companions were in the palace at the time.

As soon as the ship came to land Bonsu Jangkah Benua went straight to the Raja's palace and called from below the steps, "Whoever has taken my betrothed, come down!"

Now when the Raja had heard the music of the gongs and the flutes coming from Bonsu Jangkah Benua's ship, as it approached, and the noise of the cannon being fired, he had run away into an inner room and had hidden his head in a single-ended drum.

Budak Yoid Intoie heard Bonsu Jangkah Benua below the steps and he called to him to come up into the palace to chew betel-nut, acknowledging that there had been a fault in the matter of the princess marrying. But Bonsu Jangkah Benua refused to chew betel-nut with him, and said that he would cut in two the man who had stolen his betrothed.

Then Budak Yoid Intoie took a censer and burnt incense, saying, "*Chiloh tak pedah eng mav s'lah*
come down ancestor sword I size leaf
bah."
rice

Whereupon the sword came down from the sky and it was of the size of a rice-leaf. And he told Bonsu Jangkah Benua to return to his ship, but he refused.

[1] Youngest-Son-Strides-Over-Country (?)

[2] Tall and pointed nests of the termite are called male nests

So Budak Yoid Intoie came down from the house, and when he had reached the lowest step Bonsu Jangkah Benua aimed a blow at him with his sword; but Budak Yoid Intoie leapt aside, and Jangkah Benua's sword cut the step in two. Thus they fought, but Budak Yoid Intoie did not attack and avoided the blows of Jangkah Benua's sword; when he smote low, jumping high; when he smote high, bending low.

At last Budak Yoid Intoie leant against a tree, and Jangkah Benua stabbed at him and broke his sword in the tree as Budak Yoid Intoie jumped aside. Next he took a *kĕris*, and that also broke against a tree; and then in turn a *sundang*, a *lamang*, a *tumbok lada*, a *golok*, a *badek*[1], and a gun, but each in turn became useless.

Then he took a cannon and fired at Budak Yoid Intoie for seven days and seven nights, so that the village and everything in it was destroyed.

After this Bonsu Jangkah Benua had no more weapons left, and the fight stopped. Budak Yoid Intoie up till this time having made no attack.

Then Budak Yoid Intoie began to dance the war dance (Malay, *gayong*), and made a feint at Jangkah Benua; but the latter taunted him, asking him how he expected to kill a man with a sword the size of a rice-leaf. Again Budak Yoid Intoie made a feint at Jangkah Benua, and again Jangkah Benua taunted him. Then said Budak Yoid Intoie, "I have made two feints at you, if I make another just see if you don't remember it!" and he made another feint at him from far off. But Jangkah Benua continued to jeer at him, saying, "You fool, how can you expect to reach me with your sword from such a distance!" "If you don't believe that I have touched you," said Budak Yoid Intoie, "just bow your head," and on Jangkah Benua's doing so, his head fell off, and he died.

Then Budak Yoid Intoie collected all Jangkah Benua's weapons, and those which were bent became straight, and those which were broken became whole.

Next he brought Jangkah Benua to life again, and gave him back his weapons, and sent him away in his ship.

[*Budak Yoid Intoie then goes through exactly similar adventures at the courts of two other Rajas to whose bathing-places the dragon's head drifts, and marries his two remaining followers to their daughters; just as he married Rah Serpik to that of the first Raja.*]

[1] Different kinds of swords, knives, and daggers.

Now after the last of his three followers (Lingkong Benua) had been married, Budak Yoid Intoie planted a shrub, bearing a single blossom, in the open space in front of each of their houses, just as he had done in front of his father's house before he set out on his journey; and, telling them that he wished to travel again, explained how, if he died, the flowers would wither.

Then he set out towards the open sea, and at last he came to a city called Bandar Benua, which lay close to the shore: but he found no people dwelling there; not even any animals.

At length he came to the Raja's palace and, going up into it he called aloud three times, but nobody answered him.

So he searched the house and at last he came across a single-ended drum, and, on his sitting down to beat it, heard someone calling from inside it. Then the person in the drum came out, and he found that it was a beautiful princess: and she told him how the country had been laid waste by an enormous twice seven-headed Roc[1] which came every evening from the *Pauh Janggi*,[2] that grew on the shore near the palace.

Then the princess gave him food, but towards evening she hid herself in the drum again, and Budak Yoid Intoie went out on to a platform in front of the palace and burnt incense, calling to his ancestor to let down his sword from the sky, for it had vanished after each of the fights with the three Rajas' sons. Upon this the sword came down to him, and it was not long before the Roc came and perched on the *Pauh Janggi*; and every head croaked, "*Laur! Laur! Laur!*"

Then Budak Yoid Intoie cut off the heads of the Roc, till only one remained, and when he cut off this as well, the Roc fell forward, dead, pinning him under one of its wings.

Now at about this time Budak Yoid Intoie's followers observed that the flowers on the shrubs that he had planted, had withered. So they set out to search for him, and at last they came to Bandar Benua, and there they met the princess, who told them how Budak Yoid Intoie had been pinned beneath the Roc for seven days and seven nights. Then they cut away the Roc's body and released him.

So Budak Yoid Intoie married the princess and lived at Bandar Benua, but his companions returned to their homes.

Notes on Malay Beliefs and Customs (II).

If you go to bed with a grain of rice sticking to your clothes or your body, you will dream that a tiger is hunting you. (From a Malay of Kampong Linggi, Negri Sembilan).

[1] The Sakai name for this bird is *Pangei*: the Malay name *Garuda*.

[2] The *Pauh Janggi*: a tree believed by the Malays to grow on a sunken bank in the centre of the ocean (Wilkinson's Dictionary).

Filings from a porcupine's tooth, if drunk in water, are a remedy for poison taken internally. (From a Malay of Kuala Krau, Pahang).

When women go down to the river to get water for use in *bĕrhantu* ceremonies (spiritualistic *séances*) held for the benefit of sick persons, they must not speak to anyone while carrying it. Furthermore, they must cover the mouths of the vessels with leaves when full, and, in filling them, must let the water trickle in slowly, and not allow it to enter with a gurgling sound. (From a Malay of Pulau Tawar, Pahang. My informant, seeing a woman on the banks of the Pahang River carrying up a water-pot whose mouth was covered with leaves, gave me this note).

If you are afraid that some mischance will befall you because you have left your village without satisfying a craving for tobacco or food,[1] put the third finger of your right hand into your mouth, and suck it three or four times. You will thus avert misfortune. (From a Malay of Pulau Tawar, Pahang).

There is a deep, round depression near the Pahang River not far from Jerantut, but on the opposite bank, which is called Leboh Chupak. It is said that a village once stood on this site, but was overwhelmed by a storm, and swallowed up by subsidence of the ground, because a man placed two half coconut-shells—*chupak* measures—like caps on the head of a dog and a cat, and laughed at them in company with other villagers.[2] (From a Malay of Pulau Tawar, Pahang).

To bring rain the cooking-pots and their cane stands must be washed, and a cat given a bath[3]. (From a Malay of Kampong Linggi, Negri Sembilan).

Scrapings of an incisor tooth of a bamboo-rat if applied to wounds in the feet caused by bamboo-stumps will effect a speedy cure. (From a Malay of Kampong Perak, near Batu Kurau, Perak).

Wood must not be chopped on the threshold of a house, or the owner will be bitten by a snake or centipede when he goes to the jungle. (From a Malay of Kampong Perak, Batu Kurau, Perak, whom I heard rebuking his wife for thus chopping firewood).

Nobody should lie with legs sprawled out of a doorway, or a tiger will come to the village. (From the same Malay as

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1 *Yakut kĕna kĕmpunan.*

2 I have obtained stories of the dreadful fate which overtakes those who dress up animals and laugh at them, from Sakai in several districts, but this is the first time that I have heard of such a belief among the Malays. The word used in the neighbourhood of Pulau Tawar for a bad storm followed by a subsidence of the ground is *kĕlĕboh*, *leboh* seemingly being the name given to places where such subsidence is thought to have occurred. *Chilau*, a term frequently used by Sakai (when speaking Malay) to describe these storms caused by impious actions, has a very similar meaning. *Leboh* is a local variant of the ordinary Malay word *lebor*, which means "smelting," "liquefaction," or "destruction."

3 *Mandikan pĕrĕsh, mandikan kĕkay, mandikan kuching.*

the above, who had occasion to rebuke his wife, in my hearing, for breaking this tabu also).

If the owner of a gun constantly uses it for shooting big game, he should not keep, or place it, in a leaning position; otherwise animals that he shoots, if mortally wounded, will not fall dead for some time. (From the same Malay as the above).

BĚLA KAMPONG.

Bĕla kampong is an annual ceremony which is performed by the Malays of the Endau—and, I believe, in other parts of the country as well—in order to avert misfortune and disease. It is difficult to give a suitable translation of the name for these rites, and the nearest approach that I can make is "cherishing the village." They are purely pagan and, as such, are frowned upon by the more orthodox Malays.

While I was stopping in Kampong Pianggu on the Endau River in August of this year (1917), a *bĕla kampong*, which was about to be held, was postponed owing to the presence of three Dyaks, who were with me. These men were engaged in shooting birds and mammals and in collecting insects and botanical specimens, such actions being tabu while the ceremony is in progress.

The Dyaks having left me temporarily, I asked the *Pawang* to perform the rites while I was in the village, and before my men should return from up-stream. This, however, appeared to be impossible, as he each day made some excuse—that there was a wedding on, or that someone had died and that it was tabu to hold the *bĕla kampong* in consequence. As I had already made arrangements for leaving the Endau, I was unable to postpone my departure until the *Pawang* should fix upon an auspicious day; nevertheless, by dint of questioning him, and others, I got some information which is, perhaps, worth placing on record.

According to old custom while the *bĕla kampong* is being performed, the village is laid under a three days' tabu by the *Pawang*, and during this period strangers must not enter it, nor may any of the inhabitants shoot animals, gather cocoanuts, *sireh*, or banana leaves; leave the village: dig their land; use abusive language; or make a loud noise (*e.g.* beat gongs as at a wedding).

The day chosen for the beginning of the rites depends partly on the *Pawang's* dreams. Should he have fixed a day, he will put it off if he has an unlucky dream during the night before—that he is being chased by a tiger, for instance, or that somebody is angry with him; but will hold it if his dreams are lucky (*e.g.* that he has been given many presents).

When a village is under tabu white rags are tied to cords at the bathing-places (*jamban*), if the settlement is on the main

river: but, if it is on a small side-stream, a cord, from which rags are suspended, is frequently stretched from bank to bank.

Nowadays only a one day's *bĕla kampong* is allowed at Pianggu and the prohibitions with regard to persons arriving at, or leaving, the village are no longer in force.

It appears that *bĕla kampong* on the Endau is performed rather with a view to keeping the local spirits of the soil in a good temper, and gaining their aid against invading evil, than with a view to banishing troublesome and evilly disposed supernatural beings, a not uncommon practice in many parts of the Malayan region, and one which is resorted to on the Endau if epidemic disease appears, when the villages are placed under a seven days' tabu, and spirit-ships launched. These are supposed to carry away the *hantu* (spirits) which are causing the trouble.

I mentioned the custom of the yearly purification of villages by means of spirit-boats to the *Pawang* of Pianggu and he said, "*Lain pawang, lain adat*" (other *Pawangs*, other customs).

I obtained very few details with regard to the ceremony proper, but it appears that the *Pawang* makes a round of the village, collecting small offerings of food from each householder, and that towards evening on the third day he places, or hangs, these in the jungle, asking the spirits to accept the presents made to them, and to protect the village throughout the ensuing year.

XXIV. NOTES ON THE GENUS *PETAURISTA*. *Pall.*, WITH DESCRIPTIONS OF TWO NEW RACES.

By H. C. Robinson, *C.M.Z.S.* and C. B. Kloss, *F.Z.S.*

The form of *Petaurista petaurista* inhabiting the mountains of the extreme east of Java is separable at a glance from that found in the western end of the island and in the absence of citation of the typical locality we have selected the Preanger Regencies as the habitat of the typical form. The eastern race may be described as:—

Petaurista petaurista nigricaudatus, subsp. nov.

Type:—Adult male with slightly worn teeth (skin and skull), collected at Ongop Ongop, Idjen Massif, 5,700 feet, near Banjoe-wangi, East Java, on April 9th, 1916, by Federated Malay States Museums Collector. F.M.S. Mus. No. 323/16.

Characters:—Differing from all other forms of the *petaurista* (*nitidus*) section in having the general colour of the tail black, the sub-basal portions of the hairs ferruginous maroon; ears dark chestnut, black orbital ring extensive, feet and hands black, this colour more extensive than in other forms and extending along the margin of the uropatagium.

Colour:—Above glistening chestnut maroon, duller and less maroon than in the West Javan form (*P. petaurista*), head and sides of the face more bay. All the hairs of the upper surface with black tips, most pronounced along the median line; nose, chin, a broad orbital ring and the vibrissae, black. Hands and feet black, with little or no chestnut on the metapodials, margin of the antibrachial and interfemoral membranes black, parachute ochraceous salmon, more rufous on edge, lower surface similar. Ears dull brown, the hairs at the base tipped with black, thinly clad with short black hairs on the interior of the basal part of the conch, mixed with brownish chestnut at the tips. Tail glossy black above, the bases of the hairs grey, the median area clouded with maroon, this colour being more noticeable beneath; tip not noticeably blacker.

Skull:—Does not apparently differ from that of *P. p. melanotus* from the Malay Peninsula; teeth slightly larger.

Measurements of the type:—Head and body, 436 (400[1]); tail, 462 (534); hindfoot, 74 76); ear, 41 mm., taken in the flesh by native collector.

1. Measurements in parenthesis are those of an adult male *P. p. melanotus* from Lay Song Hong, Trang, Siamese Malay States. F.M.S. Mus. No. 1226/10.

Cranial measurements: greatest length, 70.9 (72.0); condylo-basilar length, 64.0 (62.0); palatilar length, 32.9 (32.5); diastema, 15.0 (14.7); upper molar row, including pm^3 16.9 (16.5); interorbital breadth, 15.7 (15.3); postorbital breadth, 18.1 (18.4); zygomatic breadth, 48.7 (48.2); length of nasals, 22.4 (22.7); breadth of combined nasals, 13.3 (13.0) mm.

For detailed measurements of the series see p. 226.

Specimens examined:— Six, three from the type locality and three from Sodong Jerok, 3,900 feet, also on the Idjen Massif.

The series obtained are all very uniform and differ very markedly from that from Tjibodas, West Java, which we have assumed to be the typical race in brighter general colouration, the general hue being more brownish in the Tjibodas skin, with the feet dark brown, not pure black, and the orbital ring narrow. The greatest difference however, is in the tail, which is ferruginous bay with a terminal black tip in the western animal as in all others of the group which we have been able to examine, though it should be noted that Hose[1] describes a specimen, presumably from Borneo, which appears to agree closely with the above form, though other authorities specifically state that the tail of the Bornean race is rufous or ferruginous with a black tip.

The Penang race, on examination of a considerable series, differs sufficiently from that inhabiting the mainland to receive a name:—

PETAURISTA PETAURISTA PENANGENSIS, subsp. nov.

Type:—Adult female (skin and skull), collected at Telok Bahang, Penang Island, on 27th March, 1911 by E. Seimund. Federated Malay States Museum No. 1413/11. Original number 4211.

Diagnosis. External characters precisely as in *P. p. melanotus* from the south of the Malay Peninsula but size smaller and rostrum shorter and relatively broader.

Dimensions. See table on page 226.

Specimens examined. Three, all from the type locality.

PETAURISTA PETAURISTA TERUTAUS, Lyon.

Petaurista terutaus, Lyon, Proc. Biol. Soc. Washington, xx, p. 17 (1907).

This race was described by Mr. Lyon from a single specimen collected by Dr. W. L. Abbott in 1904.

Though the island has been visited by us on several occasions we never succeeded in obtaining specimens until December 1916. In that month, however, considerable wood cutting was going on in the island opening up vistas in jungle and we were so fortunate as to obtain three adults.

[1] Hose, Mammals of Borneo, p. 41 (1893).

These agree well with the original diagnosis and show that the race is very distinct from the mainland form and seeing that the original account was based on the unique type only it may be well to give a description of our series.

General colour much browner and less rufous that *P. p. melanotus* (type locality here designated as Selangor), the hairs on the middle of the sides with buff tips giving the effect of a pale elliptical patch. Limbs chestnut brown, becoming black on the metapodials and digits. Head varying from greyish buff to cinnamon buff. Parachute like the back or the limbs; uropatagium edged with black, edges of parachute buffy grey; tail like the back, extensively blackened distally but the dark colour not sharply margined, bases of the hairs throughout black, the base of the tail also washed with black. Muzzle, chin and eye ring black, ears with proectote ochraceous, metectote extensively black. Undersurface, pale salmon orange, foreneck whitish, inner sides of limbs blackish brown.

Specimens examined:—Three (1 ♂, 2 ♀) from Telok Wau (Wanderer Bay), East side of Pulau Terutau, Straits of Malacca.

Dimensions:—See table on page 226.

Measurements of Four Forms of **Petaurista petaurista** (Pall.)

Locality	Sex	Body: Head and Body.	Body: Tail.	Body: Hindfoot.	Skull: Total length.	Skull: Condylo basilar.	Skull: Palatilar	Skull: Diastema.	Skull: Upper molar row.	Skull: Interorbital breadth.	Skull: Postorbital breadth.	Skull: Zygomatic breadth	Skull: Length of nasals.	Skull: Breadth of nasals.	Condition of teeth.	F.M.S. Mus. No.		Remarks
Petaurista petaurista nigricaudatus.																		
Sudong Jerok, 3,900 feet Banjoewangi, E. Java.	♂	435	464	70	70.2	62.1	31.2	14.4	16	17	18	48.8	21.8	13	Worn	320/16	Adult	N. C. M. Type of subspecies.
,, ,,	♂	425	485	75	72.2	63.2	32.8	15	16.8	16.2	18.8	47.2	22	12.9	,,	321/16	,,	N. C. M.[1]
,, ,,	♂	405	464	72	68.8	62.2	32	14	17	15.9	19.7	48	21	12.9	Ml worn	322/16	,,	,,
Ongop Ongop, 5,700 feet..	♂	436	462	72	70.9	64	32.9	15	16.9	15.7	18.1	48.7	22.4	13.3	Worn	323/16	,,	,,
,, 5,700 ,, ,,	♂	415	430	67	68.2	60.3	31.1	13.8	17.1	14.6	17	48.3	20.3	13	Ml. worn	324/16	,,	,,
,, 5,700 ,, ,,	♀	424	446	74	70.8	63.1	33	15	15.9	15	17	49.2	21.3	13	Worn	325/16	,,	,,
Petaurista petaurista petaurista.																		
Tjibodas, W. Java, 4,500 ft	♀	415	503	73	..	..	33.2	14.8	17.2	15.5	16.4	..	19.8	12.8	Unworn	189/16	Sub-adult	Teeth fully up unworn.
Petaurista petaurista penangensis.																		
Telok Bahang, Penang Id.	♀	398	492	72	67	58.4	30.2	13.6	16	15	15.6	44.3	19.1	13	Sl. worn	1413/11	Adult	Type
,, ,,	♀	408	405 (imp.)	74	68	59.1	30	13.5	16.3	15	18	46	19.4	12.9	Worn	1423/11	,,	,,
,, ,,	♂	363	442	66	64.4	56	29	12.6	15.1	13	18.7	44	18.3	11.8	Unworn	1424/11	,,	,,
Petaurista petaurista terutaus.																		
Terutau Id. ,,	♀	385	452	67	65.3	58.3	30.2	13.9	14.8	11.8	15	42.7	21	11.9	Sl. worn	170/17	,,	,,
,, ,,	♀	372	460	67	65.2	56.9	30.2	13.3	14.8	12.3	15.7	42.2	19.9	10.8	Unworn	169/17	,,	,,
,, ,,	♂	391	408	65	65.1	56	29.1	14	14	12.9	16	44.1	20.1	10.9	Ml worn	171/17	,,	,,
,, ,,	♂	385	450	..	64.3	57	..	..	14.2	12.4	16.6	44.3	..	..	..	123934	,,	Type U. S. N. M.

[1] N. C. M.—Native collectors external measurements.

XXV. PRELIMINARY REPORT ON CAVE EXPLORATION, NEAR LENGGONG, UPPER PERAK.

By Ivor H. N. Evans, B.A.

Early in 1917 I visited Lenggong, in Upper Perak, with a view to excavating certain of the caves and rock-shelters, which are common in the neighbourhood of that place. Some exploration of such sites had already been conducted by Mr. L. Wray, then Curator of the Perak Museum, in the years 1886, 1891, and at some later date (not stated), the caves that he dealt with being situated in Gunong Cheroh, near Ipoh. His finds, though sufficiently interesting, did not throw any great amount of light on the question of the early inhabitants of the Peninsula. To sum up his work, he proved that some of the rock-shelters and caves of the Peninsula were formerly occupied, for a considerable time, by a people who lived largely on the flesh of wild animals (and broke their bones to obtain the marrow), while they consumed quantities of fluviatile mollusks; who used mealing stones and red haematite paint; and were, in some manner, able to possess themselves of a few valves of a species of marine shell (*Cyrena sumatrensis*).

A stone celt, that is a natural stone of convenient shape ground to a sharp edge, was discovered during the later excavations at a depth of two feet. Mr. Wray concluded from the finding of this specimen that the people who inhabited the caves were not necessarily the makers of stone implements, "but only that they were contemporaneous with the makers of the implements, from whom they sometimes obtained one by barter or otherwise, in the same way as the modern Sakai get iron axes and chopping-knives from the Malays." This may, of course, have been so; but, if the makers of the stone implements preceded the inhabitants of the caves (a point which his excavations did not prove), a cave-dweller may have met with the aforesaid implement lying on the surface of the soil and have taken it home with him, just as the Malays do with these lithic relics at the present time.

On the day after my arrival at Lenggong, I visited the Gua Kajang, a natural tunnel which pierces a limestone hill. A path leading from near Lenggong to Kampong Gelok passes through it. At the entrance facing Kampong Gelok there are two large bays, one on either side of the cave-mouth. These are rock-shelters of just the type which were, and are, usually favoured by cave-dwellers. I made an inspection of the floor of the shelter on the left, which was the deeper of the two, and found a large number of the shells of fluviatile mollusks (belonging to the genus *Melania*) in a hollow worn in it

Vide *Journal of the Royal Anthropological Inst.*, Vol. xxvi, pp. 36-47. *Journal of the F.M.S. Museums*, Vol. i, p. 13.

by the continual dropping of water from the point of a large stalactite. I therefore decided that these bays would probably be well worth excavating.

I may remark here that the rock-shelters in the neighbourhood of Lenggong are frequently visited, and sometimes occupied for short periods, by the Negrito tribesmen who frequent the locality. The two mentioned above, and others which I examined later, showed traces of having been recently used, among the remains left behind by the Negritos being bamboo sleeping-platforms, sections of blow-pipes, burnt-out fires, and the bones of soft turtles, bats and flying-foxes, which had been roasted and consumed on the spot. The walls of the Gua Kajang and the two bays were covered with the names of Malay visitors written in Arabic or Roman character, while Chinese too had inscribed their signatures in their native ideographs. On the walls of the left-hand bay, however, I found some patterns, drawn with charcoal, which were obviously the work of Negritos, since they were exactly similar to those which they engrave on their dart-quivers. Some other very rude drawings should also, probably, be attributed to these people. One of them, seemingly of an elephant drawing a four-wheeled waggon, had points of interest; for the artist, wishing to depict a vehicle of this kind, but either being unable to visualise it as it would appear when viewed from the side, or not being skilful enough to depict the parts of the off-side wheels which would be seen, had sketched the two near wheels and then added another couple, which were not attached to the waggon at all, one being placed in front of it, and the other behind.

I came into contact with the Negritos on two occasions, and once employed two men of the tribe to assist me in digging. I was thus able to get them to talk to me about their habit of using the caves, and to hear what they had to say with regard to the specimens found. On their visiting me at Lenggong Rest-House I also showed them three polished stone implements which I had purchased from Malays, who had found them in the surface-soil of land planted with rice or rubber. The Negritos called these *batu karsh*, "thunder stones," which is practically equivalent to the Malay name for them (*halilintar or batu lintar*). I do not think that they have any traditions of their ancestors using anything of the kind.

Having determined to excavate the left-hand bay, I started work with a few coolies. I first of all had small trial pits sunk here and there in the cave floor with the object of gaining some idea of the nature of the deposits and of their thickness. In every pit fragments of bones and spiral fresh-water shells were found in quantities. At the further end of the cave the deposit proved to be only a few inches in depth, but towards the mouth it was over four feet thick. About the middle, at a depth of two feet, a hard stratum of shells and broken bits of bone cemented together with lime was encountered, with about another foot of

loose shell, bone, and earth deposit lying below it. Beneath this was the limestone rock of the hill in which the cave is situated. For the next few days, after opening these pits, we were engaged in excavating a block of the cave floor to a length of thirty-one feet and a breadth of about eight feet, the excavation being carried down to the solid rock. We were rewarded by the discovery, with which I will later deal in detail, of large quantities of the spiral shells mentioned above; numbers of fragments of bone, chiefly mammalian, some pieces of red iron oxide, similar to those found by Mr. Wray at Gunong Cheroh[1]; a round water-worn stone, probably used for grinding; a mealing-slab; some pottery; parts of a human skeleton; a chipped stone implement of primitive type, and a rather doubtful implement of red stone.

The floor of the cave consisted of a mass of shells and bones mixed with earth and lime, the latter, however, not being usually present in sufficient quantity, or never having been moist enough, to bind the deposit together. The bones found were mostly in a fragmentary condition, having seemingly been pounded to bits in order to extract the marrow. Many of the fragments were blackened, or browned, by burning, and some, from the hard layer mentioned above, were much mineralized. No marks of gnawing were to be observed on any of them, so it would seem likely that the cave-dwellers did not keep dogs. No bone implements of any kind were found, and only one small piece which shewed signs of having been cut with a sharp instrument. Remains of the following animals were detected —deer (*Cervus unicolor*), muntjac, squirrel, rhinoceros, bamboo-rat and wild-pig.

The molluscan shells belonged to the genera *Unio* and *Melania*. The former were rare, the latter abundant, while a peculiar feature was that in every case the topmost whorls of the spiral shells had been broken off,[2] evidently for the purpose of facilitating the extraction of their contents. The Patani Malays of Upper Perak search for these mollusks for food,[3] but they told me that the Negritos did not do so, this information being subsequently confirmed by several men of the local tribe, particularly by the two whom I employed in digging. Furthermore, no such shells were found among the animal and other recent remains which the Negritos had left in the caves, nor do I remember ever having seen them lying about in their encampments.

I have already mentioned that a mealing-slab, very similar to those obtained by Mr. Wray, was discovered in the cave. This was turned up at a depth of about two feet from

[1] These are in the Perak Museum

[2] Mr. Wray notes that the shells of *Melania* found in the cave excavated by him had been similarly treated

[3] The Malay boil the mollusks and suck them out of their shells. The top whorls of the shells are knocked off before boiling, in order to render their contents easy to extract

the surface in the lime-cemented layer of shell and bone deposit. It is a block of limestone, hollowed out on one surface by constant use.

The hard layer of deposit proved to be the richest in interesting objects and, in addition to the grinding slab, there were discovered in it the mealing or grinding-stone, the human remains, and the stone implement already mentioned.

The mealing-stone, a circular water-rounded granite pebble, is stained with the red pigment referred to above. Other water-worn stones, mostly of quartz, were found in fair numbers, all having evidently been brought home by the cave-dwellers with the intention of making use of them.

Some of these also were stained with pigment, having been probably used for grinding it up.

The stone implement was found in a small trial pit, sunk previous to general excavation. I shall, however, describe this specimen later, when dealing with similar objects obtained in the course of excavating the other bay at the mouth of the Gua Kajang. The human remains were, rather unfortunately, first discovered by one of my Malays. This man, being tired with digging, had left the spot at which we were working, and had started scratching and burrowing in the trial pit just mentioned. When he had been thus employed for some time, he brought me a fragment of human jaw with some teeth still in it, saying that he had found a good many other pieces of bone and had thrown them out of the hole. I, therefore, set to work to collect as many of the broken bits as possible and to excavate some pieces of jaw which were visible in the burrow that he had made. There were thus retrieved the greater portions of an upper and a lower jaw, but only one small portion of the skull, some fragments of ribs, and some finger-bones. When the surrounding ground, which formed part of the block that I had decided to open, was properly excavated, some arm, leg, foot, and other bones were also discovered; these were removed, as far as was possible, imbedded in lime and shell matrix. A very large part of the skeleton was missing, and our efforts to find the rest of it were not successful.

These bones have not yet been cleaned or reported upon by an expert, so I do not feel justified in making more than a few remarks anent them. Judging by the teeth, they are those of an aged person, the worn-down state of the molars being remarkable.[1] The front teeth appear to have been filed down to a certain extent, a practice still indulged in by the Malays and some of the Negrito tribes. I could see no signs of the earth above the body having been disturbed since its first deposition. The bones were, as already stated, imbedded in a matrix of shells and fragments of bones, were hard, though

[1] This is also a noticeable characteristic of some of the human teeth found by Mr. Wray.

brittle, and seemingly much impregnated with lime from the stratum in which they lay. I am inclined to think, therefore, that the skeleton was contemporaneous with the deposit in which it was found. Since the skeleton was incomplete, we must suppose that the body was partly destroyed[1] after death.

The pottery, mentioned above, I shall also treat of in connexion with the finds made in our second set of excavations, carried out, as I have observed, in the other bay at the Gelok entrance to the Gua Kajang. This was considerably smaller than that which we opened first,[2] having a length of forty feet and a breadth of twenty, and being subtended by only two walls. The time at my disposal was not sufficient to allow of the whole of the site being explored and I contented myself with opening two square pits (each 5 feet by 5 feet), in the same line, but separated by a band of earth four and a half feet wide. In these we found that the shell and bone deposit extended to a depth of about three feet, with several inches of mixed clay and sand lying below. The two pits were dug at about a distance of two feet from the side-wall of the bay, and the measurement from the end wall to the nearest edge of the innermost of the two was five feet six inches. In one of these excavations a rough stone implement was found at just over a foot from the surface, and several flakes and a core at depths ranging from one to two feet. Fragments of pottery were also present in small quantities—chiefly in the more superficial layers, but one or two pieces were found at a depth of nearly two feet.

To turn now to the subject of manufactured stone implements and flakes found in the course of our explorations.

In both sets of excavations a large number of pebbles were met with, which were obviously not local: many of them were of quartz, others of some dark, fine-grained metamorphic rock, or of red chert (?). These must evidently have been brought home by the cave-dwellers either for use in their natural state, or for the purpose of making implements.

Now the flakes, nearly all of which have well developed bulbs of percussion, must, I think, owing to the situation in which they were found, be allowed to be made by man. They have not yet been examined by a geologist with a view to determining their materials, but the following rocks seem to be represented—red chert (one flake); limestone (one flake); reddish-yellow chert (?) (two flakes); yellow chert (?) (one flake); black metamorphic rock (two flakes); a fine-grained ochre-coloured stone (one flake); stalactite (one flake). In addition numerous fragments of pebbles of various kinds were found, which do not exhibit definite signs of working. The core shews clear traces of at least eleven flakes having been

[1] Perhaps by porcupines. The body may not have been buried at all, but merely left lying in the cave.

[2] The first bay was a small cave seventy-six feet long with a minimum breadth of about ten feet.

removed from it. Its material is a black and very fine-grained rock, something like black flint in appearance. It seems to have been easy to work, the channels left by the removal of flakes being smooth, and the ridges between them sharply defined. Thin edges of the rock are slightly translucent.

With regard to the two stone implements and to a few rather doubtful specimens.

One implement, a broadly lanceolate object, that which was found near the human remains, is roughly chipped out of a piece of granite; a large part of the upper side being the original smooth and weathered, or water-worn, skin of the rock. This is yellowish in colour. The stone has been trimmed to shape by blows delivered on the under edge, the flakes thus splitting from the upper surface. Granite is not particularly suitable for working, being of too coarse a grain, and the flaking is therefore rough. Some trimming of a similar kind is observable round the edges of the lower surface, but is not so well marked as above. A patch in the centre of this side is also stained yellow and appears to be the natural skin of the stone, but is rougher than that on the upper surface.

The other well marked implement is very similar in outline to that just described, but the under surface is flattish, while the upper is turtle-backed. The material from which it is made is a hard and fine-grained black rock, probably metamorphic. An island of the original greyish skin of the pebble is left on the centre of its upper face and forms its highest part. Chipping extends from the edge to the margin of this island. The flakes removed from the under surface were evidently much larger than those from the upper. The rock, though fine-grained, does not seem to have been easy to work.

We now come to two other specimens which are not so well defined. One of these has been extensively chipped at the edge till the "front" of it is almost semicircular. The material of this slab is a fine-grained stone of a dark purple-red colour about seven-tenths of an inch in thickness, which has both faces worn smooth by river action. An edge has been broken away, but whether previous to chipping or not, I cannot say for certain. The other specimen appears to have been intended for an implement of similar outline to the first two described and is probably in an unfinished state. Its material is a dark, fine-grained stone and a portion of the original water-worn skin remains on either face. Chipping is fairly extensive, especially on the upper surface towards the point. Below, flakes have also been removed in numbers, but they do not reach so far towards the middle.

About two other objects I am very doubtful. They shew no obvious signs of chipping, and none of grinding,

yet their shape is peculiar, and their material—a black, fine-grained rock, seemingly similar to that of the last-described specimen—is not, as far as I know, found in the neighbourhood of the caves. It seems probable, therefore, that the two stones were brought to the cave by its inhabitants. The first, did it shew signs of chipping or of polishing, might from its shape, be a portion of a neolithic-type stone axe: the surface of the object, however, appears weathered, which it would not be, had it been a part of an implement thrown away within the cave owing to breakage during manufacture; nor would an implement in use shew these signs when broken and left in such a sheltered position.

The second specimen is smooth on one side, slightly rough on the other. It, also, has rather a curious form, and appears to be of a rock similar to that of the above; here again I cannot detect any obvious signs of working. Possibly it is a thin flake removed from the surface of a water-worn pebble.

Before bringing this paper to a close we have still to deal with the pottery.

In the bay first excavated pottery was met with only from the surface to a depth of about one foot, or a little more towards the mouth of the cave, where the deposits were deepest. Several specimens were discovered here. Two of them were seemingly small dishes with circular feet. One is of a stout, blackish coloured ware, and includes a part of the rim; the other is similar except that the ware has a reddish tinge. In both instances the feet have been broken off and only their bases remain. Another object which we found is a small pipkin or water-pot with a roughly tooled pattern on its bottom and the lower parts of its body. Many fragments of this ware were encountered. My Malay coolies said that they thought that pipkins of the same kind were still made in the Siamese Malay States, but that they did not know of any modern articles similar to the two dishes. Some small pieces of pottery of other types were also met with, but none of them were at all remarkable.

In the second bay the pottery found was in small fragments, and was of the same sort as the pipkin.

Let us now see what inferences may be fairly drawn from the objects discovered in the caves. It has been noted that the deposit of shells and bone fragments were not of any great thickness, and from this fact we may conclude that the caves were either inhabited for a comparatively short period of time, or that they were only used at intervals, and that the oldest deposits are, therefore, fairly ancient.

There is, I think, sufficient evidence to warrant our saying that some of the former dwellers in the caves understood the working of stone by chipping, and used stone implements: for two true implements were discovered, and two which are probably so, as well as a fair number of flakes and a distinct

core. The finding of several implements in a cave together with flakes is fairly conclusive evidence that the inhabitants understood the working of stone, but the discovery of a single implement, such as that recorded by Mr. Wray, is not necessarily so. Whether the dwellers in the Lenggong caves knew how to polish, or make, stone implements by a rubbing down process must, on the evidence before us, remain a matter for doubt; but, if they did, and we are to regard the specimens that I have described as being roughly blocked out and unfinished implements of neolithic culture, it is difficult to see into what known Peninsular type, or types, they were to be turned. On the other hand the fact that the stone implements were made by former inhabitants of the Lenggong caves increases the probability of Mr. Wray's polished implement having been made by cave-dwellers too. What relation in point of age the Lenggong deposits bear to those of Gunong Cheroh is, however, uncertain.

With regard to the use of pottery it would seem most probable that the earliest inhabitants of the Lenggong caves did not possess any; but a very little may, perhaps, have been in use while the making of stone implements was still a known art.

XXVI. FOUR NEW BIRDS FROM JAVA.

By H. C. Robinson, *C.M.Z.S.*

Dendrobiastes hyperythra vulcani, subsp. nov.

Adult male:—Very close to *D. h. malayana*, Ogilvie Grant[1], from the mountains of the Malay Peninsula and from Sumatra but differing in having the throat and breast somewhat paler, more yellowish orange, less rufescent, the fulvous wash on the flanks distinctly lighter and the middle of the abdomen whiter. "Iris dark, bill black, feet slaty purplish."

Adult female:—The upper surface more olivaceous than in the corresponding sex of *D. h. malayana*, the throat and middle of the abdomen whiter and the pectoral band and the flanks light yellowish fulvous brown, not rufescent brown. "Iris dark, bill black, feet light pinkish grey."

Dimensions (taken in the flesh). Male: Total length, 113; wing, 59; tail, 46; tarsus, 18; bill from gape, 15 mm.

Female:—Total length, 113; wing, 59; tail, 47; tarsus, 18; bill from gape, 14 mm.

Types:—Collected at Tjibodas, slopes of the Gedeh Volcano, 4-6,000 feet, Western Java, on 14th and 15th February, 1916. ♂ No. 2413. ♀ No. 2365.

Specimens examined:—Twenty-one, from the slopes of the Gedeh, at altitudes from 4,000 to 8,500 feet.

Six males from the Idjen Volcano, near Banjoewangi, Eastern Java, are perhaps even paler and brighter beneath, while a single female, which we have to associate with the males, differs very markedly in having almost the whole of the under-surface pale buffy yellow, the throat and chin being quite concolorous with the breast. In the absence of further female specimens and of examples from Bali I prefer not to describe it.

Pomatorhinus montanus ottolanderi, subsp. nov.

Adult:—Differing from the typical *P. m. montanus* of the mountains of Central and Western Java in having the white superciliary streak not continued past the eye to the base of the bill as is invariably the case in the western race. General colour of back, mantle and flanks rather more chestnut and less ochraceous rufous than in the western form, though this character is only noticeable when large series of each race are compared.

[1] *Muscicapula malayana*, Ogilvie Grant, Bull. Brit. Orn. Club, XIX., p. 10 (1906).

Measurements of type:—Wing, 94, tail, 105; bill from gape, 26; tarsus, 33 mm. *Type*:—Adult male from Sodong Gerok, Idjen Massif, 3,900 feet, near Banjoewangi, Eastern Java, April 1st, 1916. Very large series examined from the same vicinity from 1,400 feet to 5,000 feet.

Remarks:—Hartert, in a paper on birds from the Ardjuno has already noticed the differences in the superciliary streak (Nov. Zool. iii, p. 539 (1896), while a reference to Horsfield's original description and Plate (Zool. Res. Java (1824) of *P. montanus* show these characters as strongly marked. Horsfield's specimens came from Merbabu in Central and Prahu in West Central Java, while my own material, consisting of over twenty skins, is from the Gedeh in Western Java. Under these circumstances I consider that the eastern form is perfectly entitled to subspecific recognition, though in a considerable number of specimens traces of white are discernible in the loral region.

STACHYRIS ORIENTALIS, sp. nov.

Separable at a glance from *St. thoracica* (Temm.) from Western Java, (eight specimens examined), in having the whole head and hind neck slaty black, clearly differentiated from the mantle. Rest of the upper surface of a more ochraceous rufescent, less chestnut tinge. Beneath, the white pectoral collar forms a regular gorget and is not encroached upon in the middle of the throat by the black of the chin and neck, as in the western form. White gorget bordered beneath by a black band broadest on the sides of the breast, this band being entirely absent in *St. thoracica*.

Wing, 82; tail, 79; bill from gape, 25; tarsus, 31 mm.

Type:—Adult male from Sodong Jerok, Idjen Massif, 3,900 feet, near Banjoewangi, East Java, on March 28th, 1916.

Thirteen specimens examined.

STACHYRIDOPSIS MELANOTHORAX INTERMEDIA, subsp. nov.

Intermediate between *St. m. melanothorax*[1] (Temm.) from Western Java and *St. m. baliensis* (Hartert)[2] from Java. Differs from the former in having the middle of the breast sandy buff, uniform with the flanks, not white, and from the latter in having the chin and throat pure white, only very faintly tinged with buff. Outer webs of the primaries, decidedly richer brown than the back but not nearly so bright as the wing coverts.

Adult female (type):—Wing, 60; tail, 60; bill from gape, 19.5; tarsus, 23 mm.

[1] *Myiothera melanothorax*, Temm. Pl Col. II, pl. 185, fig. 2 (1823).

[2] *Cyanoderma melanothorax baliensis*, Hartert, Bull. Brit Orn. Club, XXXVI, p. 2 (1915).

Another female specimen, less adult, wing, 57; tail, 56; bill from gape, 18.5; tarsus 21 mm.

Locality:—Sodong Gerok, Idjen Massif, 3,900 feet, near Banjoewangi, Eastern Java.

I cannot agree with either the late Dr. Sharpe or Dr. Hartert that this bird is correctly placed in the genus *Cyanoderma*, Salvad., of which the type is *Cyanoderma bicolor* (Blyth), from Borneo, which has naked cheeks, whereas the present bird has them feathered.

As Dr. Hartert notes, *St. melanothorax* has been omitted from the Catalogue of Birds (Vol. VII.) but is carefully described by Sharpe in 1884. (*Notes Leyden Mus.* vi., p. 177 (1884).

XXVII. ON TWO NEW SPECIES OF FLOWER PECKERS (DICAEIDAE) FROM THE MALAY REGION.

By H. C. Robinson, *M.B.O.U.* and C. B. Kloss, *M.B.O.U.*

Piprisoma sordidum, sp. nov.

Differs from *P. modestum* (Hume), of the Malay Peninsula, Tenasserim and Siam in the absence of streaks on the under-surface and of white on the tail, from *P. obsoletus* (Mull. and Schleg.), of Timor and Flores in the latter character and in the duller undersurface, from *P. everetti* (Sharpe), of North Borneo and Labuan in the darker underparts and from *P. olivaceus* (Tweed.), of the Philippines in the duller upper surface.

Type:—Adult male, collected on 14th July, 1913, at Rawang, Central Selangor. F.M.S. No. 101/18.

Above dull brown, the feathers of the head with darker centres, the edges of the primaries, secondaries, upper tail-coverts and tail-feathers edged with olivaceous green, broader and greener on the inner secondaries. Beneath dull fuscous, chin and throat and the centre of the belly, whitish; under tail coverts whitish with greyish centres. Under wing coverts and axillaries, greyish, with dark centres to the former; sides of the face and lores greyish brown, malar region somewhat darker. Tail feathers with no traces of white.

Dimensions (in skin):—Wing, 60; tail, 33; tarsus, 13.5; bill from gape, 11 mm.

Remarks:—This bird is probably only a subspecies of *P. everetti*, Sharpe, Ibis 1877, p. 16; id. P.Z.S. 1879, p. 343, Pl. XXX, fig. 1, from which it differs in its very much darker colour beneath.

Dicaeum van heysti, sp. nov.

Nearest to *D. ignipectus* (Hodgs.), of the Himalayan countries and the mountains of the Malay Peninsula but entirely lacking any red in the plumage or any black abdominal patch, which character also separates it from *D. beccarii*, of W. Sumatra.

Type:—Male (vix adult), from Beras tagi, Mountains of NE. Sumatra, collected on 10th June, 1917, by A. D. van Heyst. Collector's No. 517.

Above like *D. ignipectus*, but the metallic colouring with a more greenish cast. Below, throat and upper breast almost pure white, flanks and sides of the breast dusky, slightly tinged

with olive. Abdomen olivescent, under tail coverts buffy with black bases. Axillaries and under wing coverts silky white: sides of the head slaty black.

Wing, 48; tail, 23; tarsus, 13; bill from gape, 10.5 mm.

Female:—Differs from the female of *D. ignipectus* in being more greenish and darker beneath, only the breast and abdomen being slightly washed with ochreous buff. (No. 512).

Specimens examined:—Three, the above mentioned male and female and an immature male, resembling the female, all collected at the same locality and on the same date.

Remarks:—There is little doubt that these specimens represent a species allied to but quite distinct from the continental *D. ignipectus*, the total absence of the black pectoral patch being the most characteristic feature. They cannot apparently be referred to *Dicæum sollicitans*, Hartert from Java.

XXVIII. FURTHER NOTES ON THE MONGOOSES OF THE MALAY PENINSULA.

By C. Boden Kloss, *F.Z.S.*

When I wrote the article on the Mongooses of the Malay Peninsula published in the last number of this Journal (pp. 123-5; September, 1917), some skulls were missing which have since been recovered and I am now able to give their measurements.

It will be seen that the skulls do not confirm the slight difference in size in favour of *Mungos javanicus peninsulae* over *Mungos incertus* indicated by the collector's external measurements taken in the flesh, but show that the two are of practically similar dimensions or that the difference, if any, is rather the other way about. The only difference between the skulls of the two species lies in the bullae, which in *incertus* are rather larger and this feature, with the colour differences, constitutes the distinction between the two.

The skulls of these indigenous Malayan animals differ from that of *Mungos mungos* in their greater length, that of *mungos* being shorter both actually and relatively to its breadth and having a shorter tooth row.

Measurements of **Mongooses** in millimetres.

—	Mungos j. peninsulae.			M. incertus.	
Number	951/11	971/13	955/11	1057/10*	68/17
Sex and age	♀ ad.	♂ old.	♂ ad	♂ ad.	♀ aged.
Head and body	373	364	371	350	361
Tail	282	276	254	276	265
Hind foot	71	57	63	63	62
Ear	29	23	23	20	22
Skull and teeth :—					
greatest length ..	71	78	77	78	80.5
basilar length, from back of i^3	65	69.8	68.4	70	72
palatilar length ..	34	37.2	38	38	40
c—m^2 (alveoli)	25.7	26.6	27.5	26.2	27.5
pm^1, length and greatest diameter	7.7×8.2	7.0×7.8	7.2×8.1	7.0×8.0	7.2×8.1
rostral breadth across roots of canines	14	13.8	13	13	14.4
postorbital breadth ..	14	11	9.9	10.8	11
braincase breadth ..	26	26	25	25	25.3
zygomatic breadth ..	38.2	39.2	37	38.2	40.8
length of bullae from the external base	16	16.1	15.8	16.7	16.7

* Type.

XXIX. ON THE SOUTHERN MALAYAN RACE OF THE WHITE-WHISKERED PALM-CIVET.

By H. C. Robinson and C. B. Kloss.

We have long thought that the Southern Malayan Race of *Paguma leucomystax* originally described by J. E. Gray from Sumatra was subspecifically distinct, but in the absence of fully adult specimens of the adjacent races have hitherto refrained from describing it.

We are now, however, in possession of fine adults of the true *P. leucomystax* from West Sumatra, *P. robusta*, (Miller), from the north of the Peninsula and of the Southern Malayan form which we propose to describe as

Paguma larvata annectens, subsp. nov.

Type:—Adult male (skin and skull), F. M. S. Mus. No. 191/09, collected at Bukit Gantang, Larut, Perak, November 1908, by Museum Collector.

Diagnosis:—Intermediate between the colder, greyer race from Trang and the deep maroon-black form, *P. leucomystax*, from Sumatra.

Colour:—Nape, mantle, upper and lower extremities brownish black, the nape and mantle having the under fur tipped with buffy; posterior parts of the body more yellow tipped and annulated with black, the general orange effect being richest on the rump; flanks slightly duller; tail like the rump, basally, becoming blackish on the distal half. Under-surface dull buffy. Top of muzzle slightly grizzled buff. A broad area extending from the eye to the ear and more narrowly down the sides of the neck, buff. Crown grizzled brown and buff. Sides of muzzle, chin and throat brownish; ears brownish black. Vibrissae white.

Dimensions:—(External dimensions of the type, taken in the flesh):—Head and body, 635; tail, 610; hindfoot, 102 mm.

Cranial measurements: greatest length, 127 (126[1]); upper length, 112 (116); condylo-basilar length 120 (121); basilar length, 115 (116.4); palatilar length, 57 (57); width of palate, including molars, 42.8 (41); interpterygoid space 25 by 13.2 (27 by 14); breadth of rostrum across the roots of canines, 24.7 (24); zygomatic breadth, 71 (69); anteorbital constriction, 26.2 (25.4); postorbital constriction, 25 (22.4); breadth of brain case above roots of zygomata 41 (41.4); mastoid breadth, 48 (45); occipital depth, 30.2 (30.4); mandible 94 (94); maxillary tooth row exclusive of incisors 43 (44); mandibulary tooth row, exclusive of incisors 48.3 mm. (50).

[1] Measurements in parentheses are those of the type of *Paradoxurus robustus* Miller, Proc. Biol. Soc. Washington, XIX, p. 26 (1906).

Specimens examined:—Five from Perak and one from Selangor.

The series of the genus before us, ranging from the Northern Shan States to Sumatra show that complete gradation occurs between forms assigned to *P. larvata* (Temm.) and *P. leucomystax*. All races of the genus must therefore be regarded as subspecies of the originally described *P. larvata*.

The synonymy of the Malayan form is much involved and many of the earlier names have no exact locality cited. We have been unable fully to examine the literature, but it is possible that *Paradoxurus jourdanii*, Gray, in Charlesworth, Mag. of Nat. Hist. I., p. 579 (1837) applies to the above described form, in which case, of course, Gray's name has priority.

The various races will be:—

Paguma larvata larvata (H. Smith). S. China.

Paguma larvata taivana (Swinh.). Formosa.

Paguma larvata hainana, Allen. Hainan.

Paguma larvata intrudens, Wroughton. N. Shan States (Goteik).

Paguma larvata grayi (Bennet). Himalayas and Sikkim.

Paguma larvata tytleri (Tytler). Andaman Islands.

Paguma larvata robusta (Miller). Tenasserim and N. Malay Peninsula.

Paguma larvata annectens, antea p. 243. S. Malay Peninsula.

Paguma larvata leucocephala (Gray). Borneo.

Paguma larvata leucomystax (Gray). Sumatra.

The generic status of *Paradoxurus laniger*, Hodgson, from Tingri, Tibet, which is only known from a skin and of *Paradoxurus musschenbroeki*, Schleg., from Celebes is uncertain.

XXX. NOTES ON MALAYAN AND OTHER MOUSE-DEER.

By C. Boden Kloss, F.Z.S.

There is in the Federated Malay States Museums a fairly large collection of *Tragulidae* from the Malay Peninsula and the immediate neighbourhood, and as there are available for the moment specimens from Borneo (belonging to Mr. H. C. Robinson) and from Siam (in my possession), the opportunity has been taken to review all this material.

In dealing with Mouse-deer in large series one cannot fail to be impressed with the large degree of individual variation that exists in adults as regards colouration, skull and dental characters and also size; and it is obvious that races must be judged, not by individuals, but by the average, or majority, features of series.

The only real differences amongst Malaysian[1] animals seem to be those of colour and these differences are so intimately mingled geographically that it seems best to regard all races as belonging to two species only—*javanicus* and *kanchil*.

Malays have various names for Mouse-deer—in the Peninsula there are current *napu (napoh)* and *munkonong (bĕngkumang)*, *pĕlandok*[2] and *kanchil*: the last two names are interchangeable but as a rule *munkonong* and *kanchil* are applied to the young of *napu* (Greater Mouse-deer) and *pĕlandok* (Lesser Mouse-deer) respectively.

I have proposed type localities for two old names hitherto undetermined; rejected two races proposed: and described two new ones.

Tragulus javanicus napu.

Moschus napu, F. Cuv., Hist. Nat. Mamm., III, livr. 37, pl. 329 (1822).

Tragulus javanicus, Cantor. Journ. Asiat. Soc. Bengal, XV, 1846, p. 269.

Tragulus napu, Flower, P.Z.S., 1900, p. 374; Wroughton, Journ. Nat. Hist. Soc., Bombay, XXIII, 1915, p. 717.

Tragulus canescens, Miller, Proc. Biol. Soc. Washington, 1900, p. 185; id., Proc. U. S. Nat. Mus., XXXVII, 1909, p. 5; Kloss, Journ. F.M.S. Mus., II, 1908, p. 148; id., op. cit., IV, 1911, p. 138.

Tragulus javanicus canescens, Kloss, Journ. Straits Branch Roy. Asiat. Soc., No. 53, 1909, p. 43; Lydekker, Cat. Ungulates, Brit. Mus., IV, 1915, p. 271.

[1] Malaysian—Pertaining to the Malay Peninsula, Sumatra, Borneo and Java. Malayan—Pertaining to the Malay Peninsula only cf. Sumatran, etc.

[2] Final *k* silent.

When Miller gave the name *canescens* to the Malayan Greater Mouse-deer he compared it with the napu of Lingga Island, later named *T. pretiosus* by him[1] in the belief that the latter represented typical *T. javanicus napu*. He has since written "*Tragulus napu*.(of Sumatra) proves to be a greyish animal quite distinct from *T. pretiosus* but somewhat closely resembling *T. canescens* of the Malay Peninsula,"[2] and again later "The common peninsular *Tragulus canescens* differs very slightly, if at all, from the Sumatran *T. napu*. In naming it I was under the impression that the napu of Lingga Island (*T. pretiosus*) represented the Sumatran animal."[3]

When Wroughton wrote (*l.c.s.*) of South Tenasserim animals "Geographically they should be the *T. canescens* of Miller, but differ so markedly in several characters from his description that I prefer to retain the older name," he was perhaps unaware of this or that Miller's description, being wrongly based, might convey a wrong impression.

I have compared a series ranging from South Tenasserim to Singapore, with specimens from Sumatra and cannot find any differences: and as long as the occurrence of a distinct race in the Peninsula remains unproven, as seems to be the case, we have no right to use a distinct name for Malayan animals which should therefore stand as *T. j. napu*.

Habitat:—Sumatra and the Malay Peninsula.

Specimens examined:—Fourteen.

TRAGULUS JAVANICUS UMBRINUS.

Tragulus umbrinus, Miller, Proc. Biol. Soc. Washington, XIII, 1900, p. 191.

Tragulus (canescens) umbrinus, Kloss, Journ. F.M.S. Mus. II, 1908, p. 148; id. (partim) Journ. Straits Branch Roy. Asiat. Soc., No. 53, 1909, p. 44.

Tragulus javanicus umbrinus, Lydekker, Cat. Ung. Brit. Mus., IV, 1915, p. 273.

"Similar to *T. canescens* of the adjacent mainland but smaller in size and much darker in colour. Throat stripes blackish brown with scarcely a trace of pale speckling. Belly heavily washed with fulvous grey" (*Miller*).

We have only one rather immature example from the Langkawi Islands but it closely agrees with the above characterization. It is of a richer yellow than the mainland animal and more heavily clouded with blackish—the two colours more finely intermixed—and the sides of neck and body and the

[1] Proc. Acad. Nat. Sci. Philadelphia, 1902, p. 144

[2] Proc. U. S. Nat. Mus., XXVI, 1903, p. 439

[3] Proc. U. S. Nat. Mus., XXXVII, p. 5.

limbs darker. Below, the chevron on the foreneck is brownish black, scarcely grizzled, the collar is darker, and the whole middle part of the body is suffused with brownish-yellow, leaving only the pectoral and inguinal areas white: in peninsular animals there is at most a broad Y-shaped patch on the under-body.

Habitat: Langkawi Islands, West Coast of the Malay Peninsula.

TRAGULUS JAVANICUS TERUTUS.

Tragulus canescens umbrinus, Kloss (partim), Journ. Straits Branch Roy. Asiat. Soc., No. 53, 1909, p. 44.

Tragulus canescens terutus, Thomas and Wroughton, Ann. Mag. Nat. Hist., (8) IV, 1909, p. 536.

Tragulus javanicus terutus, Lydekker, Cat. Ung. Brit. Mus., IV, 1915, p. 272.

Seven examples collected between the end of February and the middle of March:—Like *T. j. napu* of the adjacent mainland but rather brighter generally, the sides more like the colour of the back, not greyish. Nape stripe obsolete, in some instances only just traceable: under side of body sometimes with a broad brownish band as in *T. j. umbrinus*, but the chevron of the foreneck paler and much grizzled with ochraceous as in *T. j. napu*.

One example is abnormal: on the foreneck the median white stripe is represented by a few hairs only, the rest of the neck between the white lateral stripes being blackish-brown grizzled with ochraceous.

Twelve examples collected in December:—much darker than the above owing to a general increase in pigmentation, the upper parts as dark or darker than dark Bornean animals (postea), the neck chevron much blacker and the middle part of the under body more extensively fulvescent, the latter area being slightly suffused with black also. Two specimens have the foreneck coloured as in the abnormal example mentioned above: in one of them the lateral white stripes are merely represented by two small patches.

Though the two series look notably different all the animals are easily separable from the mainland race by their yellowish (not grey) sides. The differences in colour *inter se* appears to indicate that there are seasonal pelages and that the change from dark to light phase takes place about January.

Probably a trifle smaller than the mainland race: the largest specimen examined has the hindfoot, c. u., 135 mm; the greatest length of skull 111 mm: a large Malayan napu measures 150 and 118 mm. respectively.

Habitat:—Terutau Island, north of Langkawi Island, West Coast of the Malay Peninsula.

TRAGULUS JAVANICUS BORNEANUS.

Tragulus borneanus, Miller, Proc. Biol. Soc. Washington, XV, 1902, p. 550; Lyon, Proc. U. S. Nat. Mus., XXXIII, 1907, p. 550.

Tragulus napu borneanus, Lyon, op. cit., XL, 1911, p. 64.

Tragulus javanicus borneanus, Lydekker, Cat. Ung. Brit. Mus., IV, 1915, p. 270.

Of six specimens from Paku Saribas, Sarawak, two are indistinguishable in general colouration from the Sumatran and Malayan napu: the others are more heavily clouded with black above. On the whole, the neck chevron in darker; the dark element being more intensely black, less brownish black.

Of two specimens from the Kapuas R, Western Borneo, Lyon says "The skins are practically indistinguishable in coloration from specimens of *T. napu* from Sumatra." Later, dealing with a large series, he sums up the position as follows:—"A careful comparison of these with a large number of specimens from various localities in Sumatra, the type-locality of *napu*, shows that the Sumatran and Bornean napus are almost identical in point of size, color, and cranial characters. The Bornean animal averages a very little smaller in most external and cranial measurements. At the same time the throat markings are slightly darker and the collar slightly wider than they are in typical napu. These differences, however, are very slight and not at all constant, and it is only possible to identify with certainty a little over half the specimens in each series."

Habitat:—Borneo and Pulau Laut.

Specimens examined:—Six.

TRAGULUS JAVANICUS STANLEYANUS.

This race was based by Gray on living animals of unknown provenance. Various suggestions have been made as to the habitat:—the Sunda Islands by Milne-Edwards, and the Malay Peninsula by several other writers. Twenty years acquaintance with Malaysia, however, has convinced me that no such form occurs on the mainland and that the examples known to Gray came from Battam Island, opposite Singapore, on the south side of the Strait, whence to this day living animals are not infrequently brought over and offered for sale in the Singapore bazaar.

Gray's description exactly fits the Battam race and Singapore is so obviously a port from which living animals might have been taken to England that I feel one would be wilfully blind to facts in refusing to accept Battam Island as the typical locality of *stanleyanus*, though Miller, while *stanleyanus* was looked on as a species of undetermined provenance, has described the Battam *stanleyanus* (first rediscovered by myself) as *Tragulus perflavus*.

The race also occurs in the adjacent islands of Gallang, Setoko and Bulang; and a closely allied form, *T. dacicollis*, inhabits the neighbouring island of Singa.

The original description is as follows:—"Rufescent fulvous, the hairs with black tips, below less bright; neck and chest bright fulvous; border of the chin, three stripes on the foreneck, breast, front and inner side of the thighs and the under side of the tail white; crown and feet to the knees darker fulvous; muzzle, stripes about the eyes on both sides, outer sides and margins of the ears black . . . . immediately distinguishable from all the other species by the brightness of its colouring, and by the absence of the nuchal streak, and of the white on the under surface of the body."

Mr. Oldfield Thomas has kindly supplied me with details of the type, which was certainly a large individual; but the dimensions are not greater than might be, and are, attained by Battam animals, for every race of Mouse-deer shows a considerable range in size when a series is examined.

The measurements are:—Hindfoot, including hoof, 134; upper extreme length of skull, 123; condylo basal length of skull 117; tooth row 43.5.

It was an old female with worn teeth that had lived in confinement, but the skull is sound and perfect: B.M. Reg. No. 48. 10.11.16.

Battam animals vary a little in the amount of black clouding on the upper surface of the body and in examples where it is strongest the chevron of the fore-neck is also a little blackened.

Specimens examined. Three at the moment of writing, though many more have passed through my hands.

The synonomy will be:—

Moschus stanleyanus, Gray, P.Z.S. 1836, p. 65 et Auct.

Tragulus perlaca, Miller, Proc. U. S. Nat. Mus., XXXI, 1907, p. 251; Lyon, ibid, p. 653; id., op. cit., XXXVI, 1909, p. 481; Miller, op. cit., XXXVII, 1910, p. 7, pl. 2, lower figure; Kloss, Journ. Straits Branch R.A.S., Soc., No. 50, 1908, p. 70.

Tragulus stanleyanus perlaca, Thomas and Wroughton, Journ. F.M.S. Mus. IV, 1909, p. 128; Lydekker, Cat. Ung. Brit. Mus. IV, 1915, p. 267.

TRAGULUS JAVANICUS FORMOSUS.

Tragulus formosus, Miller, Proc. Biol. Soc. Washington, XVI, 1903, p. 34; id., Proc. U.S. Nat. Mus., XXI, 1906, p. 251; id., op. cit., XXXVII, 1909, p. 6.

Tragulus stanleyanus formosus, Thomas and Wroughton, Journ. F.M.S. Mus., IV, 1909, p. 126; Lydekker, Cat. Ung. Brit. Mus., IV, 1915, p. 267.

Only one specimen is available: it differs from the Battam race principally in having the top of the face and head blackish and a somewhat blackened nape stripe: the clear colour of the neck does not extend on to the withers, which are darkened, the chevron of the foreneck is considerably more blackened, the collar is broader and the belly is a darker, more blackened fulvous. The form is somewhat variable and some individuals closely approach Battam animals.

Habitat. Bintang Island, Rhio Archipelago.

TRAGULUS JAVANICUS RUFULUS

Tragulus rufulus, Miller, Proc. Washington Acad. Sci., II, 1900, p. 227; Thomas, Journ. F.M.S. Mus. II, 1908, p. 106.

Tragulus (javanicus) rufulus, Kloss, Journ. Straits Branch Roy. Asiat. Soc. No. 53, 1909, p. 44.

This is the most brilliantly coloured of all mouse-deer, exceeding both *stanleyanus* and *formosus* in richness of tone. Neck deep ochraceous-orange, upper parts of body orange-rufous, rump and tail brilliant rufous brown; the black clouding which obscures the colour of the body is variable: in one or two examples of a large series it is practically absent; it is always slight on the limbs. The top of the head is like the back and generally there is a faintly indicated nape stripe of orange-rufous. The foreneck markings are like the sides of the neck but the chevron is frequently slightly sprinkled with black. The underside of the body is primarily white but in various ways there is an encroachment of fulvous: in only one example does the latter colour completely cover the belly between breast and inguinal regions, though the white between these areas is not infrequently reduced to two broad elongate patches separated by a fulvous median area which is generally blackened.

This character, as well as the nape stripe and brighter colour, separates *rufulus* from the Battam and Bintang animals: otherwise it would have some claims for consideration as *stanleyanus*: but it is highly improbable that material from such a little known and remote island as Tioman ever came to the notice of Europeans in the middle of last century.

Habitat. Tioman Island, East coast of the Malay Peninsula.

Specimens examined. Twenty.

TRAGULUS KANCHIL FULVIVENTER.

Moschus fulviventer, Gray, P.Z.S. 1836, p. 65

This "drifting" name has been the cause of a good deal of uncertainty and inconvenience because the exact provenance of the types is unknown: it was suggested that they came

from the "Malay Archipelago and Peninsula"—a region which, with Indo-China, covers the entire range of the *kanchil* group or species.[1]

Personally I regard the types of *fulviventer* and similar animals as [illegible] individuals showing an unusual development of fulvescence, but I propose to attach the name to animals from Singapore and the Malay Peninsula, selecting the former as the type locality, with the range extending to between 6° and 7° N. latitude and including the Redang Islands off Trengganu, and the Langkawi Islands, for the following reasons:—

Cantor, writing of Malayan pelandoks under *T. kanchil* and giving Singapore first among the localities, says "The colour and distribution of the [illegible] of the chest and abdomen are liable to individual variations, one of which gave rise to the supposed species *Moschus fulviventer*." (Journ. Asiat. Soc. Bengal XV, 1846, p. 268).

Thomas and Wroughton record two specimens from Singapore sent by us to South Kensington as *T. k. fulviventer* and state "Comparison with the type shows that these are undoubtedly Gray's species (Journ. Fed. Malay States Mus. IV, 1909, p. 128).

Of about 3 dozen specimens in the F.M.S. Museums from the range given above, rather more than one-third have in varying degree the abdominal pattern described by Gray, and three of them show further the fulvous band on the throat separating the white of the chin from the white streaks of the foreneck which is referred to in his supplementary description.

The latter feature, together with an extension of fulvous over the underparts of the body which restricts the white to areas on the chest and abdomen and in the region of the thighs, is the distinguishing character of *fulviventer* in its more richly coloured phase and though animals with such a phase are in the minority I think there is no doubt that they represent Gray's race: the more so that Singapore or Malacca are very probable places at which Hardwicke may have obtained the specimens seen by Gray.

The majority of the animals, however, which should now be regarded [illegible] lack the fulvous band behind the chin and have the underside of the body white with a line of varying width and colour running from the collar to the abdomen where it broadens out: when distinct white anterior and posterior areas [illegible] are brought about by an extension of fulvous from the sides to join the broad fulvous area on the abdomen. The [illegible] upper part of the forelimbs in always white.

[1] It [illegible] stating that Gray [illegible] Malacca and the Indian [illegible] LIV, pp. 130, 132), [illegible] "Malacca, as [illegible] The habitat originally [illegible] Indiae Orientalis.

Habitat:—See above.

Specimens examined:—Thirty-three.

The synonomy will be as follows:—

Moschus fulviventer, Gray, l.c.s.

Tragulus kanchil, Cantor (partim) l.c.s. (Singapore and Malay Peninsula), Thomas (partim), P.Z.S. 1886, p. 79 (Selangor and Singapore).

Tragulus javanicus, Flower (partim), P.Z.S. 1900, p. 374 (Perak, Selangor and Singapore); Bonhote (partim), op. cit. p. 883 (Kelantan).

Tragulus fulviventer, Stone and Rehn, Proc. Acad. Nat. Sci. Philadelphia, 1902, LIV, p. 130, t. 2. (Malacca and Indian Peninsula).

Tragulus ravus, Kloss (partim), Journ. F.M.S. Mus., II, 1908, p. 148 (Malay Peninsular region); id. op. cit. IV, 1911, p. 212 (Redang Ids.; Gyldenstolpe Arkiv for Zoologi, Stockholm, X, 1917, p. 31 (Perak).

Tragulus kanchil ravus, Bonhote, Journ. F.M.S. Mus. III, 1908, p. 11 (Pahang); Kloss, op. cit. IV, 1911, p. 44 (Pahang); Robinson and Kloss, op. cit. VI, 1916, p. 238 (Kedah).

Tragulus kanchil ravus, Kloss, Journ. Straits Branch Roy. Asiat. Soc., No. 53, 1909, p. 43 (Malay Peninsula and Singapore).

Tragulus kanchil fulviventer, Thomas and Wroughton, l. c. s. (Singapore); Lydekker, Cat. Ungulates Brit. Mus. IV, 1915, p. 285 (Singapore).

? Tragulus kanchil lancavensis.

Tragulus kanchil, Cantor (partim), Journ. Asiat. Soc. Bengal, XV, 1846, p. 53 (Lancavy Islands).

Tragulus javanicus, Miller (partim), Proc. Biol. Soc. Washington, XIII, 1900, p. 192.

Tragulus lancavensis, Miller, op. cit. XVI, 1903, p. 41.

Tragulus (ravus) lancavensis, Kloss, Journ. F.M.S. Mus., II, 1908, p. 148; id., Straits Branch Roy. Asiat. Soc. No. 53, 1909, p. 44.

Miller separated animals of Langkawi Island from *T. k. ravus* of Trang (postea), as being more brightly coloured with, in general, a rather greater extension of fulvous on the underparts. Such indeed are the differences in this connection but I find myself quite unable to separate Langkawi examples from the more southern form *fulviventer*.

Habitat:—Langkawi Island, West Coast of the Malay Peninsula.

Specimens examined:—Seven.

Tragulus kanchil penangensis, subsp. nov.

Type:—Adult male (skin and skull). F. M. S. Mus. No. 1542/11. Collected at Telok Bahang, Penang Island, on 11th March, 1911, by E. Semmund.

Diagnosis:. Colour more intense than in *T. k. fulviventer*. Upper parts Mars yellow, rather rufous on neck and forelimbs; hind-limbs tinged with umber brown: back much blackened: nape stripe very distinct, black and slightly grizzled; head speckled brown and ochraceous. Chevron on the foreneck mingled Mars yellow and black; collar band and a line down the centre of the breast clear Mars yellow; an ochraceous-orange Y-shape patch stretching from the posterior chest to the abdomen: remainder of under-part, back of forelimbs, front of thighs and underside of tail white.

Measurements:—Head and body, 465; tail, 70; hindfoot, c. u., 115; ear, 37 mm.

Skull:—greatest length, 99; condyloba-al length, 91; upper molar row (alveoli), 36; greatest breadth of skull, 44 mm.

Specimens examined:—Three adults and a juvenile from the type locality.

Remarks:—These Penang animals closely resemble an example of *T. k. rubeus*, Miller, of Bintang Island, Rhio Archipelago, the specimen of which only differs in having a darker head and an intensely black nape-stripe, but the latter feature is apparently not typical. The juvenile animal (hind-foot, c. u., 103 mm.) is much more fulvous as the whole of the under-body and limbs are suffused with orange-ochraceous except for two small white spots on the chest; the hairs, however, have white bases throughout: also on the throat there is a broad oblique fulvous band separating the white behind the chin from that of the foreneck. The last is a feature of *fulviventer*, Gray, but the Penang animals are far too brightly coloured to be referred to that race.

Tragulus kanchil ravus.

Tragulus ravus, Miller, Proc. Biol. Soc. Washington, XV, 1902, p. 163.

A slightly paler, duller race than *T. k. fulviventer* fo southern part of the Malay Peninsula, yellower and less ochraceous, rather less blackened above, with the nape stripe less intense and distinct. The colouring of the undersurface, though a little paler, is disposed as in *fulviventer* and about the same proportion have the white of the chest similarly separated from that of the abdomen. It appears necessary to recognise it as distinct from *fulviventer* though series for series, it is not a strongly marked race. Some animals are very different, however.

Originally described from Trang, Peninsular Siam, the known range is from Perlis (on the west coast), north to

Bandon. Three examples from Patani, on the east coast of the Peninsula in the same latitude as Perlis, are intermediatee though rather duller than *fulviventer* they have the nape stripes equally pronounced: with these should probably be associated animals from Patani recorded by Bonhote as *Tragulus javanicus* (P.Z.S. 1903, p. 883); Biserat and Bukit Besar) and others as *Tragulus kanchil affinis*. (Fasciculi Malayenses, Zool. I, 1903, p. 42: Jalor): otherwise the synonomy probably includes all references to examples from the range given above.

When describing *ravus* Miller stated that it was distinguishable from *T. k. kanchil* of Sumatra by its pallid colouration (l. c. s., p. 174). The same difference distinguishes it from *fulviventer* and I regret that I am not in a position to compare *fulviventer* with *kanchil* of which we have no specimens.

Habitat:—As above and Pulau Lontar, Coast of Trang

Specimens examined:—Seventeen.

TRAGULUS KANCHIL RAVULUS.

Tragulus javanicus, Miller (partim), Proc. Biol. Soc. Washington, XIII, 1900, p. 192.

Tragulus ravulus, Miller, op. cit. XVI, 1903, p. 41.

T. k. ravulus differs from *T. k. ravus* in being paler, i.e., yellower (especially the thighs) and less blackened above. Below, the neck markings are decidedly lighter with less admixture of black and there is less tendency for the yellow element to extend over the body.

Habitat and Specimens examined:— Four from Pulau Adang (typical locality), and five from Pulau Rawi, Butang Ids.

TRAGULUS KANCHIL ANGUSTIAE, subsp. nov.

Tragulus kanchil ravus, Wroughton, Journ. Bombay, Nat. Hist. Soc. XXIII, 1915, p. 717 (S. Tenasserim); Kloss, Journ. Nat. Hist. Soc. Siam, II, 1916, p. 29 (Pativu).

Type:—Adult male (skin and skull). Collected at Bankachon, Victoria Point, South Tenasserim, on 15th December, 1916, by G. C. Shortridge. Original No. 4513 of the Bombay Natural History Society's Mammal Survey.

Diagnosis:—Colour as in *T. k. ravus* of Trang, but nape stripe well defined and withers darker, as in *fulviventer*. The type and a second specimen have the white of the breast separated from that of the abdomen by a Y-shaped fulvous extension from the sides.

Measurements:—Head and body, 460; tail, 73; hindfoot, 127; ear, 36. Skull: greatest length, 94.5; condylo-basal length, 88; upper molar row (alveoli), 32; greatest breadth, 44 mm.

Specimens examined:—Four from the typical locality and one from Maprit, Pativu, S.W. Siam, in the same latitude.

Remarks.—The Lesser Mouse-deer has been recorded as far north in Burma as Mergui Tenasserim (vide Blyth, P.Z.S. 1864, p. 483), to which point the present form probably extends. Specimens obtained by Gyldenstolpe at Hat Sanuk in S.W. Siam, near the Tenasserim boundary (about 11° 45' N. lat.) are probably the same also (vide *T. k. affinis* Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl. 57, No. 2, p. 52, 1917).

TRAGULUS KANCHIL AFFINIS.

Tragulus affinis, Gray, P. Z. S. 1861, p. 137 (Cambodia).

Tragulus javanicus, Flower, P. Z. S. 1900, p. 374 (Dong Phya Fai, Siam).

Tragulus kanchil pierrei, Bonhote, Ann. and Mag., XI, 1903, p. 293 (Cochin-China); Lydekker, Cat. Ungulates, Brit. Mus. 1915, p. 291 (Pechabun in Siam, Cambodia, Cochin-China)[1].

Tragulus kanchil affinis, Bonhote, P. Z. S. 1907, I, p. 11 (South Annam); Kloss, P. Z. S. 1916, p. 63 (S. E. Siam), id., Journ. Nat. Hist. Soc. Siam II, 1916, p. 86 (S. E. and E. Siam).

This race differs from *angustiae* and *ravus* in being still duller with the nape stripe obsolete or entirely absent: it most nearly resembles *ravus* but is yellower on the neck and limbs and the mingling of colours on the upper parts of the body is more noticeable in the form of annulations. Where it meets the Burmese and Peninsular form is not yet ascertained but I have specimens from the range of mountains between Ayuthia and Korat.

Habitat:—South Annam, Cochin-China, Cambodia and Siam.

Specimens examined:—Five.

TRAGULUS KANCHIL WILLIAMSONI.

Tragulus kanchil williamsoni, Kloss, Journ. Nat. Hist. Soc. Siam, II, 1916, p. 88.

Like *affinis* but larger and with the upper-parts deeper ochraceous and only moderately annulated with brown (hind-foot, c. u., 125; greatest length of skull 103 mm).

Specimens examined:—The type from Muang Pre, North Siam, which is the most northerly example known of the Lesser Mouse-deer.

TRAGULUS KANCHIL HOSEI.

Tragulus kanchil hosei, Bonhote, Ann. and Mag., XI, 1903, p. 292; Lydekker, Cat. Ung. Brit. Mus., IV, 1915, p. 290.

Tragulus virgicollis, Miller, Proc. Biol. Soc. Washington XIII, 1903, p. 37.

[1] *Tragulus kanchil* [illegible] Lydekker [illegible] species made up of a number of [illegible] from the Malay States north to Tenasserim and thence through Siam to S. Annam.

The only specimen available (from Paku Saribas, Sarawak), is both paler and darker than any Malayan race; the upper parts having the fulvous element much more buffy and the blackish clouding much heavier and extending over the head, neck, hind-limbs and tail: only the proximal parts of the fore-legs are clear ochraceous orange and the hind-legs are only very slightly tinged with Sudan brown. Cheeks pale buffy, top of head blackish-brown, nape stripe broad and black: neck-chevron like the sides of neck but more blackened, collar like the sides of neck but less blackened; a median ochraceous patch on the abdomen joined to the collar by a narrow line; remaining underparts white.

This example is not typical as it differs from those described by Bonhote (Baram River, N. Sarawak), and Miller (Mt. Dulit, 3,000 feet, N. Sarawak), in having the neck grizzled with black, not clear coloured.

(The only other known continental form of the genus *Tragulus* (s.s.) is *Tragulus versicolor* of South Annam (Thomas, Ann. & Mag. V, 1910, p. 535). It is regarded by Lydekker as a subspecies of *javanicus* (Cat. Ung. Brit, Mus., IV, 1915, p. 280) but is an animal of very distinct characters—larger than *kanchil*, smaller than *javanicus*; anterior half of body fulvous, posterior grey; these colours meeting abruptly behind the shoulders. In the present state of our knowledge it is of very isolated occurrence for no napu has yet been recorded from the region between Tenasserim and Annam.

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