

ON A THIRD COLLECTION OF SIAMESE MAMMALS.

BY C. BODEN KLOSS, F. Z. S.

The specimens on which the present paper is based were sent me by H. R. H. Prince Abhakara of Chumporn and Messrs Aagaard, Eisenhofer, Elwes, Gairdner, Irwin, Wedderburn and Yates; also by Messrs Williamson and Smith who as usual are responsible, through their collectors, for the largest number.

Patani, from which some of the material comes, though politically part of Siam, both geographically and zoologically belongs to the Malayan sub-region and is lacking in true Indo-Chinese species, while many species occur in it which have not been found north of the Isthmus of Kra; these, which are purely Malayan, I have marked with an asterisk.

I am much indebted to the above members of the Society for the opportunity of examining their specimens.

1. *Presbytis obscura flavicauda*.

Pygathrix flavicauda Elliot, Proc. U. S. Nat. Mus., 38, p. 352 (1910)

Presbytis obscura flavicauda Kloss antea, p. 5.

1 ♂ ad. Bang Nara, Patani, Peninsular Siam. 9 July 1916 [No. 2476].

1 ♂ imm., 1 ♀ ad. Pak Nam Chumporn, S. W. Siam.¹ 11 July 1917 [Nos. 2565-6].

All obtained by Messrs Williamson and Smith's collectors.

The Patani specimen lacks the buffy tinge on the cap of the Leaf-Monkeys from Tung Sawng, Nakon Sri Tamarat, previously described, and its hind limbs and tail are a trifle paler.

One of the Chumporn animals agrees with it but the other has the hinderparts a trifle paler still: it is however unquestionably referable to the Trang race and not to *P. o. smithi* of Patiyu (antea p. 5).

For measurements see p. 289.

¹ I have followed Dr. Malcolm Smith (antea, p. 49) in using the term S. W. Siam for the country between the Petchaburi River and the Isthmus of Kra: this area formed the southern and northern extremes respectively of Western and Peninsular Siam as defined in my note on zoogeographical divisions (vol. I, p. 250 and Map) where they were given too great a range of latitude.

2. *Macaca irus*.*Macacus irus* F. Cuv., Mem. Mus. Hist. Nat. Paris, iv., p. 120 (1818).*Macaca irus* Kloss, P. Z. S. 1916, p. 31.2 ♀ ad. Pak Klong¹ Pran, S. W. Siam. 28 June 1917 [Nos. 2545-6].1 ♂ subad., 1 ♀ ad. Pak Nam¹ Chumporn, S. W. Siam. 7 July 1917 [Nos. 2563-4].

All obtained by Messrs Williamson and Smith's collectors.

These Macaques are all dull-coloured animals lacking any bright ochraceous tone in the upper parts, where the yellow element is buff. The Pran animals are rather greyish, the others rather brownish; and the latter have a blackish area extending from the forehead to crown: the top of the head in the Pran specimens is like the back, and as both phases of colour occur with intermediates in animals taken by Mr. Shortridge near Tenasserim Town the differences are evidently only due to individual variation.

Measurements of Siamese Monkeys in Millimetres.

Collector's external measurements:—				<i>Presbytis</i>		<i>Macaca</i>		
				♂	♀	♀	♀	♀
No.	...	...	...	2476	2566	2545	2546	2563
Head and body	...	...	...	572	534	458	435	430
Tail	...	...	...	770	660	495	425	490
Hind-foot S.U.	...	...	...	172	155	133	114	125
Skull:—								
Greatest length	...	...	...	106	100	109	106	113
Basal length	...	...	...	76	71	78	74	77
Zygomatic breadth	...	...	...	80	73.5	73.5	73	45
Maxillary tooth-row exclusive of incisors (alveoli)...				34	33	38	35.5	36.5

3. *Nycticebus cinereus* M-Edw.

Kloss, antea, p. 76.

1 ♂ ad. Koh Lak, S. W. Siam. Oct 1916. [No. 2464].

This Slow Lemur differs from the very pale example from Koh Lak which I previously described in being generally ochraceous-tawny above, rather deeper on the shoulders and paler on the hind-limbs;

¹ Pak Klong, Pak Nam=Mouth of River.

with the head, nape, fore-limbs to elbow, and hind-feet whitish. The eyes are surrounded by large, dark brown patches and the nape-stripe, which is amber brown, divides on the crown into four branches which run to the eye-patches and the ears. Behind the shoulders the stripe is brownish-black but ceases at the middle of the rump. The lower parts are greyish-white, slightly tinged with ochraceous.

The former specimen is older and this may account for the predominance of whitish-grey in its colour.

Measurements:—head and body, 277; tail, 20; hindfoot, 69; ear, 26.

Skull:—greatest length, 62; basal length, 50; zygomatic breadth, 40; width of braincase above roots of zygomata, 32; maxillary tooth-row exclusive of incisors (alveoli), 21.2; mandibular length, 39.2; distance between ridges on cranium, 4 mm.

4. *Felis rebulosa* Griffith.

Flower, P. Z. S., 1900, p. 324.

Flat skin with skull of a Clouded Leopard obtained near Chiengmai by Mr. H. C. St. J. Yates [No. 2576].

This is a fine adult example with pronounced sagittal and occipital ridges; though the teeth are scarcely worn both a canine and a posterior molar are considerably chipped, showing that it must have fed on large-boned animals: pm^1 is present. The species has a large range, occurring from Sikkim and Formosa southward to Java.

The general colour is a deep buff with the lower parts and inner sides of the limbs white: the areas on the upper parts which are more or less surrounded by black borders, broadest posteriorly, frequently contain dusky spots and are darker than the reticulations as the hairs have dusky bases. Interrupted black lines run from crown to tail and the limbs and underparts exhibit large black spots.

Skull: greatest length, 194; condylo-basilar length, 172; tip of premaxillaries to back of palate, 78; upper tooth row excluding incisors (alveoli), 63.5; length of canine in front from alveolus, 42; greatest length of upper sectorial (and also transverse length), 21.3; pm^3 — pm^3 (alveoli), 38; breadth of muzzle above canines, 49; interorbital breadth, 33; zygomatic breadth, 122; mastoid breadth, 73; front of foramen

magnum to extremity of occipital crest, 54 ; greatest length of mandible, 132 ; lower cheek-teeth (alveoli) 41 mm.

These dimensions slightly exceed those given by Blanford of a skull from Assam "larger than usual" (Fauna Brit. Ind. Mamm., p. 73).

5. *Felis temmincki* Vig. & Horsf.

Kloss, *antea*, p. 79.

1 ♂ ad., Chiangmai, North Siam, 800 ft. 14 March 1916. Collected by Mr. K. G. Gairdner [No. 2605].

This is the specimen of which Mr Gairdner has already given some account on p. 251 : though adult it is not aged and would probably have grown larger if it had lived longer. The species was described from Sumatran material and Hodgson independently described a Nepal specimen and named it *F. moormensis*. Northern animals are not infrequently larger than their equatorial representatives and if the Himalayan animal is different it will be known as *F. t. moormensis* but a distinction on size should not be made until good series from various districts have been compared, and unfortunately topotypes are very rare.

I have received some interesting notes from Mr. H. C. St. J. Yates who obtained the skin recorded on p. 79. Mr. Gairdner says that this animal is alleged to be very fierce and a match for the tiger but Mr. Yates notes that one was shot after being treed by a pariah dog : reputation and behaviour are not reconcilable and the latter is more worthy of credence as the animal is not even a leopard but only a large cat. Mr. Yates writes, "Local properties assigned are :—

It is the master of all other tiger-cats and leopards.

If its fur is burnt by a bullock caravan when a tiger is near the tiger is scared away.

If it is cooked, skin, fur and all (and eaten), it acts as a protection to a man against attack of any beast.

It is said that the strength of the animal lies in its jaw which is out of all proportion to the body (the jaw is really of normal size). Once it has hold it never looses its grip and always fastens on to the throat. The following instance was given : a villager and his dog met a "süah fai" and the dog went for the cat which fixed on the other's throat and was only taken off after it had been shot."

6. *Viverra zibetha pruinosa* Wroughton.

Journ. Bombay N. H. Soc., XXIV, p. 164 (1915).

Viverra zibetha Kloss, Journ. Straits Branch R. A. Soc., No. 53, p. 18 (1909).

1 ♀ ad. Bang Nara, Patani, Peninsular Siam. 16 July 1916.
Messrs. Williamson and Smith's collectors. [No. 2477].

Wroughton has separated the Marbled Civet of the Shan States, Tenasserim and the Malay Peninsula from the Indian animal on account of total absence of any yellow tinge in the ground colour of the fur, the tips of the hairs being white, not buffy, so that the general colour is pale grey with black markings.

Mr. C. J. Aagaard has sent me, also from Bang Nara, a skull said to be that of *V. z. pruinosa*; it is much larger than the other and is probably that of a male (measurements in parentheses).

Head and body, 818; tail, 435; hind-foot, s.u., 121; ear, 51.

Skull: greatest length, 142 (155); basal length, 130 (142); zygomatic breadth, 67.5 (73); breadth of braincase, 39 (43.5); maxillary tooth-row exclusive of incisors (alveoli), 53 (63); greatest length of upper sectorial, 14.7 (15.5).

7. *Paradoxurus hermaphroditus rarus*.

Paradoxurus rarus, Miller, Smithsonian Miscellaneous Collections: Vol. 61, No. 21, p. 2 (1913).

Paradoxurus hermaphroditus, Gyldenstolpe, Kungl. Sv. Vet. Akad. Handl., 57, No. 2, p. 25, plate iv, figs. 1 & 3, (1917).

Paradoxurus hermaphroditus rarus, Gyldenstolpe, op. cit., p. 25.

1 ♀ juv. Central Siam. 1916 [No. 2500].

1 ♀ imm. Pak Nam Chumporn, S. W. Siam. 11 July 1917
[No. 2652].

1 ♀ young ad. Bang Nara, Patani, Peninsular Siam. 12 July 1916 [No. 2478].

The first of these Palm-Civets was sent me by H. R. H. the Prince of Chumporn and the others by Messrs. Williamson and Smith.

I have recorded them under Miller's name because on the whole they are greyer, with less of a yellowish-brown tinge in the ground colour, than animals of the Malay States which are typical *hermaphroditus*.

At the same time it may be noted that the race is not a very distinct one and (after examination of a series of palm-civets ranging

from Siam to Selangor) the best to be said of it is that the dark markings are blacker while the grey animals are greyer and the buffy examples much less buffy or brownish than any of the Southern animals. Of *P. h. hermaphroditus* immature examples are the most richly coloured, some being suffused with ochraceous; but I have taken no account of them in my comparison.

The form *ravus* extends northwards from Perlis and Patani but North Siam animals have been named *P. h. laotum* by Gyldenstolpe (op. cit. p. 26, p. iv, figs. 2 and 4) on account of supposed greater size.

Measurements of No. 2478. Head and body, 527; tail, 529; hind-foot, s. u., 81. Skull: greatest length, 102; basal length, 97.5; zygomatic breadth, 54; maxillary tooth-row exclusive of incisors (alveoli), 38 mm.

8. *Arctictis binturong binturong*.

Viverra? binturong Raffles. Trans. Linn. Soc., xiii, p. 253 (1821).

1 ♂ ad. Bang Nara, Patani, Peninsular Siam. Mr. C. J. Aagaard. [No 2574].

Colour black; head grizzled with white; limbs and, to a less degree, the upper parts of the body grizzled with buffy; median line of the undersurface grizzled with ochraceous; anal region and base of tail buffy, rest of tail black. Ears fringed with buffy and with long black tips. Vibrissae black and white.

Total length (nose to tail tip) 1677 mm. (5ft. 6in).

Skull: greatest length, 146; condylo-basal length, 144; zygomatic breadth, 86; nasals, mesial length, 26, breadth at middle, 12.5; interorbital breadth, 37; tip to tip of postorbital processes, 54; breadth immediately behind the latter, 46; breadth at fronto-parietal suture, 41; greatest posterior breadth on ridges, 60; height of crown from posterior palate, 47.5; palatal length, 77; breadth of posterior palate, 20.5; maxillary tooth-row exclusive of incisors (alveoli), 46; mandibular tooth-row, 57.

Having compared a skull (presumably male) of a Bear-Cat from Sai Yoke, W. Siam, with a male skull from Perak, Malay States; Thomas decided that the former represented a distinct form which he named *Arctictis gairdneri* (Ann. and Mag. (8), xvii, p. 270) on account of larger size (greatest length of skull 153 mm) and differences in the

characters. The skull was that of an aged individual ("crests greatly developed, teeth much worn down") which might account for the dimensions.

The type of *A. binturong* came from Malacca and females from the neighbourhood have skull lengths of 145 and 146 mm, while Lyon records a male from East Sumatra with a skull length of 145 mm. (Proc. U. S. Nat Mus., xxxiv, p. 651, 1908) and none of these appear to be as old as the Sai Yoke specimen.

Lyon has also drawn attention to the variation in characters and size which are shown by skulls from one district, features which are confirmed by Malayan animals. The difference in length between the skulls of *A. gairdneri* and the specimens mentioned above (less than one-third of an inch) cannot be considered of much importance in such an animal and, while none of the southern examples are old, Mr. Gairdner seems to have been fortunate in securing an aged individual.

The principal difference between the Sai Yoke and Malayan animals appears to be in breadth of skull and the latter may develop this character in old age; in *Paradoxurus* the skulls of aged animals are much broader than those which are merely fully adult and it may be that the case is the same with *Arctictis*: other features, such as parallel-sided nasals and vaulted skull occur in topotypes and the bullae are also very variable.

I agree with Lyon that the grizzled and grey phase is not entirely characteristic of the young; at the same time it is much more frequent and profuse in them than in adults. Among a series of Malayan specimens there are two from Selangor of exactly the same age; one of them is the most completely black of all and the other is as grizzled as any of the juveniles, which are much more grizzled than the oldest animals: the hair-tips of the former are markedly ochraceous and it seems doubtful whether Lyon was justified in describing *A. niasense* (op. cit., Vol. 52, p. 443; 1916) from a flat skin of which the age is unknown: the measurements given indicate a small, and probably young, animal.

Owing to their habits, largely nocturnal and arboreal, the Bear-cat is not easily obtained and at present is represented in collections by inadequate series.

9. *Cyon javanicus*.

Canis javanicus, Desm. Mamm., p. 193 ; 1820 (Java).

Canis familiaris var. *sumatrensis*, Hardwicke, Trans. Linn. Soc., xiii, p. 235, pl. 23 ; May 1821 (Sumatra).

Canis rutilans, S. Müll. in Temminck's Verhandelingen, Zoologie, Inleiding, pp. 27, 51 ; 1839-44 (Java).

1 ♀ ad. Bang Nara, Patani, Peninsular Siam, 28 July 1916. Messrs. Williamson and Smith's collectors [No. 2479].

General colour rufous (Sanford's brown), many of the hairs on head, neck and back black-tipped. Innerside of ears, upper lip, chin and throat, chest and abdomen and inner side of thighs whitish : a rufous collar between throat and chest, the middle part of the under-body tinged with rufous. Inner sides of fore-limbs whitish, this colour extending somewhat over the upper sides of the feet ; inner side of hind-limbs speckled with whitish which extends over the inner upper surface of the feet. Tail rufous proximally but blackened above and white at the base ; terminal half black, the hairs dull rufous at their bases. Feet with long hair between the paws.

Head and body 896 ; tail 332.

Skull : greatest length, 180 ; basal length, 158 ; zygomatic breadth, 100.5 ; maxillary tooth-row exclusive of incisors (alveoli), 73 ; greatest length of upper sectorial, 19.8.

Near Korat last year I nearly trod on a solitary Wild Dog that was lying in a patch of long grass.

10. *Martes flavigula indochinensis*.

Kloss, P. Z. S., 1916, p. 35.

1 ♀ ad. (teeth unworn), Lat Bua Kao, E. Siam. 15 Sept. 1916. Mr. W. J. F. Williamson's collector [No. 2470].

This example of the Siamese Marten is rather younger and smaller than the type, also a female, which came from Klong Menao, S. E. Siam, and its colours are rather more intense throughout. The differences are such as might be due to age or individual variation.

Entire upper surface of head and anterior part of nape, back of ears, hind-feet and base of tail blackish-brown ; tail black, the hairs with brown bases ; distal half of fore-limbs, thighs and rump bistre, these colours gradually changing into bright buff-yellow on the shoul-

ders and warm buff on the lower back and flanks; median dorsal line from mid-back to tail a variable bistre; sides of neck between ears to shoulders apricot yellow; sides of upper lip, chin and throat white blending with the yellow of the neck; rest of the under-surface chamois. Areas below eyes and upper-side of forelimbs proximally grizzled white and bistre; ears bistre, their edges and centre whitish.

External measurements:—head and body, 472; tail, 357; hind-feet, s. u., 88; ear 35.

Skull:—greatest length, 86; basal length, 79; upper tooth-row excluding incisors (alveoli), 26.5; greatest diameter of m^1 , 8.0; least palatal breadth between carnassials, 14.6; least interorbital breadth, 19; breadth at postorbital constriction, 22; zygomatic breadth 50.5.

11. *Arctonyx collaris dictator*.

Arctonyx collaris, Kloss, Journ. Straits. Branch R. A. Soc., No. 53 p. 32 (1909); Gairdner, Journ. N. H. Soc. Siam, 1, p. 253 (1915).
Arctonyx dictator, Thomas, Ann & Mag. Nat. Hist. (8), V, p. 424 (1910); Kloss, antea p. 8.

1 juv. near Sisophon, S. E. Siam. H. R. H. the Prince of Chum-porn. [No. 2465].

This Hog-badger, which seems to be the first specimen of an *Arctonyx* taken east of the Menam, died in captivity and is unfortunately very cage-worn and young.

It is a little larger and older than a young animal from Nakon Sritamarat (antea p. 8) having just got rid of all its milk teeth. Greatest upper length of skull, 129; zygomatic breadth, 60.8; greatest diameter of m^1 , 16.6, of pm^1 , 19 mm.

Arctonyx dictator still really rests on the type, an old female from Trang, Peninsular Siam, much larger than any known examples of *collaris* of Assam and Burma or *hoeveni* of Sumatra: it does not seem to be more than a large race of the former and that such should occur between two smaller forms is rather unusual. Badgers are reported in the Malay Peninsula as far south as Upper Perak where they are known as "Sabima".

12. *Ursus tibetanus* subsp.

Ursus tibetanus, F. Cuv., Hist. Nat. Mamm., pl. 213 (1824).
Ursus torquatus, Blanford, Lydekker, Wroughton et auct.

Flat skin with skull (immature) from near Sisophon, S. E. Siam H. R. H. the Prince of Chumporn [No. 2501].

Gyldenstolpe has recorded this species of Bear from North Siam but, I believe, erroneously. The evidence advanced is the photograph of a young animal which appears to be unquestionably only an example of the common short-haired bear *Ursus malayanus* (Kungl. Sv. Akad. Handl., 57, No. 2, p. 21, pl. 2, figs 1, 2; 1917).

The present specimen is thus apparently the first of its kind met with south of China and east of Tenasserim. It appears to be very typical as far as the pelage is concerned with long wavy hair, fringed ears, whitish muzzle and small gorget. The permanent teeth are all in place but the animal is quite young with faintly marked ridges on the cranium about 55 mm. apart at the fronto-parietal sutures.

The skull is imperfect but the greatest upper length on the median line is 202 mm., zygomatic breadth 115 mm.; and breadth of palate between the last molars 30 mm.; though it has the elongate shape of *U. tibetanus* (as figured by Lydekker under the name of *U. torquatus* in P. Z. S. 1909, pp. 607-10, text figure 186-7*) it would certainly have broadened relatively with age. The teeth most nearly resemble those of *U. t. macneilli* Lydekker (loc. cit †), but the three upper anterior premolars are rather crowded (more than in Lydekker's figure of "*torquatus*") the 2nd and 3rd being outside the median line of the tooth-row; and the length of the six upper cheek-teeth together is only 68 mm. against 99 mm.

The measurements of the posterior teeth (and those of the type of *macneilli*) are :—

	Type of <i>macneilli</i> .	Cambodian specimen.
Length of last 3 upper cheek-teeth	53.8	57.3
" " " upper molar	25.0	27.0
Width " " " "	15.1	15.5

* Note the following error regarding both figures: though the skulls are indicated by letters which agree with the text, in the legends attached for A read B and for B read A.

† Typical locality "some distance to the westward of Tachien" which is in Szechuan, long 102°20', lat. 30°5'; not "Assam" as stated by Wroughton in Journ. Bombay N. H. Soc., xxiv, p. 769 (1916).

Length of last 3 lower cheek-teeth	55.2	55.5
" " " lower molar	15.2	15.0
Width " " " "	10.6	11.3
Length of penultimate lower molar	20.1	20.0

Though the length of the last three upper molars is as in the type of *U. t. formosus* Swinh. the teeth are quite different in shape from those of that animal and the skull is very much narrower.

In the same article Lydekker gave some account of a female skull from Assam with teeth smaller than the type of *macneilli* (last 3 upper cheek-teeth 50.7 mm.) but because of the much wider palate in the former did not associate it with the new race; for he considered that in *macneilli* the palate of the female (as represented by a Szechuan skull) is relatively narrower than in the male (31.8 against 39.4 mm.), whereas the palate of the Assam female is considerably broader (45.7 mm.). The status of the latter form is left in doubt and that of the present animal must remain undecided until adult examples have been procured.

13. *Gymnura gymnura minor*.

Lyon, Proc. U. S. Nat. Mus., xxxvi, pls 34, fig. 1, and 35, fig. 1 (1909).

1 ♂ ad. Bang Nara, Patani, Peninsular Siam. 19 December 1916. Mr. C. J. Aagaard [No. 2573].

The race was defined differing from the typical animal of Sumatra in rather smaller size, but it is more markedly distinguished in the reduction of the whitish area of the back. The Southern form has the white-tipped hairs extending over more than three-fourths of the length of head and body with the whitened area ending broadly across the rump so that viewed from below numerous white tips are visible: the Northern race has the white-tipped hairs extending over less than two-thirds of the length of head and body with the whitened area ending in a point and not spreading over the sides, so that from below no white hairs can be seen: in the latter form also the pale terminal portion of the tail is generally shorter.

The animal is remarkable for the strong offensive odour which clings to the skin for years.

Hindfoot s. u., in dried skin, 57 mm.

Skull:—condylo-basal length, 80; basal length, 75; palatal length, 46.2; least breadth between penultimate molars, 13; zygomatic breadth, 38; upper tooth-row (alveoli), 44; p^3-m^3 (alveoli), 25; lower tooth-row (alveoli), 38; p_3-m_3 (alveoli), 24.5; mandible (to back of condyle), 60.4.

14. *Parascaptor leucera*.

Talpa leucera, Blyth, Journ. Asiat. Soc. Bengal, xix, p. 215, pl. iv, figs 1, 1 a (1850).

Parascaptor leucera, Dobson, Mon. Insectivora, pt. ii, p. 140, pl. xx, figs 9 and 9b (1883).

Skin from Doi Nga Chang, S. E. of Chiangmai, N. Siam, 4000 ft. Collected by Mr. Emil Eisenhofer.

Held crossways with the light falling from the front the colour appears as mouse grey strongly suffused with drab, the result being almost hair-brown; chin and throat tinged with light brown, chest less so: hands thinly clad with buffy, feet with greyish hairs.

End of snout and top of muzzle naked for about 8 mm., with a median depression: tail thicker at end than at base and bearing a number of pale greyish hairs, 17-18 mm. long.

Head and body, 125; tail, 8; hind-foot, 14.5; breadth of hands 13, length, including nails, 17 mm.

This Mole has not been met with hitherto Eastwards of the Sit-tang River, Burma, so the present specimen extends the range in that direction by a hundred and fifty miles.

Blanford* states "colour uniform brown in all the skins I have examined but described as black by Anderson †, perhaps variable." Of *Talpa micrura* he says ‡ "Uniform velvety black when fresh . . . dried skins often brown," so it may be that instead of being variable *P. leucera* also undergoes a change of colour after death.

15. *Galeopterus temmincki peninsulæ*.

Galeopterus peninsulæ, Thomas, Ann. & Mag. Nat. Hist. (8), ii, p. 303 (1908).

Galeopithecus volans, Auct.

* Fauna. Brit. Ind., Mamm. p. 227 (1888).

† Cat. Mamm. Ind. Mus., pt. 1, p. 170 (1881).

‡ op. cit., p. 225.

1 ♂ ad. Bang Nara, Peninsular Siam. 10 July 1916. Messrs. Williamson and Smith's collectors. [No. 2484].

Head and upper parts of various colour blending together—dull tawny, greyish buff, grey—vermiculated throughout with black; edge of the membrane Mars brown; face dull and dark; small white patches on the rump and a number of white spots on the hand, forelimbs and feet.

All males of the local Flying-lemur are more or less rufous above while the females are greyish; males are also smaller; female skull attaining a condyle-basilar length of 76, though the more usual size is 72 mm.

Native collector's external measurements: head and body, 370; tail, 259; hind-foot s. u., 69; ear, 24. Skull: greatest length, 71; condylo-basal length, 67.2; palatal length, 34.5; palatal breadth behind canine (alveoli), 21; least interorbital breadth, 17; external biorbital breadth, 45.2; zygomatic breadth, 43.1; maxillary tooth-row (alveoli), 33.9; maxillary molar series (alveoli), 18; greatest length of pm^2 or canine, 6.9.

16. *Cynopterus angulatus*.

Miller, Proc. Acad. Nat. Sci. Philadelphia, 1898, p. 316.

Cynopterus sphinx, Bonhote (partim), P. Z. S., 1900, p. 191; id., op. cit., 1902, ii, p. 38.

Cynopterus marginatus, Flower, P. Z. S. 1900, p. 340.

Cynopterus brachyotis angulatus, Anderson, Cat. Chir. B. M., 1, p. 611 (1912).

1 ♂ young adult. Pa Kok, Me Wang, North Siam, 1000 ft. 12 November 1915. Collected by Mr. K. G. Gairdner [No. 2504]

A rather dull-coloured example of Lesser Fruit-bat with the cranial ridge between three and four millimetres broad. It is as large as many specimens of *C. sphinx sphinx* but the distance from orbit to nares is less than a quarter of the length of the skull.

Measurements. Skull:—lambda to gnathion, 33.5; rostrum (orbit to nares), 7.5; mandible, 26.0; maxillary teeth, crowns, 11.4. Forearm, 69; 3rd digit, metacarpal, 45.4; 3rd digit, 1st phalanx, 30; tibia 25 mm.

17. *Emballonura monticola* Temminck.

Emballonura monticola, Thomas in Wroughton, Journ. Bombay N.H.

Soc., xxiii, p. 706, (1915); id., Journ. F. M. S. Mus., vi, p. 4 (1916).

Emballonura peninsulae, Miller, Proc. Acad. Nat. Sci. Philadelphia, (1898), p. 323.

2 ♂. Bang Nara, Patani, Peninsular Siam, July 1916. Messrs. Williamson and Smith's collectors [Nos. 2590-1].

These specimen are badly smashed but the forearms have lengths of 40 and 44.8 mm.

18 *Scotophilus belangeri*.

Is. Geoffr., Belang. Voy. aux Indes. orient., 1834, p. 87, 92, pl. 3.

1 ♂ in spirit, Bangkok, Siam, June 1917. Collected by Dr. Malcolm Smith [No. 2611].

Colour (dried from spirit) above fuscous, below olive buff (Ridgway).

Head and body 76; tail, 56; hind-foot s. u., 12; ear, 17; forearm, 58, tibia, 22.

S. belangeri has a forearm of 58 mm. and though I have no other information about it I believe it came from Burma so place this specimen under the name.

19. *Hipposideros diadema vicarius*.

Andersen, Ann. and Mag. Nat Hist, (7) xvi, p. 499, 597 (1905).

1 ♂ ad., skin and skull; 1 ♀ ad., spirit specimen. Bang Nara, Patani, Peninsular Siam. 4 July and 10 Aug. 1916. Messrs. Williamson and Smith's collectors. [Nos 2485, 2589].

The description of *H. d. vicarius* seems to fit these specimens and as they come from a region between Borneo and Sumatra, in both of which that race occurs, they may be considered members of it.

The posterior nose-leaf is clearly divided into four cells.

Colour of skin specimen:—head and neck whitish tinged with cinnamon brown; back cinnamon brown with a white spot below the shoulders and an elongate white patch bordering the membrane on each side; forearm thinly clad with ochraceous hairs. Undersurface drab, pale and greyish on the foreneck; upper arms whitish.

Measurements: head and body, 93 (87*); tail, 48 (54); hind-foot, s. u., 12 (12.7); ear, 30 (29). Forearm 81.2 (84); third

* Measurements in parentheses those of the female.

metacarpal, 62, (63.5); tibia (32.5). Skull: greatest length, 31.4; anteorbital breadth, 9.5; upper teeth (front of canine to back of molar), 12.9.

20. *Petaurista lylei*.

Bonhote, P. Z. S., 1900, p. 192, pl. xiii; id., op. cit., 1901, p. 53.

Flat skin of a male from 90 miles north of Muang Pre, N. Siam. Collected by Mr. C. C. Wedderburn. May 1917 [No. 2575].

The head and back and much of the upperside of the limbs are covered with hair blackish to greyish at the base, then chestnut or brown succeeded by a white annulation and a black tip—the general colour effect from a distance being grey. The limbs and membranes are covered above with hair blackish at the base, rufous or ferruginous at the tip.

The hands and feet are black and the membranes near the limbs are edged with the same colour, sometimes mixed with brownish; the middle portion of the parachute is bordered with dark brown grizzled with whitish.

The forelimbs are black beneath but the rest of the underparts is of a colour intermediate between tawny and burnt sienna, deepening to rich ferruginous on the hind-limbs and near the edges of the membranes and mixed with white on the median line and the extreme base of the tail.

The distal half of the tail is black but on the basal portion only the tips of the hairs are black, their bases being dark brown and the middle portions greyish to ochraceous.

The eyes are narrowly ringed with black bordered above and below with ferruginous and the muzzle appears to the dark brown.

The outer sides of the ears are black, rather grizzled towards the tips where the edges are ochraceous-orange. The backs are anteriorly (proectote) and at tips covered with short ochraceous-orange hairs; posteriorly and basally (metectote) they are clad with long black hair which is continued along the sides of the neck to form a broad elongate patch.

*P. l. vanningi** of the South Shan States differs in having no ferruginous colour in the concealed underfur of the back, the proectote

* Thomas, Journ Bombay N. H. Soc., xxiii. p. 26 (1914).

duller and more of a fawn colour and no rufous spots above the eye; it is more brownish below (fawn coloured) and the parachute is darker throughout.

P. a. barroni of Central and S. E. Siam (antea, pp. 33,81) is altogether a paler animal though less markedly grey above; it has membranes brighter and much less black-edged, white patches on the shoulders and the front of the membrane adjacent bright ferruginous, the proectote whitish, and only the last three or four inches of the tail black.

An example of Barron's Flying Squirrel was kept for some time by Dr. Malcolm Smith in his house where it was given complete freedom: it made a charming pet though it slept for the greater part of the day. We noticed with interest that the principal use of the calcaneum, or bony spur, attached to the outer side of the wrist was to fold up and support the parachute when the animal was running and leaping about: without this provision for tucking away the membrane the squirrel would apparently be unable to walk for tripping over itself. Mr. R. W. G. Hingston who has given a long account of "the attitudes and movements of the large red flying squirrel *Petaurista inornatus*" does not seem to have remarked this.†

21. *Petaurista petaurista melanotus*

Pteromys melanotus Gray, Mag. Nat. Hist., New Series, i, p. 584, (1837)

Petaurista nitida melanotus Thomas, Ann. and Mag. Nat. Hist., (8) i, p. 250 (1908).

1 ♀ ad., Bang Nara, Patani, Peninsular Siam. 14 Aug. 1916. Messrs. Williamson and Smith's collectors (No. 2497).

This race of the Large Red Flying-squirrel differs principally from *P. p. cicur* (antea, p. 14) in having the black-tipped hairs much reduced in number. The specimen is rufous (burnt sienna) above and the black tips are confined to the middle line of the shoulders and back.

Collectors' external measurements: head and body, 425; tail, 505; hind-foot, s. u., 73; ear, 43.

Skull: greatest length, 72; condylo-basilar length, 62.2; pala-

† Journ. Bombay N. H. Soc., xxiii, p. 344 (1914).

tilar length, 33; diastema, 14.8; upper tooth-row (alveoli) 18; greatest length of nasals, 21.2; greatest breadth of nasals, 12.3; inter-orbital breadth, 16; width between tips of postorbital processes, 36.3; zygomatic breadth, 47.

22. *Petinomys phipsoni*.

Pteromys (*Petinomys*) *phipsoni*, Thomas, Journ. Bombay Nat. Hist. Soc., XXIV, p. 432 (1916). (Tenasserim Town.)

Petinomys vordermanni, Kloss, Journ. Fed. Malay States Museums, VI, p. 251 (1916).

1 ♂ ad. Bang Nara, Patani, Peninsular Siam. Mr. C. J. Aagaard [No. 2577.].

1 ♀ ad., 1 ♂ juv., 1 ♀ juv. Same locality. 9 July 1916. Dr. Malcolm Smith's collector [No. 2472, 2601-2].

Colour. Above blackish (bases of the hairs blackish-slate) washed with fulvous to cinnamon, most strongly on the posterior dorsal line and rump where the tips are cinnamon; sides of neck strongly buffy; limbs and parachute darkest, black only slightly grizzled with fulvous. A ring round the eye and a line running thence to the extremity of the muzzle black. Cheeks and sides of throat capucine orange.

Undersurface of body and limbs and a sharply margined median area on the throat white, the hind-limbs tinged with fulvous: under-surface of parachute brownish black grizzled with pale yellow orange; edges of parachute yellow orange; edges of interfemoral membrane ochraceous-orange.

Bases of the ears with tufts of black hair a little longer than the ears themselves. Hands and feet dark brown above edged with pale ochraceous-buffy; inner sides of forelimbs buffy. Tail above very bushy and scarcely distichous, dark brown, the hairs tipped with fulvous which is in excess at the base: below the distichous portion of similar colour, but the base paler and the median line fulvous.

The above description is taken from the female which was discovered in a hole in a tree with two young animals having the eyes still unopened. They are much brighter in colour than the parent, being cinnamon brown above with little trace of black, and the membranes are largely naked. The most interesting difference is in the tail

where the hair is short and points towards the tip instead of having the distichous arrangement of the adult.

The adult male, which has been in spirit, generally agrees with the adult female but has the head like the rump and lacks the long black hair behind the ears.

Both the small anterior premolars are absent in the female and Mr. Oldfield Thomas, to whom I sent it for inspection, writes me that it is his *P. phipsoni*: I think there is no doubt, however, that when continental specimens have been compared with topotypes of *P. vordermanni* (Jentink) of Billiton Island we shall have to regard this flying-squirrel as merely a local race of that animal.

Measurements of male and female respectively:—Head and body, 111, 120*; tail, 104, 110*; hindfoot, s.u. 23, 21*; ear, 14, 18* (13?).

Skull:—greatest length, 31.1, 31.0; condylo-basilar length 27.0, 26.5; basilar length, 25.5, 24.2; palatilar length, 13.1, 12.7; diastema, 6.2, 6.3; upper tooth-row (alveoli), 6.0, 5.9; median nasal length, 7.6, 6.7; greatest nasal length, 7.6, 7.2; greatest breadth of nasals, 4.5, 4.4; interorbital breadth, 6.2, 6.7; cranial breadth, 17.5, 17.0; zygomatic breadth 18.3, 18.0.

23. *Ratufa melanopepla peninsulæ*.

Miller, Smithsonian Miscellaneous Collections, 61, p. 25 (1913).

1 ♂ ad. Bang Nara, Patani, Peninsular Siam. 5 July 1916.
Messrs. Williamson and Smith's collectors [No. 2486].

Pelage much abraded and "bleached" brownish above.

For measurements see p. 312.

24. *Ratufa melanopepla phaeopepla*.

Ratufa phaeopepla, Miller, Smithsonian Miscellaneous Collections, 61, p. 25 (1913); Kloss, *antea*, p. 81

Two flat skins from Sai Yoke District above Kanburi, W. Siam. January 1917. Collected by Mr. A. J. Irwin. [Nos. 2569-70].

Colour brownish above.

* By native collector.

25. *Ratufa melanopepla leucogenys*.

Kloss, P. Z. S., 1916, 43; id., *antea*, p. 15.

1 ♀ ad. Nong Kha near Sriracha, S. E. Siam. 14 July 1917.
Mr. W. J. F. Williamson's collector [No. 2499].

This is the only example of a *Ratufa* taken in Siam and Tenasserim during the hot and rainy season that I have seen, for these localities are generally visited by collectors in the winter months when the weather is cool and dry.

It is pure black above except for a slightly indicated brownish patch on the nape, and for the whole of the rump and a great part of the tail which are chestnut brown: the pelage having the latter colour is old and abraded while the rest is quite fresh.

This suggests the question whether the brown colour of *phaeopepla* is constant or is only a dry season phase: *leucogenys*, however, from similar latitudes, is blackish in the dry season.

Ratufa phaeopepla is stated to have a skull length of 74-78 mm in full grown animals, whereas typical *leucogenys* is apparently smaller agreeing with *peninsulae* in a skull of about 73 mm or less: the present specimen is large, but in spite of that, and of its brown rump and tail, I have identified it as *leucogenys* because of the greater extension of buff over the forelimbs and hind-feet which seems to be a character distinguishing that race from *phaeopepla*, and which will serve to separate them where differences in size and colour of back fail to do so; the colour of the yellow parts seems to be the same in both races. Possibly the specimen is intermediate, the typical locality of *phaeopepla* being S. Tenasserim, that of *leucogenys* S. E. Chantabun.

I have received from North Siam what appears to be, by comparison with topotypes, an undoubted example of *phaeopepla* collected at Muang Pre, (*antea*, p. 81) but from Pak Koh and Koon Tan to the eastwards, Gyldenstolpe* records *R. m. marana*, Thomas and Wroughton, of Popa, Central Burma: the difference between these two, both of which attain a skull length of 74 mm. or more, seems to be that the latter is black instead of brown. Possibly Gyldenstolpe's specimens, again, are intermediate as they are pure blackish brown.

Of the form inhabiting Peninsular Siam and the Malay States

* Kungl. Sv. Vet. Akad. Handl., 57, No. 2. p. 31 (1917)

Miller writes "From Trang to the southern limit of the group *R. m. peninsulæ* appears to be very constant in its characters" (*loc. cit.*) but this, judging from a large amount of material examined, is hardly accurate. Excluding the effects of obvious "bleaching" the colour of the upper parts varies from a clear black (not common) to a blackish brown, sometimes indistinguishable from the brown of *phaeopepla*: the underparts are also variable—at any rate in Malay States animals—for in a series of them the underparts of one-fourth are as richly coloured as in many of the Siamese and Malayan island forms, including a typical series from Terutau Island, which all (except *R. m. decolorata*† from Koh Samui and Koh Pennan, Coast of Bandon) differ from the mainland animals, with the above exceptions, in being more richly and deeply coloured below (I have not seen *caelanopepla* Miller, from Domel Island, Mergui Archipelago).

Except for size, therefore, *phaeopepla* does not seem to be a very clearly marked form; and young adults are no bigger than *peninsulæ*.

For measurements see p. 312.

26. *Ratufa aureiventer*

Ratufa affinis aureiventer, Bonhote, Ann. and Mag. Nat. Hist., (7), V, p. 495 (1900).

Ratufa aureiventer Kloss, antea p. 82.

1 ♂ ad. Bang Nara, Patani, Peninsular Siam. 2 July 1916. Messrs. Williamson and Smith's collectors. [No. 2489].

This example, though in very worn pelage, seems to satisfactorily confirm my determination of a previous specimen from the same locality.

For measurements see p. 123.

27. *Ratufa pyrrsonota*.

Miller, Proc. Biol. Soc. Washington, II, p. 75 (1900); Kloss, antea, p. 15.

1 ♀ aged, Bang Nara, Patani, Peninsular Siam. 2 July 1916. Messrs. Williamson and Smith's collectors [No. 2487].

1 ♂ young adult. Same locality. Mr. C. J. Aagaard [No. 2488].

Both examples are in rather worn and faded pelage and so consi-

† Robinson & Kloss, Ann and Mag. Nat. Hist. (8) xiii, p. 227 (1914).

derably paler than the specimen previously recorded from Nakorn Sritamarat.

For measurements see p. 312.

28. *Sciurus prevosti prevosti*.

Sciurus prevostii, Desm., Mamm., p. 335 (1822).

Sciurus prevosti prevosti, Kloss, antea, p. 82.

1 ♀ ad, 1 ♂ young adult. Bang Nara, Patani, Peninsular Siam. June and July, 1916. Messrs Williamson and Smith's collectors [Nos. 2490-1].

These further examples show that the specimen formerly attributed to Patani was so done correctly. They only differ from it in having less, or no white on the hands and feet and in the greater definition of the black stripes below the white of the sides. All three are very typical in appearance. This form occupies Johore, Malacca and Pahang east of a line joining Malacca and the bend of the Pahang River, and probably all the east coast of the Peninsula north to Patani or further.

The other form occurring in Peninsular Siam, *S. p. wrayi* Kloss, differs in having the shoulders washed with rufous; it inhabits the rest of the Peninsula from Trang southwards to Kuala Lipis, Pahang (typical locality), except the small area from Central Perak to Selangor inland to, at least, the summit of the main range which is occupied by a form with deep rufous shoulders, *S. p. humei* Bonhote.

For measurements see p. 313.

29. *Sciurus concolor concolor*.

Sciurus concolor, Blyth, Journ. Asiat. Soc. Bengal, xxiv, p. 474 (1855).

1 ♀ ad., 1 ♂ ad., Bang Nara, Patani, Peninsular Siam. 16 July and 3 August 1917. Messrs. Williamson and Smith's collectors [Nos. 2492-3].

This race differs from *S. c. milleri* (antea, p. 20) in being smaller and rather darker in colour, and is without the yellow areas on the sides of the neck, flanks and inguinal region: the tail is only slightly blackened at the tip which is not clearly margined as in *milleri*.

For measurements see p. 313.

30. *Sciurus bocourti bocourti*.

Sciurus bocourti, M.-Edw., Rev. Zool., p. 193 (1867).

Sciurus floweri, Bonhote, Ann. & Mag. Nat. Hist., (7) vii, p. 455 (1909).

Sciurus bocourti bocourti, Kloss, antea, p. 17.

Five examples of this very variable squirrel were given me by H. R. H. the Prince of Chumpon. They all came, I believe, from Bangkok, and I will describe them very shortly to show how greatly the form differs within itself: unfortunately the dates at which they were collected have not been recorded.

No. 2515. ♂ ad. Occiput, nape, back, and basal half of tail above, black, very finely and slightly speckled with white in places; the black extends narrowly down the middle of the upper part of the forelimbs and more broadly over the thighs: crown and distal half of tail above mixed black and white. Remaining parts white.

No. 2516. ♂ ad. Like 2515 but rather more speckled with white above.

No. 2517. ♀ imm. Disposal of colours as in 2516 but back, etc., brownish black finely speckled with rufous: distal three-fourths of tail banded black and rufous throughout with a few white hairs near the tip. Remaining parts white.

No. 2518 ♂ ad. Above ferruginous annulated with black; underparts rufous (burnt sienna); tail proximally ochraceous and black, distally mahogany red

No. 2519, ♀ ad. Like 2518 but practically without black on the head, fore-limbs and ankles and with the mahogany red of the tail extending along the lower surface to the root.

The last pair have smaller skulls and teeth than the first two specimens but all obviously belong to the same form and are connected by the intermediate example from Sam Kok (antea, p. 17) which has the speckled back of the latter animals and the white muzzle, ears and underparts of the others.

For measurements see p. 313.

31. *Sciurus vittatus miniatus*.

Sciurus notatus miniatus, Miller, Proc. Acad. Nat. Sci. Washington, ii, p. 79 (1900).

Sciurus vittatus miniatus, Kloss, antea p. 20.

1 ♂ subad. Bang Nara, Patani, Peninsular Siam. 30 June 1916.
Messrs. Williamson and Smith's collectors [No. 2494].

32. *Tamiops barbei kongensis*.

Sciurus maclellandi kongensis, Bonhote, P. Z. S., 1901, p. 54.

Tamiops barbei kongensis, Kloss, antea, p. 84.

Skin, without skull, from Lakon Lampang, North Siam. 28 August 1915. Collected by Mr. K. G. Gairdner. [No. 2600].

Bonhote when describing this subspecies pointed out that it possessed both a summer and a winter pelage and on p. 22 of this Journal I described a specimen with short ear-tufts, taken at Muang Prae on April 28th, which was evidently assuming the bright summer phase.

The present specimen is much duller in colour with longer ear-tufts and may be taken as attaining the winter phase. Colour of head, shoulders, limbs and sides greyish, the hairs with pale buffy tips. The two outer pale stripes which run from muzzle to tail are very broad, buffy on the rump, cream on the shoulder and very pale on the head; the inner pair start from the shoulders and are narrow and buff. There are three dark stripes running from the shoulders to tail, all clear black; and the outer yellow stripes are bordered below by a short, broad, indefinite, grizzled, black line. The ears, hands and feet are buffy; the hair on the back of the ears black, that near the tips long with white ends. Throat and under-side of fore-arms greyish, under side of body and hind-limbs buff-yellow to orange-buff. Tail annulated with buff and black, the hairs with buffy-white tips; the extremity black.

The differences in colour between the two phases are largely confined to the upper parts.

Head and body, 101; tail, 117; hindfoot, s.u., 26.

In the dull phase *kongensis* seems hardly distinguishable from specimens from S. Tenasserim which are probably very near true *barbei*. I have seen no topotypes of the latter from Ye but have examined specimens from Tenasserim Town, which are perhaps intermediate between typical *barbei* and *novemlineatus* of Trang,

Peninsular Siam, and the only difference between these squirrels and *kongensis* in dull phase appears to be that the former have the outer yellow stripes rather broader, longer tufts to the ears and tail a little more hoary.

33. *Rhinosciurus laticaudatus tupaoides*.

Rhinosciurus tupaoides, Blyth, Journ. Asiat. Soc. Bengal, xxiv, p. 477 (1855); Robinson and Kloss, Journ. F. M. S. Mus., V, p. 122 (1914).

Rhinosciurus peracer, Thomas and Wroughton, Ann and Mag. Nat. Hist. (8), iii, p. 440 (1909); id., Journ. F. M. S. Mus., iv, p. 119 1909.

2 ♀ ad. Bang Nara, Patani, Peninsular Siam. 1 and 2 August 1917. Messrs. Williamson and Smith's collectors [Nos. 2495-6].

Colour above mixed black and ochraceous, blackest along the middle line of the back, yellowest on the sides: underparts white to buffy-white.

One specimen has the tail hairs tipped with whitish, the other with buffy-ochraceous as in the spurious race *peracer*.

The squirrels of this genus are ground animals of dull colouration with remarkably long muzzles: they feed largely on ants and termites and their teeth rapidly wear away owing to the amount of grit they take in with their food: the incisors are always remarkably weak and small, showing that they are not used for gnawing as with most other squirrels.

34. *Chiropodomys gliroides*.

Mus gliroides, Blyth, Journ. Asiat. Soc. Bengal, xxiv, p. 721 (1855).

Mus peguensis, Blyth, op. cit., xxviii, p. 295 (1859).

Chiropodomys (gliroides) peguensis, Gairdner, Journ. N. H. Soc. Siam, i, p. 253 (1915).

1 ♂ ad. Lat Bua Kao, E. Siam. 22 Sept 1916. Messrs. Williamson and Smith's collectors [No. 2502].

This little soft-furred mouse is Sayal brown above (Ridgway) and white below and has the tail fairly thickly clad with hair posteriorly.

Measurements:—Head and body, 89; tail, 117; hind-foot, s. u., 19; ear, 17. Skull: greatest length, 25.0; condylo-basilar

Measurements of Siamese Squirrels in Millimetres.

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Species and Locality.	Sex	Head and Body	Tail	Hind foot s. u.	Ear	SKULL								No.	Remarks
						Greatest length	Condylor-basilar length	Palatilar length	Diastema	Upper molar row (alveoli)	Median nasal length	Inter-orbital breadth	Zygomatomatic breadth		
<i>Ratufa melanopepla peninsulæ</i>															
Bang Nara, Patani, Peninsular Siam ...	♂	401	404	72	29	68.8	57.2	25.2	14.4	14.0	21.6	26.0	32.0	2486	Adult.
<i>Ratufa melanopepla leucogenys</i>															
Nong Kha, Sriracha, S. E. Siam ...	♀	48*	...	75.0†	64.0	29.0	16.2	14.0	23.0	29.8	45.0†	2499	Adult.
<i>Ratufa aureiventer</i>															
Bang Nara, Patani, Peninsular Siam ...	♂	347	457	70	27	67.0	56.0	26.0	15.0	13.0	21.0	27.8	41.1	2489	Adult.
<i>Ratufa pyrrsonota</i>															
Bang Nara, Patani, Peninsular Siam ...		356	405	66	31	66.0	54.5	26.0	14.7	13.0	22.9	26.7	40.2	2487	Aged.
do do	75*	...	66.0†	...	25.0	13.9	12.5	21.4	25.8	40.0	2488	Adult.

Measurements of Siamese Squirrels in Millimetres.

Species and Locality	Sex	Head and Body	Tail	Hind-foot s. u.	Ear	SKULL								No	Remarks
						Greatest length	Condylor-basilar length	Palatilar length	Diastema	Upper molar row (alveoli)	Median nasal length	Inter-orbital breadth	Zygomat. breadth		
<i>Sciurus prevosti prevosti</i>															
Bang Nara, Patani,															
Penr. Siam, ... ♀	♀	265	254	53	21	58.8	50.9	25.0	13.6	11.1	20.3	24.4	35.0	2490	Adult.
do. do. do. ... ♂	♂	262	223	55	21	58.0	50.0	24.2	13.0	10.6	20.0	23.0	34.4	2491	Young adult.
<i>Sciurus conolor conolor</i>															
Bang Nara, Patani,															
Penr. Siam ... ♀	♀	203	171	43	21	51.0	43.5	22.0	12.0	10.0	15.5	16.8	28.8	2492	Adult.
do. do. do. ... ♂	♂	213	198	46	...	52.0	44.0	21.3	11.9	9.9	15.0	16.0	28.9	2493	Adult.
<i>Sciurus bocourti bocourti</i>															
Bangkok ?	♂	45.5*	...	...	...	21.5	11.2	9.9	14.5	18.0	30.0	2515	Adult.
do.	♂	45.5*	...	...	...	21.0	11.0	10.2	14.4	18.0	30.0	2516	Adult.
do.	♂	19.0	10.5	8.9	12.3	17.0	27.5	2518	Adult.
do.	♀	10.7	9.0	11.5	19.0	...	2519	Adult.
<i>Rhinosciurus laticaudatus tupaoides</i>															
Bang Nara, Patani,															
Penr. Siam ... ♀	♀	230	135	45	19	56.5	49.8	28.2	16.1	11.7	20.0	13.1	28.8	2495	Adult.
do. do. do. ... ♂	♂	225	121	43	20	56.8	50.1	28.2	16.1	12.9	19.4	13.8	27.8	2496	Adult.

* from dried skin. † approximate.

length, 4.8; palatilar length, 11.2; diastema, 6.8; upper molar-row (alveoli), 4.0; median nasal length, 7.0; interorbital breadth, 4.8; zygomatic breadth, 14.8.

Mr. G. C. Shortridge notes of a large series obtained by him in Tenasserim and recorded by Wroughton as *C. peguensis* (Journ. Bombay. N. H. Soc., xxiii, p. 715, 1915):—"Very plentiful around Bankachon wherever there were bamboos. They never got into traps, even when set among bamboos, but were easy to find as they hid by day, generally singly, occasionally a female and two young, inside the hollow joints of dead bamboos, through one side of which they had bored a circular entrance, about two inches in diameter.

Weight.— $\frac{1}{2}$ -1 oz."

15. *Rattus surifer surifer*.

Mus surifer Miller, Proc. Biol. Soc. Washington, xiii, p. 148, pl. iv, figs 4, 4a, 4b. (1900).

Epimys surifer surifer Kloss, antea, p. 26.

1 ♂ ad. Bang Nara, Patani, Peninsular Siam. 1 Aug 1916 [No. 2498].

1 ♀ ad. Pak Nam Chumpon, S.W. Siam. 7 July 1914. [No. 2551]. Both obtained by Messrs. Williamson and Smith's collectors.

Measurements of No. 2551:—Head and body, 195; tail, 190; hind foot, s. u., 41; ear, 27. Skull:—greatest length, 45.5, condylo-basilar length, 37.5; palatilar length, 18.0; diastema, 12.2; upper molar-row (alveoli) 6.9; median nasal length, 18.0; interorbital breadth, 6.3; zygomatic breadth, 20.0.

36. *Nyctocleptes cinereus*.

Rhizomys cinereus McClelland, Calcutta Journ. Nat. Hist., ii, 1842, p. 356 (Tenasserim); Wroughton, Journ. Bombay N. H. Soc., xxiii, p. 716 (1915).

Rhizomys erythrogenys Anderson, Proc. Asiat. Soc. Bengal, 1877, p. 150; id. Anat. and Zool. Res., p. 324, plate xiii, A. (Salwin Hill Tracts and Tenasserim).

1 ♂ juv., 1 ♀ juv. Mee Taw Forest, Raheng, Central Siam, 2500 ft. 18 December 1913. Mr. C. S. Barton [Nos. 2616-7].

Two very young bamboo-rats with the anterior cheek-tooth only just showing were dug with the mother and three others out of a burrow among the roots of bamboos.

These young examples are very different in colour from adults but they have been in spirit for four years and have perhaps faded a good deal: they are brown above and pale below, the head is pale ferruginous and the darker colour of the nape extends forwards to between the eyes in the form of a V.

Head and body, 136,138; tail, 42,41; hind foot, 24,25; ear, 9,10.

37. *Acanthion brachyurus brachyurus*.

Hystrix brachyurus, Linn. Syst. Nat., i, Ed. 10, p. 57 (1758).

Acanthion brachurus, Kloss, antea, p. 85.

Two foetuses in spirit. Bang Nara, Patani, Peninsular Siam. Mr. C. J. Aagaard (Nos 2609-10).

Entirely naked except for six rows of short bristles on the sides of the snout, a bristle above the eye, another behind and below it, one behind the angle of the mouth, and a couple on the throat.

Length of head and body about 125; tail, 34; hind foot, s.u. 17; ear 7.5.

I understand that these foetuses came from the porcupine recorded on p. 86.

38. *Tragulus kanchil fulviventer* > *ravus*.

2 ♂, 1 ♀. Bang Nara, Patani, Peninsular Siam, July 1916. Messrs. Williamson and Smith's collectors. [Nos 2481-3].

These three examples of the Lesser Mouse-deer are intermediate between *fulviventer* Gray, of Singapore and the Malay States, and *ravus* Miller, of Trang, Peninsular Siam: though rather duller than the former they have the nape stripe equally pronounced, whereas in *ravus* it is not so marked.

In mouse-deer the upper canines in bucks take the form of long moveable tushes (about 18 mm) which are represented by very small teeth in the does.

Head and body, 436, 454, 459; tail, 75, 77, 72; hind foot including hoof, 116, 116, 117; ear, 39, 37, 35.

Skulls: greatest length, 94, 92.5,—; condylo-basal length, 86, 85,—; greatest breadth, 41.3, 42.3, 41; maxillary tooth-row excluding incisors (alveoli), 34, 31.5, 33.8.

39. *Bos banteng birmanicus*.

Bos sondaicus birmanicus, Lydekker, P. Z. S., 1898, p. 227, pl. xxv.

Bos banteng birmanicus, Lydekker, Cat. Ungulate Mammals B. M., i, p. 27, fig. 13, (1913).

Bos sondaicus porteri Lydekker, P. Z. S., 1909, p. 669.

Bos banteng porteri, Lydekker Cat. Ung. Mamm. B. M., i, p. 28 (1913).

Bos sondaicus and *Bos sondaicus porteri*, Gairdner, Journ. N. H. Soc. Siam, ii, p 250 and plate (1917.)

Skull and head-skin of an immature bull from Maa Wong Forest about 80 miles N. W. of Paknambo, Central Siam. Messrs. G. F. W. Elwes and H. C. St. J. Yates [No 2578].

The colour of the skin is pale brownish, irregularly spotted with white throughout, darker above the muzzle and ochraceous on the forehead, neck and outer sides of the ears above; the remainder of the ears, within and without, and the lips are white. Horns black distally, brownish-yellow basally.

Greatest length of skull, 460; external biorbital breadth, 202; upper tooth-row (alveoli) 147 mm.

Greatest breadth across horns, 633; tip to tip, 380; length along outer curve, 495; girth at base 305 mm.

I agree with Gairdner in considering that no sufficient reasons have been advanced for the recognition of the Siamese banteng or tsine as a distinct subspecies (*B. b. porteri*) and have long suspected that, as he now shows, the white spotting which was supposed to distinguish it was merely an instance of aberration.

The same thing occurs among the semi-domesticated banteng of Bali where I have noticed herds which included one or more beasts quite as spotted as the Siamese wild animal figured by Gairdner (type of *porteri*). If, of course, the majority of individuals in a region were thus coloured there might be sufficient reason for admitting a local form, but at present this is not the case, spotted animals being only isolated "sports."

It is possible that such sports indicate the beginning of a progress of evolution and that animals so coloured may eventually become dominant; but we shall have to wait a long time before the use of the name *porteri* becomes thus justified — unless Siamese animals happen to possess peculiar characters which have not yet been perceived.

I therefore use the name of the Burmese animals which, though old bulls *do* attain a blackish coat*, seems to differ from the typical race in a lesser development of the white rump patches.

Notwithstanding Butler's† and Lydekker's‡ identification of the female skull of some kind of ox from Perak as a banteng, there is no real proof of the existence of the species in the Malay States: a great number of horns and frontlets obtained by Europeans and Malays have been seen, but all are unquestionably those of gaur or sêladang: undoubtedly if the banteng occurred, trophies of it would have been noticed among them. The distribution is therefore parallel with that of several other animals and some birds, i. e., the species occurs in Indo-China and one or other of the Malay Islands but skips the Peninsula.

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The following corrections are required in my previous papers on mammals in this volume:—

- p. 5, line 5: *for* *osbcura* *read* *obscura*
- p. 5, „ 6: „ *female* *read* *male*
- p. 30, last line: „ *type* *read* *types*
- p. 31, measurements of *Tamias rodolphi* should read:—median nasal length, 8.0 *and* interorbital breadth, 10.7.
- p. 34, line 21: *for* *measurement* *read* *measurements*
- p. 80, „ 25: *between* *the* *and* *fruit-bats* *insert* *continental*.
- p. 83, „ 23: *for* 17 *read* 18
- p. 216, „ 33 „ *description* *read* *description*
- p. 236, on plate opposite: *for* ♂ *read* ♀, *and* *for* *mammal* *read* *mammæ*.
- p. 242, on plate opposite *for* fig. 7 *read* fig. 6.
- p. 242, „ „ „ „ fig. 6 *read* fig. 7.
- p. 243, line 1: *delete* of the

* *Vide* Evans, who also says that young bulls often have white spots on their flanks which in course of time merge into each other and turn a dirty grey (Big Game Shooting in Upper Burma, pp. 81-3; 1911)

† *Bos sondaicus*, Malayan form, Butler, Journ. Bombay N. H. Soc., xiii, p. 192, plate (1909).

‡ *Bos sondaicus butleri* Lydekker, Field, cv, p. 151 (1905); id., Game Animals of India, p. 75 (1907); id., Cat. Ung. Mamm. B. M., i, p. 29 (1913).

- p. 247, line 10 *for* throughout *read* throughout
p. 247, „ 10 „ crab eating *read* crab-eating
p. 247, „ 22 „ natural *read* neutral
p. 249, „ 8 „ *resimal* *read* *resima*¹ and refer
to it the footnote on p. 248.