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Smith

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THE
JOURNAL
OF THE
Natural History Society of Siam.

Vol. I.

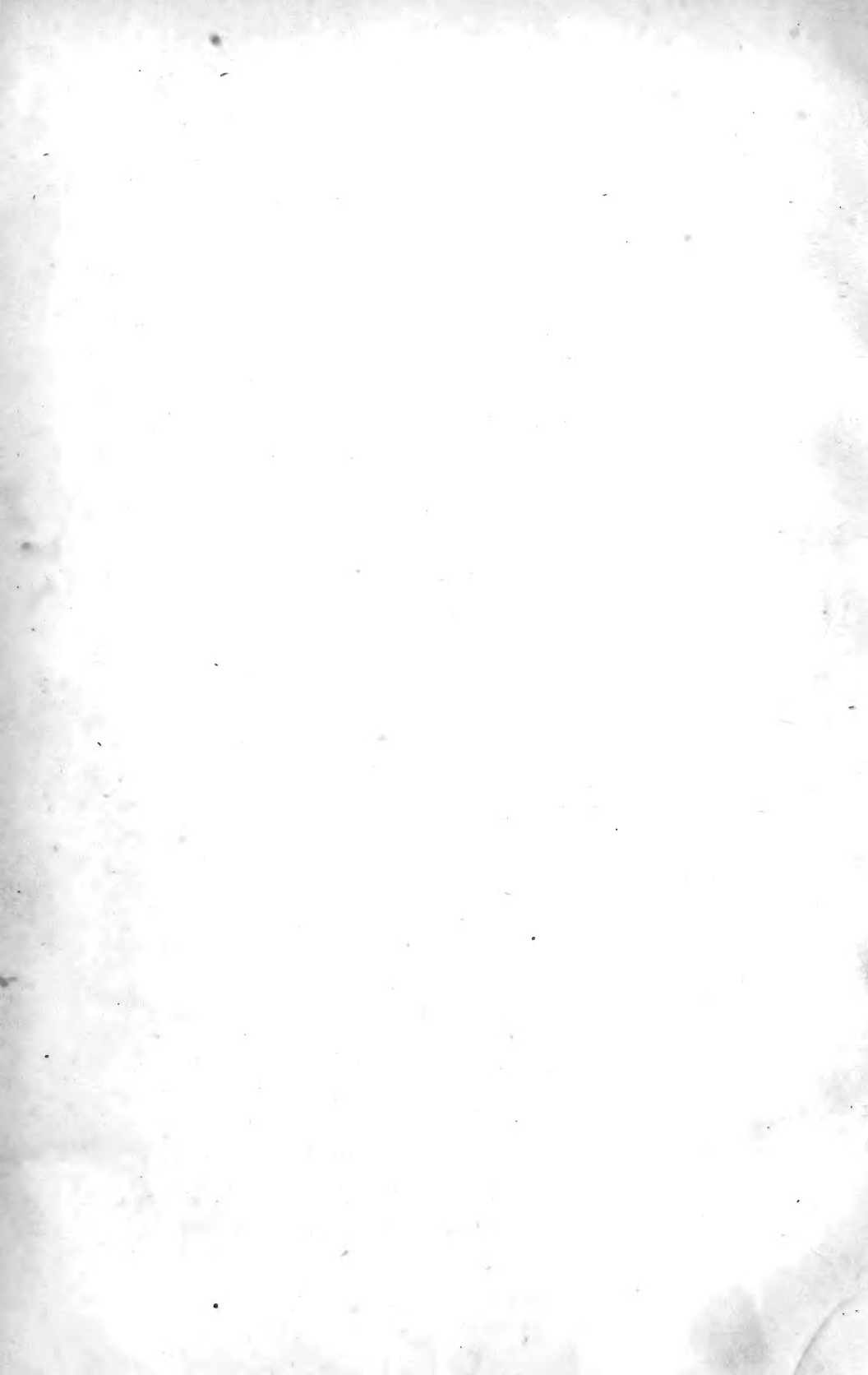
Comprising Five Parts and containing Sixteen
Plates and Two Maps.



Nos. 1, 2, 3, and 5 Edited by
Malcolm Smith and W. J. F. Williamson.

No. 4 Edited by
Malcolm Smith and E. G. Herbert.

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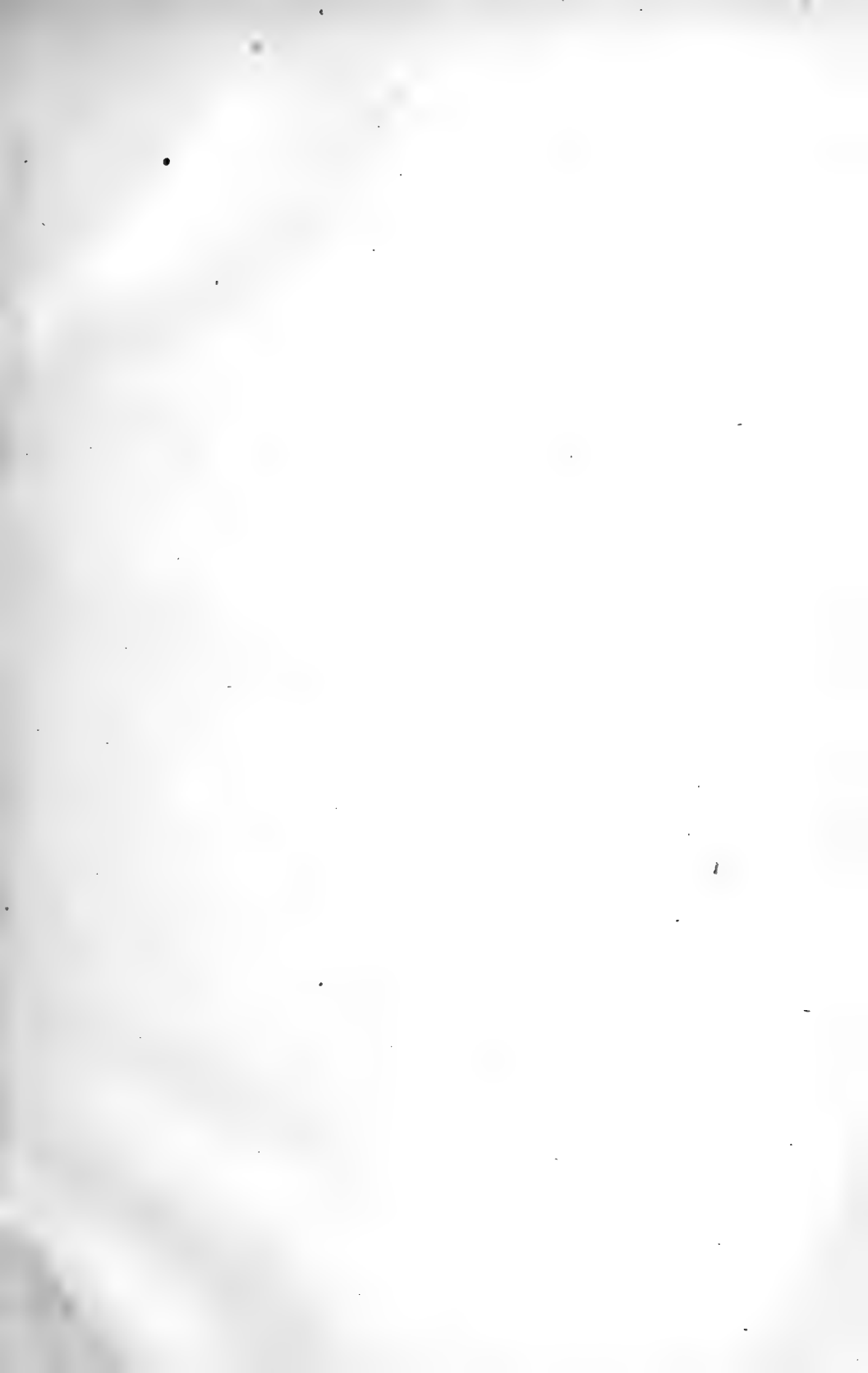
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ADDENDA AND CORRIGENDA.

P. 10, line 4 from bottom.	For " <i>Cylindrophus</i> " read " <i>Cylindrophis</i> ."
P. 16, ,, 2 ,, bottom.	For "glow" read "grow."
P. 30, ,, 4 ,, top.	For " <i>tradigradus</i> " read " <i>tardigradus</i> ."
P. 36, ,, 11 ,, top.	For "griggled" read "grizzled."
P. 43, ,, 9 ,, top.	For " <i>Pericrotus</i> " read " <i>Pericrocotus</i> ."
P. 43, ,, 10 ,, top.	For " <i>Pericrotus</i> " read " <i>Pericrocotus</i> ."
P. 48, ,, 9 ,, top.	For " <i>Sacrogrammus</i> " read " <i>Sarcogrammus</i> ."
P. 50, ,, 17 ,, top.	For "maller" read "smaller."
P. 57, ,, 9 ,, top.	For " <i>Rhodostroma</i> " read " <i>Rhodostoma</i> ."
P. 96, ,, 4 ,, bottom.	For " <i>limnocaris</i> " read " <i>limnocharis</i> ."
P. 126, ,, 8 ,, top.	For " <i>Tentaculatum</i> " read " <i>Tentaculatum</i> ."
P. 130, ,, 17 ,, top.	For " <i>marmoratus</i> " read " <i>peguensis</i> ."
P. 146, ,, 9 ,, bottom.	For " <i>cynomologus</i> " read " <i>cynomolagus</i> ."
P. 147, ,, 9 ,, top.	For " <i>Prionadon</i> " read " <i>Prionodon</i> ."
P. 149, ,, 6 ,, bottom.	For "Rutous" read "Rufous."
P. 153, ,, 12 ,, bottom.	For " <i>Marmoratus</i> , Fitz" read " <i>Peguensis</i> , Blgr."
P. 154, ,, 1 ,, top.	After "specimen" insert "(<i>D. formosus</i>)."
P. 170, ,, 20 ,, top.	For " <i>Copeychus</i> " read " <i>Copsychus</i> ."
P. 181, ,, 5 ,, bottom.	For " <i>moellendorffi</i> " read " <i>moellendorffii</i> ."
P. 197, ,, 2 ,, bottom.	For " <i>memoricola</i> " read " <i>memoricola</i> ."
P. 203, ,, 12 ,, bottom.	For " <i>memoricola</i> " read " <i>memoricola</i> ."
P. 204, ,, 12 ,, top.	For " <i>memoricola</i> " read " <i>memoricola</i> ."
P. 208, ,, 15 ,, bottom.	For "Irish" read "Iris."
P. 215, ,, 5 ,, top.	For " <i>Mollendorffi</i> " read " <i>Moellendorffii</i> ."
P. 217, ,, 17 ,, top.	For " <i>ignipictus</i> " read " <i>ignipectus</i> ."
P. 221, ,, 5 ,, top.	For " <i>Epimus</i> " read " <i>Epimys</i> ."
P. 221, ,, 13 ,, top.	For " <i>Epimus</i> " read " <i>Epimys</i> ."
P. 224, ,, 1 ,, top.	For " <i>Epimys</i> " read " <i>Epimys</i> ."
P. 239, ,, 9 ,, top.	For " <i>Verticellatus</i> " read " <i>Verticillatus</i> ."

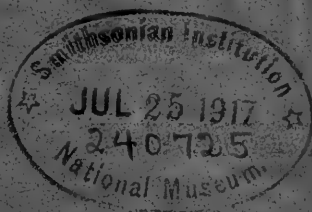




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EDITED BY

Malcolm Smith and W. J. F. Williamson.

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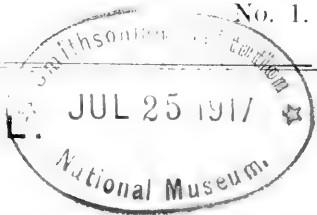
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EDITORIAL.



It is with great pleasure that we issue this, the first number of the Journal of the Natural History Society of Siam. That some such publication would be forthcoming was obvious from the commencement of the Society, both as a record of what was being accomplished, and as a means of binding our scattered members more closely together.

It is hoped that we shall be able to issue the Journal at least three times a year, but this will depend upon the material in hand and on the funds available. We do not propose to bind ourselves down to any fixed dates of production, as we should probably be unable to adhere to them. The difficulties to be overcome in editing such a publication as this are considerable, particularly in the matter of illustrations, most of which have to be reproduced in Europe.

The Society has now been in existence for one year, and at the time of going to press its membership numbers 64. This is many more than was anticipated in the beginning, and we may congratulate ourselves upon the rapid strides we have made, and upon the large amount of interest which we have managed to arouse in so small a community. We hope that each member will do his or her best to assist the Journal with contributions. Those who do not feel qualified with a sufficient knowledge of their subject to send in papers, can at least forward notes upon the habits of animals and plants, or local lists of collections made in different parts of the country. The

latter will be of use in working out the geographical distribution of species.

An immense amount of work in every branch of Natural History is waiting to be done in Siam—work which possesses all the pleasure and fascination attaching to any form of pioneer research. Hitherto it has been an almost untouched field. Few expert naturalists have visited the country, still fewer have lived in it, and the records of both its fauna and flora are meagre. It is not to be expected that any large number of species will be added to Science, at least among the vertebrates, but it is in the distribution of those species already known, and in the life-histories of the little-known ones, that so much remains to be accomplished.

Siam, as would naturally be expected, has species in common with those of each country which she adjoins, and although the great majority of them are found over the whole area, the limit of distribution of many lies through her own territory. Of the fauna of Burma and of the Malay Peninsula we have a fairly extensive knowledge, and the literature upon the subject relating to those countries is considerable, and is indispensable to anyone working in Siam. The same, unfortunately, cannot be said of Indo-China, in regard to which no publication of any great value has yet appeared, to which reference can be made for information concerning the many species peculiar to that country and Siam.

The two regions of which we probably know the least are, the large tract of country to the east and north of Korat, bordering upon Indo-China, and the mountainous district west of Petchaburi, adjoining the Burmese frontier. Both offer a rich field of new material and will well repay any naturalist who can find the time and money to visit them.

It is to be hoped that within a year or two the Society will be in a position to publish certain hand-lists relating to the fauna and flora of this country. These will be published separately from the *Journal*. They will naturally be far from complete, but they will form a basis for future work and should be valuable as a reference to anyone studying the particular subjects dealt with. A circular letter relating to this matter has already been issued, and it is hoped that every member will assist the Society in its undertaking. The Committee will be only too pleased to help members in every way

with the identification of specimens, and, where this cannot be done in Bangkok, to see that they are forwarded to others who have a greater knowledge of the subject.

It is believed that enough material is already in hand to issue the lists relating to the Mammals, Birds and Reptiles, and these will no doubt be the first to appear. The lists published by Capt. S. Flower in 1900 in the *Proceedings of the Zoological Society* upon the Mammals and Reptiles are both very valuable, but a considerable amount of information has been gained since then, and the identity of certain species at that time obscure, has been now cleared up.

With regard to the Birds, if we except such standard works as Oates' *Birds of British Burma*, 1883, and Oates' and Blanford's volumes on Birds, in the *Fauna of British India*, 1889-1898, no publication in any way pretending to be complete has yet been issued. Both the works just mentioned naturally include a great number of the species inhabiting Siam, but in the majority of cases no record has been made of their having been found here. Of local lists, the most comprehensive is that published by Messrs. Robinson and Kloss in 1911, on *Birds from the Northern portion of the Malay Peninsula* (mainly obtained in the Muang of Trang), while Count Gyldenstolpe, again, as recently as 1912-13 made a short expedition to this country, and published last year a list of the birds he obtained.

As regards the Fishes and Insects of this country, practically nothing has been published, so far as we are aware, though several collections of Butterflies have been made—notably one by Mr. E. J. Godfrey. It is hoped that a list of the species comprised in this collection will be issued before long.

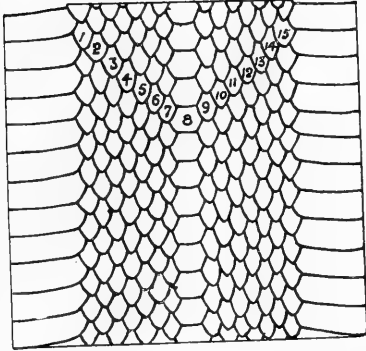
In connection with the Flora, a very extensive subject, the most prominent worker is Dr. A. F. G. Kerr, who has published some papers in the *Journal of the Siam Society*, as well as in one or two British scientific journals. Much valuable work is also being done by the officers of the Forest Department, who have for some time past been making systematic collections of the plants of Siam, and forwarding them to Kew (the Botanical headquarters of Great Britain), where they are being investigated, and the results published from time to time.

We include elsewhere in this number a Catalogue of the works

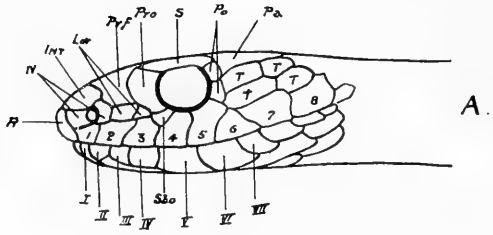
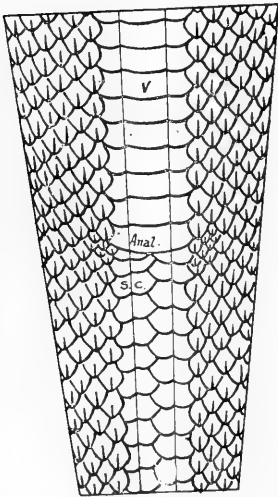
upon Natural History relating to Siam. It is, we believe, with the possible exception of short articles that may have appeared in scientific journals, a complete list of all the literature which has so far appeared in the English language.

We would conclude by repeating once more our sincere request that every member will endeavour to contribute something towards the welfare of the Society and its Journal. We are still in our infancy and upon our trial. It will depend very largely upon the results of the next year or two whether the Society is to retain its place or not as one of the useful and permanent institutions of this country.

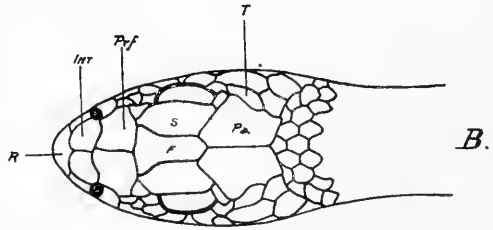
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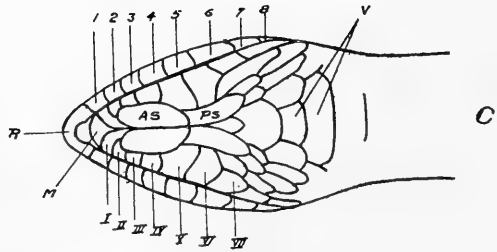
E.



A.



B.



C.



EXPLANATION OF PLATE.



Head of *Zamenis mucosus*.

A. Side view. B. Upper surface. C. Under surface.

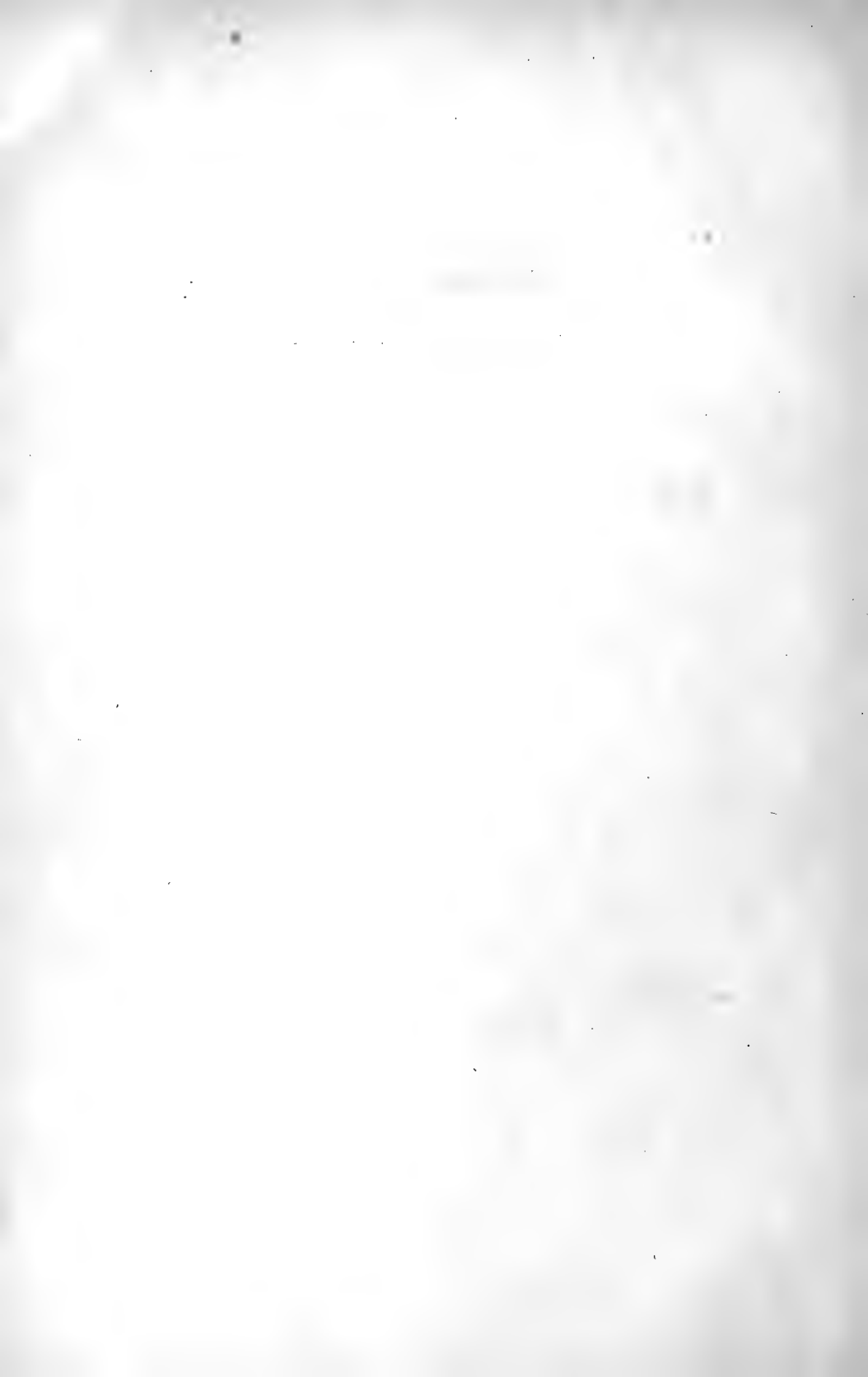
R. Rostral.		N. Nasal.		Int. Internasal.
Lor. Loreal.		Prf. Praefrontal.		Pro. Præocular.
S. Supraocular.		Po. Postocular.		Pa. Parietal.
Sbo. Subôcular.		T. Temporal.		F. Frontal.

A. S. Anterior sublinguals. | P. S. Posterior sublinguals.

Arabic numerals—Supralabials. | Roman numerals—Infralabials.

D. Body of *Bungarus fasciatus* (Banded Krait) showing enlarged vertebral scales, and method of counting the costal scales. Ventral shields shown on either side.

E. Under surface of *Chrysopelea ornata* showing Ventral (V) and Subcaudal (S. C.) shields with the lateral keel and a notch on each side corresponding to the keel. Costal scales shown on either side.



THE SNAKES OF BANGKOK.

BY MALCOLM SMITH.

The following articles are the outcome of a paper which was read before the Society in June last. At that time only the common species were dealt with, but the matter has since been enlarged to include all the species at present known to have been found in Bangkok and its immediate neighbourhood.

A full technical description of each snake will not be attempted here, but sufficient will be given, it is hoped, to enable anyone to identify all the species likely to be met with. The descriptions as regards coloration apply only to those found in Bangkok, and do not necessarily hold good for the same species in other parts of Siam, although all those that I have so far been able to examine from various districts show, practically, no variation. It should be remembered however, that some snakes differ considerably in markings, especially, when they come from other countries, and to distinguish them by this means alone, cannot always be relied upon. The character and disposition of the scales upon the head and body must be taken into consideration, for they remain almost constant, and form the only trustworthy guide to identification.

The accompanying plate shows the conformation and relationship of the various scales which are used for this purpose, and at the conclusion of these articles will be found a very simple key, by which anyone can readily distinguish all the species which have been described.

In 1900 Captain Stanley Flower after spending some two years in this country, published an article* in the *Proceedings of the Zoological*

* "Notes on a Second Collection of Reptiles made in the Malay Peninsula and Siam." Only those portions dealing with Siam have been referred to in the present articles.

Society upon the reptiles of Siam. It included notes upon those he had met with himself together with a list of all the species that had been found in the country up to that date. It is needless to say that with such a valuable work to refer to, the task of drawing up the present list has been much simplified.

The number of snakes recorded by him from Siam was not great. It comprised only 56 different species, of which 26 had been met with in Bangkok. To this latter number 12 more may now be added, making a total of 38, a fair number for a tropical locality. It is interesting to compare his list made fourteen years ago with the present one, and to note how certain kinds, at that time apparently rare, have since become common. These particular ones will be referred to in due course.

Bangkok is fortunate in being peculiarly free from poisonous snakes. By the Siamese who might be expected to know something about the matter, the majority are considered poisonous. This is not so. Only four species are to be met with, and of these but two, *Naja tripudians*, the Cobra, and *Bungarus fasciatus*, the Banded Krait, need be reckoned with. The third, *Vipera russelli*, Russell's Viper, has so far only once been recorded,* while the fourth, *Lachesis gramineus*, the Green Tree Viper, although plentiful everywhere, does not possess a poison which is fatal to human beings.

Authentic records of bites from poisonous snakes in Bangkok are, in fact, if we except the last named, extremely rare, and fatal records almost unknown. In eleven years of medical practice I have not seen a single case resulting in death, neither after enquiry among my fellow practitioners have I been able to gather more than one. This immunity is possibly due to two causes, partly to the reason that the two species already mentioned are far from common, but also because both of them are well known for their marked disinclination to bite, even under provocation. In this latter respect the Banded Krait is remarkable.

The inhabitants of the country districts are not quite so fortunate as those in Bangkok, but Siam as a whole compares extremely favorably

* It is more common in the North.

in the matter of poisonous snakes with both India and Burma. If we except the sea snakes, only three other species, namely, *Naja bungarus*, the Hamadryad or King Cobra, *Ancistrodon rhodostoma* and *Ancistrodon blomhoffi*, have yet been recorded from this country, although others will no doubt be ultimately discovered.*

To attempt to attach Siamese names to the various species of snakes is a difficult task. In going through the list that I have I can find only about a dozen which may be confidently relied upon to be always given to the same snake, by those who know anything about the subject. The rest of the names are so loosely and indiscriminately applied that it is impossible to affix them to any particular species. The term งูเขียว (ngu khieo) is applied to any snake of a green color, งูดิน (ngu din) to the earth snakes, whilst งูปลา (ngu pla) includes the whole tribe of fresh water snakes. Sometimes the same name will be used for different species in different localities, or the young, if differing in color from their parents as they often do, will be looked upon as a different kind and accorded a different title. After all it is not to be wondered at. The Siamese have not yet taken up the study of Natural History, and the country people from whom the names originate, have as a rule not much interest in any creature that does not enter into their dietary.

For those who wish to take up the study of snakes more thoroughly, there are several text-books in existence, the two most valuable for this country being Boulenger's recently published volume upon the Reptiles and Batrachia of the Malay Peninsula and his older work upon the Reptiles and Batrachia of British India. These two volumes include all the known species which Siam shares with those countries.

The classification adopted in the present articles is according to the first of the two works just mentioned.

* The following poisonous species will most probably, judging from their present known distribution, be found in Siam. *Bungarus candidus*, *flaviceps*, and *multicinctus*, *Lachesis monticola* and *purpureomaculatus*, *Doliophis bivirgatus* and *intestinalis*, *Calliophis maculiceps* and *maccllellandi*. The four last, on account of the small size of the mouth, can be hardly considered dangerous to mankind.

Suborder OPHIDIA.

Family TYPHLOPIDAE.

These small worm-like snakes lead an almost entirely subterranean existence, and are therefore not often met with by the casual observer. They feed largely on worms. In general aspect many of the species bear a close resemblance to each other and cannot be identified without a close and detailed examination. There are no ventral shields as with the majority of snakes and the body is covered with smooth scales of uniform size. The tail is blunt, extremely short and it is often difficult at a glance to distinguish it from the head. The eyes are very small and covered by shields. Three species have so far been found here.

1. *Typhlops braminus*.

Siamese. งดิน (ngu diu), the term being applied indiscriminately to many of the earth snakes.

Not very common in Bangkok, although it is by far the commonest and most widely distributed of all the burrowing snakes in Southern Asia. Possibly the inundations to which we are annually subject and which often last a considerable time, prevent this species from becoming more prevalent. Found in the earth of gardens, or in hiding beneath logs of wood or among heaps of old leaves. By the Siamese it is considered highly poisonous, but apart from its lacking poison glands, the mouth is so extremely small that it can hardly be capable of biting even in self defence. I have never yet known one attempt to do so. Length 175 mm. (7 inches).

Colour and markings. Black or dark brown above, lighter beneath, snout, anal region and end of tail usually whitish.

Habitat. Southern Asia and the islands of the Indian Archipelago. Also South Africa and Mexico.

2. *Typhlops schneideri*.

Habitat. Siam.

3. *Typhlops albiceps*. Both these species are extremely rare. They are recorded in Flower's list, but have not been met with since in Siam, although the latter has been found in the Larut Hills, Perak.

Habitat. Siam and Malay Peninsula.

Family BOIDAE.

4. *Python reticulatus*. The Reticulated Python.

Siamese. งูหลาม or งูเห่า (ngu lam or ngu leuam), the former name commonly used in Bangkok, the latter outside, but considerable difference of opinion prevails, and the Siamese will always affirm that they are different species. I have seen many specimens but have so far been unable to confirm this.

It is not uncommon in Bangkok, frequenting chiefly the gardens in the neighbourhood of habitations, the outhouses of which it often enters in search of food. The ease with which it can procure a meal near human dwellings no doubt attracts it there, but it is certainly remarkable that a snake which attains such large dimensions, which has such conspicuous markings and which on account of its sluggish disposition is so easily killed, should be able to survive in the very midst of a thickly populated town. Their nocturnal habits and the fact that they are very prolific no doubt account for this.

During the day they usually seek some elevated position, often lying in the most exposed situation and making little effort to conceal themselves. They are good climbers and can ascend the trunks of trees with great ease, even when there is no assistance to be obtained from branches. This they do by throwing the middle of the body into two or more loops which partly encircle the stem, and by holding on in this way they are then free to push up the fore part of the body, and take a similar purchase at a higher level. They are seldom found far from water and take to it readily to avoid capture.

Food. Small mammals and birds which they kill by constriction. Young pythons appear to consume chiefly rats, probably because they are more plentiful than other forms of food. Whether or no larger ones eat cats for the same reason I cannot say, but the number of times I have known them taken is quite out of proportion to other creatures such as fowls, ducks or dogs. In captivity my own feed largely upon rats and the way in which a coil of the body is thrown over the head of the animal so as to press the muzzle tightly into the chest, is very clever. This serves a double purpose. It aids suffocation and at the same time prevents the rat from biting its captor, but whether both are intentional I am unable

to say. No bones are broken as it is commonly believed, and the animal dies of asphyxia.

Pythons grow to a great size, like the rest of the Boa family. Specimens are said to have been killed 30 feet in length, but such dimensions are naturally never reached in Bangkok. Flower mentions one killed in 1897 that was 20 feet long. The largest I know of myself measured $16\frac{1}{2}$ feet. Specimens of 10 to 12 feet are fairly common and are often hawked in the streets where they realize a few ticals for the sake of their gall-bladder and skin. The former is accounted a valuable remedy for colic as well as for various other complaints.

A python that has newly cast its skin is one of the most handsome of snakes. No description can give any idea of the beautiful sheen and the play of metallic tints of blue and green which sparkle from every part of the body, colours which, alas, it is impossible to preserve after death.

Color and markings (in life). Above, light brown with a dorsal series of large darker colored spots, circular, oval, or rhomboidal in shape, sometimes confluent. Each one is edged with black and outside again with yellow, these two colors descending upon the sides in a regular series of V shaped marks each of which encloses a white spot. Below, whitish or yellowish, dappled with brown at the sides. A black streak along the middle of the head, and one on each side, from the eye to the corner of the mouth: *Python reticulatus* has the rostral shield and the first four upper labials deeply pitted. This will serve at once to distinguish it from the other two species of python, *P. molurus* and *P. curtus* which are found in this part of the world and have only the first two labials pitted. *P. molurus*, the common Indian python, has been recently found at Lopburi. *P. curtus* has not yet been discovered but it probably exists in the Peninsula.

Habitat. Burma and Indo-China to the Malay Peninsula and Archipelago.

Family ILYSIIDÆ.

5. *Cylindrophis rufus*.

Siamese. งูหิน ทู (ngù kon khop). Very common in Bangkok. Found beneath logs of wood or in heaps of earth or dead leaves, or in holes in the ground. Frequently to be met with crossing the roads

on wet nights, It has a curious habit when molested of coiling itself up with the head hidden beneath a fold of the body and the tail curled, up over its back, somewhat after the manner of a scorpion. This attitude to one who does not know it, is highly intimidating, and has given rise to its vernacular name, "ngu kon khop," the snake that bites with both ends. The tail is extremely short and blunt, and the body being of almost uniform diameter throughout, it is easy for a casual observer to mistake one end for the other. To the Malays it is known as the "ular dua kepala," the two-headed snake. It is considered highly poisonous, but is, as a matter of fact, a most inoffensive creature. I have never yet known one to bite—even when newly caught.

Food. Eels and other snakes. Its appetite is gargantuan. It seems to prefer a meal at least as large as itself, if not larger, and the manner in which it can pack its food away and appear but little bigger afterwards is extraordinary. One I had in captivity, itself 400 millimetres in length, overcame and devoured a Keel-back (*Tropidonotus piscator*) of 500 mm. (20 inches), the latter snake being well known for its activity and aggressiveness. Another was found having just swallowed a water-snake (*Homalopsis buccata*), the former 780 mm. long and the latter 925 mm. Two other specimens were caught in the water in the act of swallowing eels, their prey on each occasion being several inches longer than themselves. I could quote many other instances only a little less voracious.

In captivity it is an uninteresting creature, burrowing at once into the soil of its cage, and never re-appearing except under cover of darkness. At the same time it would appear to be by no means nocturnal in its habits, as the records of its appetite show, all of which events took place in broad daylight.

Length. Boulenger gives it up to 825 mm. The largest specimen I have seen measured 865 mm. (34 inches) in total length, the tail contributing 15 mm. only.

Colour (in life). Iridescent black to dark purple-brown, the latter colour being found only in adults. The belly is marked with a series of dull white or pinkish cross-bands, about as broad as their corresponding inter-spaces, and interrupted at the mid-line. In the young, another series of narrower bands travels upwards on to the

back, but become gradually obscured in later life, although by careful examination traces of them can usually be found. The tail has a reddish or orange mark, and there is often a collar of the same colour.

Family XENOPELTIDAE.

6. *Xenopeltis unicolor*.

Siamese. งูแสงอาทิตย์ (ngu saang athit). The largest of all the burrowing snakes that inhabit Bangkok, where it is fairly common. It is found frequently in the saw-mills, hiding away in the stacks of wood or beneath the squares. It is found also in the gardens when turning up the ground, and beneath heaps of leaves and rubbish. In loose soil it can burrow rapidly and easily, and in captivity, like the preceding species, usually disappears immediately into the earth of its cage. It appears to be entirely nocturnal in its habits. It is an active powerful snake and when first caught, although it will make violent efforts to escape, and wrap itself round one's hand and fingers with great constricting force, does not attempt to bite. It has the curious habit when excited of vibrating the tip of its tail with great speed. The habit is by no means confined to this species, but with *X. unicolor* it is so strongly and rapidly performed that I have at times thought I could actually hear the vibrations.

The Siamese name, "ngu saang athit," the sunbeam snake, is well deserved. The high polish of every scale in its body, and the beautiful tints, chiefly of sapphire blue and emerald green, which flash forth from the upper surface (although the actual colour is uniform black or dark brown), make it a very striking creature in appearance.

Food. Rats, mice, frogs and other snakes.

Dimensions. Grows to a length of 1200 mm. (4 ft.). The tail is very short, measuring only about one-tenth of the body length. The largest Bangkok specimen I have seen measured from snout to vent 860 mm., tail 75 mm.

Colour (in life). Above, from black or an intense bluish black to chocolate brown, uniform, the last 3 rows of costal scales being edged with white. Beneath, white, immaculate, except for the sub-caudal scales which are edged with dark grey. The young are black above with a white or yellowish collar extending on to the occiput.



Acrochordus Javanicus (The Elephant's Trunk Snake).

This collar entirely disappears as the snake grows up. The change to brown takes place later in life, and is confined to adult age. Whether it occurs in all specimens I cannot say. My own experience in Bangkok is that it does so.

Family COLUBRIDAE
Subfamily ACROCHORDINAE

7. *Acrochordus javanicus*. The Elephant's Trunk Snake.

Siamese. งู งู นก ช้าง (ngu nguang chang). Fairly common in Bangkok, inhabiting the river and klongs. Often caught in the mud left by the receding tide. Occasionally to be found crossing a road, but on land it is quite out of its element and its movements are slow and clumsy, progressing as much like a gigantic worm as like a snake. As with many of the fresh water snakes, it has an extremely sluggish disposition, at any rate during the day time. In captivity it hardly ever moves except under cover of darkness. If handled quietly it makes no attempt to bite, but if roughly seized will turn swiftly upon one, and with its large teeth can inflict severe wounds.

Food. This consists chiefly of fish, but it is possible that this species is also vegetarian in its diet. In the stomach of one caught in Java,* a quantity of undigested fruit was found, and in one caught in Bangkok I discovered a curious conglomeration of small hard nuts, small stones, a large piece of string, as well as a quantity of fish bones. Such things could only have been swallowed accidentally, or more probably were in the stomach of some creature eaten by the snake. I am not sure that it will not eat carrion. Further observations upon its diet will be interesting.

It is a prolific snake. Cantor mentions one in his possession which brought forth 27 young ones, and two others which I examined towards the end of May contained respectively 27 and 32 well developed embryos.

Dimensions. Up to 2500 mm. (Boulenger). The largest specimen I have seen measured 1835 mm. (6 feet). For its length this snake has enormous girth, greater than that of any other snake I know. This point is well brought out in the very excellent plate, reproduced from a photograph taken while the creature was alive

* Vide Boulenger's *Reptilia and Batrachia of the Malay Peninsula*.

Color (in life). When first caught it is usually not sufficiently clean to make out any definite markings, but the actual coloration (after washing) will be found to be as follows. Above, dull brown or greyish brown, paler below, and with a line of dark, circular or or oblong blotches on either flank. These markings, the great girth, and the loose, baggy skin covered with tubercles, instead of scales, serve to distinguish this species quite easily from all others. Its title of the Elephant's Trunk Snake is a very appropriate one.

Habitat. Siam and the Malay Peninsula, Java and New Guinea.

8. *Chersydrus granulatus.* Closely allied to the preceding, but much smaller. Flower in his list mentions a specimen which was in the Museum during his time and was labelled "Bangkok." This snake is an inhabitant of river mouths and the adjacent sea-coasts. It is common at Tacheen where it is often caught with the fish at the stakes. It is not unlikely therefore that one may occasionally be carried up here by some unusually high tide or upon some fishing boat. It can, however, only be looked upon as an accidental visitor.

Subfamily COLUBRIDAE.

9. *Tropidonotus piscator.*

Siamese งู ตาย คีบ (ngu lai saw). Very common in Bangkok, being plentiful everywhere, especially in the padi-fields during the wet weather. It is far and away the commonest snake that is met with when out snipe shooting. During the hot weather it is not much in evidence, confining itself to the banks of klongs and pools; but with the advent of the rains and consequent flooding of the fields it roams about all over the country, finding everywhere abundance of its favourite food—frogs and fish. It makes no attempt to kill its prey, but proceeds at once to swallow it alive, and the pitiful cries of the frog as it is slowly engulfed must be well known to everyone who has spent much time in the fields.* Fish it will devour with great voracity, and in the small puddles that form as the ground dries up and where the fish get herded together, it may be found making huge

* This procedure may seem extremely cruel, but, after all, Nature has not provided the snake with any other means of disposing of its prey.

meals. It is a good swimmer and is never found far away from water. It appears to be entirely diurnal in its habits.

In disposition this snake is bold and aggressive, striking and biting fiercely when molested, and with its sharp teeth being able to inflict quite severe wounds, even through gloves. In captivity, however, it quickly grows accustomed to being handled, and after a short time makes no attempt to injure one.

Length. Up to 1200 mm. (4 feet), the tail forming one third or one quarter of the whole. The largest Bangkok specimen I have seen measured, snout to vent, 960 mm., tail 240 mm.

Color and markings. In coloration this species, which is widely spread over the East, shows great variation, so much so that if they were to be judged by their markings alone, they would be frequently considered as different species. Major Wall* in an article upon this snake endeavours to arrange them into ten different varieties. Many of these however merge so gradually into each other that it is impossible to draw any definite line between them. The following description applies to Bangkok, and as far as I am aware to the rest of Siam.

Above, olive brown or green, with black spots arranged quincuncially, those upon the sides being longer than the others, forming a series of short transverse bars. The spots vary considerably in different individuals. They may be so indistinct as to be almost absent, or so large as to almost obscure the ground color, or they may be linked together forming a network. Bright scarlet markings often exist upon the sides. Beneath, whitish or yellowish, each ventral and subcaudal scale being edged with black. An oblique black streak below the eye, another behind it. A chevron-shaped mark, more or less apparent upon the neck. Interstitial skin usually arranged in black and yellow reticulations, the yellow often extending on to the adjacent scales.

Habitat. India, Burmah and S. China to the Malay Peninsula and Archipelago.

10. *Tropidonotus sub-miniatus.*

Siamese. งู คบ แดง (ngu khaw daang). Quite as common as

* *Journal, Bombay Nat. Hist Society, Vol XVII, No. 4.*

the preceding, but more an inhabitant of gardens and garden land. Very similar also in habits but less aggressive. This snake has to a marked extent the power of flattening its body, which it does when caught or excited in any way. It feeds chiefly upon frogs and in captivity quickly becomes tame.

Length. Up to 1000 mm.

Color (in life). Above, brown, uniform or with small black spots arranged across the vertebral line in pairs, or connected forming short cross-bars. Head, olive green, with a black streak below the eye. For about 5 centimetres upon the neck there is a patch of bright vermilion. The interstitial skin of this snake is extremely handsome, being arranged for the most part in a network pattern with the meshes alternately black and yellow. This shows up strongly when the snake expands its body. The young have an olive-grey head, with a black patch across the nape and a yellow collar behind it. Identification is easy, in life, the red colour upon the neck serving to distinguish it at once. In spirit this mark disappears very rapidly.

Habitat. Eastern Himalayas, Burma and S. China to the Malay Archipelago.

11. *Tropidonotus stolatus.*

Not previously recorded from Bangkok. Dr. Robert has a specimen which is said to have been caught here. This little snake has a wide distribution in the East and is possibly more common in the North of Siam.

12. *Lycodon aulicus.*

Not very common. Found generally in the neighbourhood of houses and often inside them, hiding itself away during the daytime in any available hole or crevice. It is a good climber and appears to prefer the roof to the floor. In disposition it is an active, excitable creature and has a most vicious temper, striking and biting freely whenever caught, but being quite unable, on account of its small size to do any damage.

Food. Chiefly geckoes, but also other species of lizards.

Length. Boulenger in his *Fauna of the Malay Peninsula* gives the total length as 510 mm. Wall states that they grow up to 750 mm. in length, but remarks that specimens over 600 mm. are rare.

His measurements refer to specimens in India. The largest one that I have seen, taped 600 mm. in total length the tail forming 105 mm. This snake is very variable in its markings, but I have up to the present seen only one variety in Siam, although I have examined specimens from widely separated parts of the country—Chiengmai, Den Chai, Lopburi, Bangtaphan and Siracha. It accords precisely with Boulenger's description of the one found in the Peninsula. It would appear therefore that the variety found in this region does not grow as large as the ones found in India.

Color (in life). Above, greyish brown, with fine pale yellow (in spirits, white) reticulations, sometimes arranged upon the back as distinct cross bars. A triangular yellowish blotch on either side of the occiput, which may be fused into a collar. Upper labials white or yellowish, each scale with a dark spot. Beneath, greyish or whitish.

Habitat. India, Ceylon, Burma and Indo-China to the Malay Archipelago.

13. *Psammodon concoloratus*.

Major Wall calls it the Indo-Burmese Sand-snake* but in no way can the title be considered particularly appropriate to this locality. This handsome snake has not previously been recorded from Siam, its nearest known habitat being Pegu and Bassin in Burma. It is not common in Bangkok. At Sala Deng, on the waste land commonly known as "the Ditches," there is a small colony, and I have seen specimens from other parts of the town. My acquaintance with this snake alive is confined to the colony just mentioned, and to a certain time of the day when, after heavy rain, the sky clears for an hour or two before sunset. Then, as if seeking to dry and warm themselves, they climb to the topmost boughs of the bushes amongst which they live, and bask in the departing rays. They are very shy and unless approached with great caution dive like a flash into the undergrowth below and are lost to sight. I have only once met one on the ground. This was by the side of a Klong, in the heat of the day, and it took without hesitation to the water and escaped. When caught first

* Journal. *Bombay Nat. Hist. Society*, Vol. XX, No. 3

they bite fiercely, and although they always retain a certain amount of their shyness in captivity, do not attempt to bite afterwards. Those I have kept lived invariably upon a branch or bough placed in their cage, and seldom descended to the earth.

Food. Further observations on this point are wanted. Major Wall says he knew of a frog taken once, and lizards (*Mabuia*, *Culotes*) twice. I have found a small mouse in the stomach of one. At "the Ditches" lizards of any kind are seldom met with. Frogs abound, except in the driest months. The undergrowth there is extremely thick for the greater part of the year, and during the December floods the whole place is usually under water. In captivity mine refused all food.

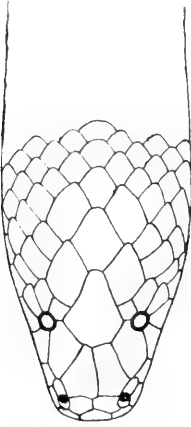
Length. The largest specimen I have seen measured 945 mm. in total length, the tail being 225 mm.

Color (in life). Above, buff, with four well defined dark brown stripes, each $1\frac{1}{2}$ scales wide and edged with black, passing down the entire length of the body and tail. The two median lines commence at the internasal shields, the two outer pass through the eye and along the flank. In some specimens the inner margins of the median stripes become obliterated, and in a large female in my possession these bands are fused into a single broad one. Below, yellowish white, with a fine black line at the margins of the ventral shields. Upper labials, whitish. The whole snake has a fine polished appearance, and the body is particularly solid and compact. Interstitial skin in life, is never visible.

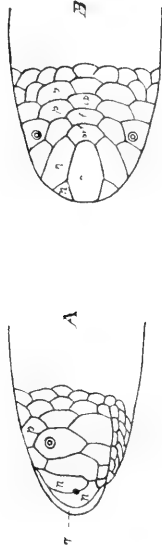
Habitat. India, Burma and Siam.

(To be continued.)

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Xenopeltis unicolor.



Typhlops braminus.

A. Side View. B. Upper Surface.



Tropidonotus piscator.



Psammophis condanatus

NOTES ON THE RACES OF SEROW, OR GOAT-ANTELOPE, FOUND IN SIAM.

BY A. J. IRWIN.

At the Meeting in June last the skin of a very fine specimen of the Serow or Goat-Antelope was exhibited, which had been shot at Koh Hlak by Mr. Butler, and I noticed then that the colouration differed somewhat from that of other specimens I had seen. I had previously been of the opinion that more species or sub-species than one of this animal are to be found in Siam, and I am now sure that this is so. As the matter is of considerable interest, I have prepared the following notes in the hope that they may be of use in identifying these species or sub-species.

Briefly, it may be stated that the Serows belong to a group of ruminants including the Serows, Gorals and Takins, which inhabit the hilly and mountainous districts of northern and eastern Asia, and are popularly known as the Goat-Antelopes. The two latter genera do not concern this paper, but it may be mentioned that the Serows differ from the Gorals, their nearest relations, in their larger size, their greater length of limb but shorter tail, and in the presence of a special gland on the face, in front of the eye. This gland, although not very noticeable on the outside, is sufficiently large to form a deep impression on the bone beneath, and can be readily distinguished in the skull of any Serow, just in front of the orbit. The ears are long, the body covered with sparse, coarse hairs, almost amounting to bristles, and there may or may not be a wild bristly-looking mane.

In colouration the Serow is very variable and it is owing to this fact, and to the lack of a sufficient number of specimens for examination, that confusion has arisen between the various authorities who have attempted to describe the animal. The latest authority to write upon this subject is Mr. R. I. Pocock, Superintendent of the Zoological Gardens in London, who has described* no less than 8

* Journal of the Bombay Natural History Society, Vol. XIX, No. 4 and Vol. XXII, No. 2.

races, ranging from Sumatra to China and the Himalayas. He declines to recognise them as different species and remarks, "I have a strong suspicion that when the Serows are better known, that is to say when more material has been collected, gradations will be traced and thus justify the view I now hold that all the Serows ranging from Kashmir to Burma belong to one locally variable species. But," he continues, "I am not sure that future discoveries will not show that the Serows of the Straits Settlements should rank together with the Sumatran animal, as specifically distinct."

I propose, in this article, to confine myself to those races of Serows which have been already described from this region, that is to say from the countries adjacent to Siam, and to show afterwards how they differ from the ones I have met with myself.

It may be as well to remark at this point that Mr. Pocock has re-introduced the generic title of *Capricornis* for the Serows in the place of *Nemorhaedus*, which has been used by Blanford, Lydekker and other authorities for many years, and gives his reasons for so doing on the grounds of priority. It remains to be seen whether or not his new term will be finally accepted.

In the following descriptions I have not hesitated to quote freely from all the authorities at my disposal. The last variety to be described, although stated to be found in countries far removed from Siam, has been included here as, in colouration, it approximates very closely to specimens that have been found in this country.

1. *Capricornis sumatrensis robinsoni*. Pocock.

Prevailing colour black, with a thick grey crest-like mane on the neck and withers, composed of a mixture of black and white hairs. Areas of the leg below the knees and hocks black, turning to brown only on the fetlocks.

Distribution. Selangor and (?) Perak.

2. *Nemorhaedus sumatrensis swettenhami*. Lydekker.

Capricornis sumatrensis swettenhami. Pocock.

General colour black, the back strongly and the sides slightly grizzled with grey, the bases of the hairs being whitish. Along the lips whitish grey: the posterior portion of the upper lips, a part on each side of the lower jaw and one on the throat rusty red. Ears black, grizzled with rusty at the base, and lined and edged with greyish

white hairs. Mane black, mixed with whitish hairs on the fore part of the neck and with reddish hairs towards the withers. Insides of the thighs rusty red. Remainder of head, neck, chest, belly, and legs black. Tail black.

Distribution. Perak.

3. *Nemorhaedus sumatrensis*. Blanford.

Nemorhaedus sumatrensis rubidus. Lydekker.

Capricornis rubidus. Blyth and Pocock.

Prevailing colour red all over, paler beneath, a blackish spinal stripe, extending to the tip of the tail. Chin, lower jaw and upper end of throat white. Whitish on the fetlocks and sometimes on the knees.

Distribution. Assam to Salween.

4. *Nemorhaedus sumatrensis*. Blanford.

Capricornis milne-edwardsi. David and Pocock.

Brownish black or blackish, sometimes hoary, some reddish hairs intermixed on the outer side of the thighs, the legs below the knees rusty red throughout.

Distribution. Eastern Thibet, Burma (Moulmein, Pegu).

5. *Nemorhaedus bubalinus*. Blanford.

Nemorhaedus sumatrensis bubalinus. Lydekker.

Capricornis thar. Ogilby.

Capricornis sumatrensis thar. Pocock.

Prevailing colour coal-black with the hairs basally white, legs whitish or grey-white below the knees and hocks, the belly dirty greyish brown or not clear white.

Distribution. Nepal, Sikhim and Chumbi.

This species is very far removed from Siam, but is introduced here for the reason already mentioned.

The description of the animal shot at Koh Hlak by Mr. Butler, which appears to be an unusually large specimen, is as follows:—

Prevailing colour above black, much grizzled on the dorsum owing to the basal half of the hairs being white, less grizzled on the flanks. Belly and upper part of the limbs and buttocks brownish black, the legs from the knees and hocks downwards rusty brown. The mane is grey, being composed of black and white hairs, the white

markedly predominating, and with the longer hairs tipped with light brown. It is mat-like and of great length, some of the hairs being as much as 12 inches long. There is a jet-black, dorsal crest reaching to the tail. Sides of neck and face black, upper surface of head the same, but with some reddish hairs intermixed. Throat reddish grey, lower lips, chin and inside of ears whitish.

I have hunted Serow at various places in Siam from Lat. 15° N. above Lopburi to Lat. $11^{\circ} 48'$ N. below Koh Hlak in the Peninsula. Except in the case of one Serow, which I shot near Koh Hlak, the colouration of all the specimens seen by me was black on the upper parts of the body, interspersed with white hairs on the back—these becoming more numerous on the breast between the forelegs, along the belly and under the edges of the tail, which is thus sometimes fringed with white; from the knees and hocks downwards very light grey, or dirty white shading into grey on the front of the forelegs; the muzzle not noticeably grey; no fawn or red hairs at all anywhere on the body or legs. The animal shot by me near Koh Hlak was coloured as above described, with the exception that the legs from midway between the elbow and knee joints, and midway between the stifle and hock joints downwards, were a reddish grey owing to the mixture of a preponderating number of red hairs with the white.

From the descriptions I have given above I submit that there can be no doubt whatever that at least two distinct races of Serow inhabit Siam, the distinguishing marks being that one race has no rufous colouration at all, while the other has a considerable amount of such colouration. I have never heard of the rufous variety occurring in Siam north of Latitude $12^{\circ} 40'$ N.; all the specimens I have seen or heard of from the north of that line have had only black and white hairs in their pelts. The information at my disposal leads me to think that the Serow without any rufous colouration at all, being simply black and grey or white, with dirty white or grey legs, may be a sub-species which has not yet been described by anyone as a distinct race. From the description already given of *thar*, it appears to be most closely allied to that animal, although the known habitat of *thar* is very far removed from Siam.

The measurements of a fullgrown female Serow which I shot near Na Yang, about Lat. $12^{\circ} 45'$ N., Long. $99^{\circ} 55'$ E., in Petchaburi district in 1910, were, from tip of nose—not much stretched

out—to end of tail 60 inches, and height at shoulder 36 inches. I should say the weight would have been about 140 lbs. The horns of a male and of a female shot by me measured $8\frac{1}{2}$ inches and $8\frac{3}{4}$ inches, respectively, in length along the outer front curve. The depth of the curve, which is but slight, would be only about an inch between the inner side of the curve and a straight line drawn from tip to base. I should say that any horns over 9 inches in length would be quite exceptional in Siam.

I can see no great difference in the size, weight of body and length of horns of the male and the female Serow. In both sexes the tail is very short, not longer than 6 inches as a rule, while the ears are large, about two-thirds as long as the horns. The neck is short, and carries a short dark grey mane of coarse, straight hair, as a rule erect and about 6 inches long, which extends to between the shoulder blades, where it shortens in length to a ridge of longish hairs along the backbone. The hair of the body generally is coarse, and does not form a very thick coat in this climate, but probably it is longer and thicker in a colder one. On Mr. Butler's specimen the hair seems to me to be longer than is usual. Possibly this is because the other pelts I have seen were those of animals shot in the hot season, and his specimen was shot in November towards the end of the rains. The hair may grow longer in the wet and cold season, and may be moulted in the dry season. The young Serow are darker than the old ones, which become somewhat grey owing to the increase of white hairs among the black. I have never seen a Serow with a beard like a goat, an animal which, on a large scale, it resembles. The legs are remarkable for the thickness and strength of their bones compared with the size of the animal, appearing to measure more below the knees than those of a Sambur deer. The feet are not big in proportion, but are small and compact, not splayed. The bones of the legs gave me the impression of being extra hard and close-grained in texture. The iris of the eye is a very dark blue.

In Siam the Serow inhabits steep and, in many cases, precipitous hills and low mountains, not, in my experience, exceeding 1500 feet, and generally much lower. Personally I have never seen or heard of it on any except those of limestone formation. It is not very markedly nocturnal in its habits, though said to be as much so as the Sambur deer, but moves about, to some small extent at all events, in

the day time. According to the general account of the natives, it hardly ever goes off the hills except when moving from a hill to a neighbouring one. I am inclined to doubt this as I have found its tracks in a clearing near the Prasak river a few miles north of Saraburi about half way between the hills and the river, which are there some two miles apart. I have also found its tracks in the paddi fields about half a mile from the hills near Na Yang in Petchaburi, and I have always been of the opinion that it only makes such expeditions at night, and then probably in search of water. I have been informed by Dr. Smith, however, that the Serow at Koh Hlak, when he was there in November 1912, regularly came off the hill in the early morning, and again in the afternoon as early as 4 p. m., and fed in a clearing at its base, with a couple of Chinamen often at work within 200 yards of them. One was shot feeding in a plantation by the sea-shore, at least 400 yards from the hill and within 100 yards of Mr. Butler's bungalow. The particular hill referred to is fairly thickly covered with vegetation at its base, much less so near the summit.

In every place where I have heard of Serow, except in the neighbourhood of Koh Hlak, there was at all events some possibility of their finding water in order to get an occasional drink. They certainly cannot need much water, however, and must be able to do without it for considerable periods. At Koh Hlak, for instance, I must say I do not understand how they can get anything to drink in the dry season, but the natives there have settled the question to their own satisfaction; they say the animals drink seawater.

I consider the flesh of the Serow very palatable; it is dark coloured and tastes not unlike good tender beef.

The Serow moves fairly fast on hills, but carefully as a rule, and going down hill often appears to be getting along slower than it really is, owing to its habit of looking before it leaps. The article in the Badminton Library on this animal says that "the Serow's chief accomplishment is the way he can gallop down a steep hill, and as he invariably takes that course when disturbed, he can be easily driven, provided the ground is well known." My experience is almost entirely the opposite of this, as I have found that it always seeks the high tops of the hills when driven. Going up hill it does not seem to bound or jump or gallop, but goes rapidly upwards in a sort of even running scramble, dodging obstacles and giving one the impression

that it is being rolled rapidly on wheels. It is said to have the habit of depositing its dung in some particular spot, like the Rhinoceros. I think this is true, in the neighbourhood of their lairs at all events. I have found the lair of a Serow with a very large accumulation of droppings heaped up about 10 yards away from it, with a well beaten track from the lair to the heap.

The most remarkable thing I have noticed in connection with these animals is the quite extraordinary roar which they can emit when wounded, or possibly when angry. When hunting near Khao Kiou, west of Potaram, in Muang Ratburi, one of my beaters shot a nearly fullgrown male Serow. It was so badly wounded as to be unable to move, and died in a few minutes. After being hit it emitted two or three long roars which conveyed a great volume of sound and quite an appalling idea of ferocity and rage; so much so that until I actually saw the animal I could not believe such a noise could be made by a Serow, and thought that the shot must have wounded a tiger. I was less than two hundred yards from it at the time and went at once in the direction of the sound; it was dead when I reached it. A native of the district who was standing near me when it roared assured me, without hesitation, that the noise was made by a Serow, so presumably he had heard it on previous occasions. The author of the article on Serow in the Badminton Library mentions "the discordant scream of the Serow heard after dark." Colonel Kinloch quoted by Blanford says, "when disturbed the Serow utters a singular sound between a snort and a screaming whistle, and I have heard them screaming loudly when they had apparently not been alarmed."

The Serow is accounted by natives, and I believe generally, a somewhat difficult animal to bag. In some places that I know of the natives have given up hunting it as they find it so hard to kill. It is a common tale that when wounded it licks the wound which at once heals, even if it is a broken leg!

I should say from what I know of hunting them near Koh Hlak that they were not difficult to bag in that neighbourhood, the hills they frequent there being small so that the animals can easily be driven from one to another, and shots thus obtained at short range. From the experiences of Mr. Butler and Dr. Smith, it also seems to be fairly easy to stalk them there when they are feeding at the base of the hill. On larger hills it needs a certain amount of knowledge

of the game, and well arranged driving, to get a shot at one at all. If seen moving on a hill they can be stalked; the difficulty is to see them.

In districts where they have not been much hunted I believe they are quite capable of charging persons blocking their line of retreat from danger. The Badminton Library states that "all writers agree that a wounded one will charge." Kinloch says "the Serow is a fierce and dangerous brute when wounded and brought to bay." I have known of one breaking back through a line of beaters placed close together.

In Muangs Petchaburi and Pran the natives commonly refer to the Serow as "Khoram" (โควรัม) which reminds one of the name "Gooral" given in India to the *Nemorhaedus gooral*, a smaller animal of the Serow tribe. There may be some connection between the names. The ordinary Siamese name for the Serow is "Liang Pa" (เลี้ยงป่า). The Laos near Kok Katiem, north of Lopburi, whose ancestors came from Chiengrai, call it in their language "Yuang."

+ NOTES ON THE FAUNA AND FLORA OF RATBURI AND PETCHABURI DISTRICTS.

BY K. G. GAIRDNER.

INTRODUCTORY.

The subject of this paper is the Fauna and Flora of Ratburi and Petchaburi, in which districts I have been working for the past few years; but unfortunately, from the zoological standpoint, have only been taking notes of specimens obtained during the past two years; viz., 1912-1913.

The area in question lies between N. Lat. $12^{\circ} 40'$ and $14^{\circ} 10'$ and E. Long. 99° - 100° . It is, of course, within the Oriental region bordering on the Indo-Malayan sub-region, and the Fauna is practically the same as that found in the adjoining Province of Tenasserim.

The country under review may be roughly divided into five fairly distinct classes, namely:—

1. The coast line in the N. W. corner of the Gulf of Siam, about the mouths of the Ratburi and Petchaburi rivers, with a belt of tidal mangrove swamps varying in width, but at no point more than 7 miles wide.

2. The alluvial paddy plains, with a soil generally lighter than that around Bangkok; and with abrupt limestone crags standing up from the plains.

3. The slightly undulating country with isolated hills and small ranges; and covered with various classes of jungle, chiefly deciduous.

4. The foothills covered with mixed jungle, deciduous and evergreen, and

5. The continuous mountains running up to the watershed dividing Siam and Tenasserim, covered with dense evergreen jungle.

The varying classes of country have each their fairly distinct populations. Along the coast are Siamese and Mons, with a number of Chinese in the larger centres engaged in fishing and cutting of fire-wood and attap.

In the paddy plains are chiefly Siamese, with colonies of Lao Puan and Lao Wiang intermixed; and, usually on the outskirts of the true plains, are found colonies of Lao Song, easily recognised by their distinctive dress and dwellings.

The third class of country is sparsely populated and is chiefly used by the inhabitants of the plains for the extraction of building material and fish stakes for export to the coast.

In the fourth class are found a few scattered Kariang hamlets; while in the dense evergreen forest, comprising the fifth class, are found the Karangs, who are really primitive Kariangs, using a somewhat different dialect and who, as a rule, cannot speak Siamese and sometimes fly from their dwellings on the approach of strangers.

THE COAST LINE.

In March 1909 I made a trip of some two weeks duration from Samut Song Kram to Petchaburi in small open boats, the coast line about there being only defined by the outer verge of mangroves, which are extending steadily seawards, and at low tide the mud flats are exposed for upwards a kilometre in breadth. At such times the fisher people go mud-sledging for shell fish, the sledge being composed of a box nailed to a plank, and the fisher, kneeling on the plank, uses one foot as a propeller.

South of Lat. $13^{\circ} 10'$ N. the character of the coast changes, until in Lat. $12^{\circ} 40'$ the limestone crags, which follow a general trend S. S. E., form seacliffs and islets. Between these points the coast is slowly eroding, judging from the Sugar-Palm trees I found either destroyed or growing on the verge of the sandy beaches. Having been warned that nothing lived on the mud coast, except mosquitoes, I foolishly took no gun.

At the mouth of the Meklong or Ratburi river I saw large families of Otters (species unknown) playing on the mud banks and among the mangroves at low tide; and along the coast, and principally in the creeks in the extreme N. W. corner of the Gulf, found the Crab-eating Macaque (*M. cynomolgus*) acting up to its trivial name—eating crabs and other small denizens of the mud flats, and generally enjoying itself swimming and diving in the brackish creeks. The fisher people complain that these monkeys frequently steal rice and other edibles from their houses. Whether they also steal drinking water, which the inhabitants have to bring from a considerable dis-

tance, I cannot say; if they do not, it would be interesting to find out whether they do drink, or find sufficient liquid in the fruits and leaves of the trees in which they live. Inland, the same species comes down daily to fresh water to bathe, and presumably to drink; and in captivity this Macaque drinks daily. This long-tailed olive-brown monkey is probably well known to all members, being the one most commonly seen in captivity.

The mangrove and other trees growing in the tideway were during the day-time black with Fruit Bats (probably *Pteropus edulis*)—the largest colony I saw extending for 300 or 400 yards along the coast. These creatures get restless towards evening, and before dark are on their way to the fruit gardens several miles inland, around the town of Meklong. If disturbed during the day, they rise in a cloud and take some considerable time to settle down again in the same spot.

The Whistling Teal (*Dendrocygna javanica*), associating in flocks of some thousands, lay idly on the open water and, having no gun with me, they never seemed less disposed to take alarm. As the tide receded, and the mud flats were exposed, waders and shore birds appeared in vast numbers, but I was unable to obtain or identify any of these. Stranded one day on the mud, I was much amused watching the numerous small crabs hurriedly feeding with their "hands," from behind their one enormous claw, raised in an attitude of defence. This species has but the one nipper, which extends right across the body; and he watches the enemy (all are apparently enemies) the while he tucks in from behind this defence, occasionally stopping for a second to remove an indigestible pellet of mud—also with his lesser left hand.

To members interested in the Fauna of the tideway, I can recommend that corner of the Gulf which is quieter and more secluded than any other part of the Coast, nor are the mosquitoes troublesome during the month of March.

THE PADDY PLAINS.

In the years 1908 and 1909 my work lay chiefly in the populous paddy plains. North-east of Ratburi are found the wide plains with scarcely a tree in sight—jungle and gardens only occurring in isolated patches or on the higher ground of the river banks. With the exception of a few Fishing Cats (*Felis viverrina*), Palm Civets (*Paradoxurus hermaphroditus*) and a species of Mongoose not yet

identified, large mammals do not exist, but I was told that wild pig are found in an isolated patch of low dense scrub on the borders of Ratburi and Nakon Chaisi.

The Javan Slow Loris (*Nycticebus tradigradus*) is generally distributed (though not common), but is rarely seen owing to its nocturnal habits. In four years I have seen but two. It is the only representative in Siam of the primitive Lemur family. Various writers state that this monkey is carried aboard Chinese vessels to raise a wind by whistling, and the Siamese name, "Ling lom" (Wind Monkey), leads one to suppose that the practice is recognised in Siam.

The Malay Tree Shrew (*Tupaia ferruginea*), commonly met with in Bangkok gardens, is generally distributed, and though included in the Natural Order *Insectivora*, is omnivorous and has, I hear, recently troubled coconut planters by attacking the heads of young plants.

A feature of the broad plains N. W. of Ratburi are the huge flocks of a species of stork which, from the peculiar "misfit" in the upper and lower mandibles, can only be the bird known as the Open-bill (*Anastomus oscitans*).

The Sarus Crane (*Grus antigone*, or "Nok karian") is not common. I have seen but two pairs of this graceful bird stalking about the plains. During the present year I have seen the same pair several times in a big swamp west of Ratburi, where they probably breed, the nest being placed on the ground. It is an unmistakable bird and probably well known to members, there being several in captivity in Bangkok. The general colour is dove-grey, with a brick-red head. It stands some 4 feet or more high, and is the only crane so far recorded from Siam.

Adjutant birds (*Leptoptilus dubius*), the Black-necked Stork (*Xenorhynchus asiaticus*) and the White-necked Stork (*Dissura episcopus*) are generally distributed in suitable localities—the White-necked Stork showing a preference for the small glades and open jungle of the third class of country rather than for the plains.

In 1909 I obtained 3 nestlings of the Black-necked Stork, and the survivor of these now acts as a watchman for Mr. W. G. Johnson in Bangkok. Mr. Nunn informs me that this bird feeds largely on snakes. The nest was placed in the top of a tree some 100 metres up the side of Khao Chao Lai

To the west of Nakon Chum station and the river are several big perennial swamps—probably an old course of the river—and in these are found many species of waterfowl, notably the Purple Moorhen (*Porphyrio poliocephalus*,) easily recognised by the hard red shield on the forehead. The Whistling Teal (*Dendrocygna javanica*) and the Cotton Teal (*Nettopus coromandelianus*) are found from January to July and are probably permanent residents, and I obtained the Garganey Teal (*Querquedula ciricia*) in February. The Bronze-winged Jacana and the Pheasant-tailed Jacana (*Metopidius indicus* and *Hydrophasianus chirurgus*) also occur—the latter I found in flocks during February and March. Both are known to the Siamese as “Nok Prik” (นกพริก).

In June I saw a brown Pelican, and since Blanford states that the Eastern White Pelican is only a winter visitor, this bird could only have been the Spotted-billed Pelican (*Pelecanus philippensis*). They are said to be common in Ratburi during the rains.

Flocks of the Large Cormorant (*Phalacrocorax carbo*) appeared in February; the smaller species I have only observed in the higher and more secluded reaches of the Petchaburi river.

Of the Heron tribe, the Pond Heron and Cattle Egret (*Ardeola grayi* and *Bubulcus coromandus*) are found everywhere—the latter chiefly in the open plains, but the Pond Heron even in the more densely wooded districts.

The Common Heron (*Ardea cinerea*) appears to be confined to the brackish swamps and may usually be seen from the train, north of Petchaburi.

Of the *Columbae*, the Malay Spotted Dove (*Turtur tigrinus*) is widely distributed, occurring in all classes of country except the dense evergreen forests. Practically every clump of bamboos contains a pair. The Red Turtle-Dove (*Oenopopelia tranquebarica*) occurs in large flocks and is also very common.

Among the Accipitrine birds two species of Vulture occur—the Black Vulture (*Otogyps calvus*), with red head, and the Indian White-backed Vulture (*Pseudogyps bengalensis*). The former is known as วรึง เฝ้าพระยา by the Siamese, who say that the common grey bird is the servant of the black one. The Kites are those seen around Bangkok, viz., the Common Pariah Kite (*Milvus govinda*) and the

+ Brahminy Kite (*Haliastur indus*). The tiny Black-legged Falconet + (*Microhierax fringillarius*) is fairly distributed, and the massive + Crested Serpent-Eagle (*Spilornis cheela*) may be found in the more isolated patches of cultivation.

Camping on the big river the most noticeable bird by day is + the Pied Kingfisher (*Ceryle varia*) which is most common; and at night and early morning the Crow Pheasants (*Centropus sinensis*, + Siamese นก ๒๓) betray their presence by hooting in unison. The country people state that they call the time, or "watches," regularly throughout the night or when the tide rises. The Indian Koel + (*Eudynamis honorata*, Siamese นก กาเหว่า) is another common bird frequently heard. Among Passerine birds, the gorgeous Black-headed Oriole (*Oriolus melanosephalus*) is one of the most noticeable, both on account of its brilliant yellow plumage and its fine whistling note. † The Magpie-Robin (*Copsychus saularis*) and the Shama (*Cittocincla macrura*) occur everywhere—the latter most frequently in bamboo jungle bordering on cultivation.

Snakes I took little note of, beyond the fact that the black Cobra is not nearly so common as I had found it in the swamps south of Prachin. When sheltering one day in a farmer's house, he showed me the dried fat and various other internal parts of cobras, some for use as external and others as internal remedies for cobra bite. This is interesting, in that the people of the New Forest in England believe that, for the bite of a viper, the best remedy is to split the creature open and apply its fat. Speaking of remedies for cobra bite, reminds me that the country people place faith in another remedy, viz., human excrement, no matter whose, mixed with the leaves of some herb, the Siamese name of which is "Phak bang" (ผักบัง). Part of the mess is taken internally, presumably as an emetic, and the remainder placed on the wound, when "perhaps the patient will survive."

In 1909 my work lay south of Petchaburi. The paddy plains are of less extent, and frequently the bunds are planted thickly with Sugar-Palm trees. A great deal of jungle is intermixed with the cultivation, and the fruit gardens are tangled and densely overgrown, the ground beneath being frequently carpeted with pineapple plants. Such country is, of course, most suitable for the smaller birds, which abound, and in addition to those already mentioned, the Siamese Laughing-

† Thrush (*Garrulax diardi*) is most plentiful. The Mynas are well represented as, in addition to the two species of Pied Myna found commonly in Bangkok (*Graculipica nigricollis* and *Sturnopastor superciliaris*), there are also the Siamese Myna (*Aethiopsar grandis*), with short crest and a white patch on either wing—the dun coloured house † Myna (*Acridotheres tristis*), whose Siamese name, สัตถิคา, closely resembles the Burmese name for the Talking Mynas; the migratory † Chinese Myna (*Sturnia sinensis*)—a light grey and white bird seen in Bangkok during the winter months; and the Grackle or Talking Myna (*Eulibes sp.*, Siamese นก ขุนทอง)—a handsome black bird, with yellow wattles.

Hares are plentiful on the higher ground and presumably belong to the same species as that founded on Mr. Lyle's specimens, which have been classified as *Lepus siamensis*. They are snared, driven, and also shot at night by the aid of a lantern.

In this second class of country occur the abrupt, jagged-topped limestone hills. These are the home of the Goat-Antelope (*Nemorhaedus* or *Capricornis sp.*) or "Lieng pa;" and having only seen one adult and one dead calf, I will not attempt to describe a very variable species. I have found the droppings on nearly all the limestone hills in Rathuri and Petchaburi, and I have always regarded the animal as a very alert one—quite unlike the apparently rather tame creature which has several times been shot at Koh Lak in Muang Pran. The dead kid was probably less than two months old, and was well covered with soft black hair, with a pure white patch at the base of the neck between the fore legs.

On these hills, also, may be found a Langur, one of the leaf eating monkeys (*Semnopithecus sp.*), black in colour, with poll and tail French grey. It has also bare rings around the eyes, of a pinkish white.

It is a curious fact that tortoises abound on even the steepest of of these abrupt hills. Seen in captivity in Europe, the tortoise is a sluggish animal, feeding on succulent vegetables and grasses, and apparently a creature best fitted for a life on the flat. Hills of 100-300 metres elevation, both in the second and third classes of country, have seldom been visited without several tortoises having been found and brought into camp for food, and the coolies call them "Tao

Whaie" or "Tao Pek." These rocky and stony hills are as a rule sparsely covered with a small Bamboo (Siamese, "Mai Ruak") and trees of the *Shorea obtusa* and *robusta* species, with scattered clumps of coarse grass and a few deciduous trees and shrubs. But in the dry season the vegetation on these hills is baked brown; and generally jungle fires sweep over them annually. Live tortoises have been found with their shells scorched, and except for the dead leaves, fallen from the trees, it is hard to find what they feed on during the dry months of February, March and April. Two small ones brought into camp, and tethered by the hinder edges of the shells, died in 36 hours though not exposed to greater heat than they experienced on the hills, but death was probably due to exhaustion from tugging at their tethers.

The Flora of the more precipitous limestone crags is peculiar and mostly deciduous—the yellowish brown appearance of the hills in the dry season being strikingly different to the bright green of the rains. Many of the trees flower in the dry months and have acquired a bulbous trunk, presumably for the storage of moisture.

A species of cactus grows up to an elevation of 400 metres—the branches being triangular in section, and both this and the flat oval-branched species occur on the wastes near the coast. Brandis, in his work on Indian trees, only mentions the branched species (*O. dillenii*) or Prickly Pear. Whether or no the three-sided species has been more recently introduced, and not yet run wild in India, I cannot say. A third species, observed only near habitations, has branches up to 1 metre in length, and in section the branch is six-winged, the flutings being about 5 cms. in depth.

Ground orchids, and the tree orchids which occur, are not conspicuous. Small maiden hair ferns, either deciduous or annual, spring up as the rains commence.

THE SLIGHTLY UNDULATING COUNTRY AND THE FOOTHILLS.

The third and fourth classes of country insensibly merge one with the other, and since the Fauna are the same or migrate from one to the other according to season, I will take both together.

Continuing with the Flora. The magnificent "Ton yang" or Wood-oil tree, growing on the river banks or near underground water, as a rule does not occur below the 6 metre line, and rarely extends above the 80 metre line from sea level, where it is replaced by *H.*

odorata ("Ton takien") of the same Natural Order. This lines the river banks up to a considerable elevation, usually springing from the bank at summer level, and is used by the Kariangs for making their dug-out canoes.

Of the *Dipterocarpace* or "Ton yang" family, I only identified one (*D. alatus*), but I remember hearing the name ^{ไม้พุดวง}, so probably *D. tuberculatus* also occurs.

Large areas occur of the gregarious "Ton teng" and "Ton rang" (*Shorea obtusa* and *siamensis*) and from these areas have been cut most of the sleepers for the Southern Railway. Growing on light rocky or stony soil, the ground beneath these trees is usually clear of undergrowth, except short tufts of grass and a peculiar tree fern with a trunk from 2-3 feet high. Notwithstanding annual jungle fires, these tree ferns burst into leaf, and a species of lily flowers, immediately after the first few rains at the end of April.

Another noticeable tree is the *Xylia dolabriformis* which produces the ^{ไม้แดง} and which, in common with some other Mimosas, has a sweetly-scented flower in March, and a big seed pod, which is frequently heard in January and February suddenly bursting open with a pistol-like report.

In the same Natural Order is another timber tree—the ^{ต้นประดู่} (*Pterocarpus indicus*), which I have found at elevations of 300-400 metres

The Teak tree (*Tectona grandis*) does not occur, in a natural state, this side of Siam, south of 14° 20' N. Lat., where I found it gregarious; but it is frequently planted in the area under review, noticeably at Potaram.

At Khao Pah Lai, south-west of Petchaburi, I found a species of true Pine (*Pinus merkusii*) at an elevation of 400 metres, growing on bare exposed ridges. This species is recorded by Brandis from the Shan States of Burma and also from Sumatra. It is an unmistakable tree, being the only pine in which the leaves occur in clusters of two; but the trees were stunted and poor—having a diameter of only one-third that given by Brandis.

In these two classes of country are found the great majority of the mammals occurring in this area.

Among the Primates, the Agile Gibbon (*Hylobates agilis*) I believe occurs, being replaced in the mountains by *H. lar*. The Crab-eating Macaque is found, generally not far from running water, and also the Pig-tailed Macaque (*M. nemestrinus*) of the same olive-brown colour as the last, but with a tail of some 7-8 in. only; it has not yet been observed at any considerable elevation.

The Northern limit of the Langur already referred to on page 33 seems to be N. Lat. 13° 20' and it is generally distributed in the plains and the highest mountains. The animals obtained in the plains appeared smaller and darker in colour. North of Lat. 13° 20' I have never seen it, but its place is taken by a griggled black species, with silvery grey whiskers so long that the ears are almost concealed. I have not yet been able to identify this species, but it was very common in the Me Pachi valley and I had considerable opportunities for observing it during this year. The very young ones are light reddish fawn, with blue eyes, and the dark colour of the adult first appears on the crown of the head. The young were, on 11th April, about 7 in. long and were able to leave their mother and play among the bamboos. This and the previous species have a large vocabulary, ranging from a loud hoarse indescribable bark to a nasal "Kum on," which is repeated with emphasis if the young do not "come on," but they differ from the former species in that they frequently hoot at night. The young are never still, and while their elders are having a midday siesta in the denser tree tops, the young play in the lower branches, and on one occasion an adult came down to stop the uproar below. Both these species will endeavour to micturate on passers-by, whether out of contempt or for other reasons I cannot say, but it is not done through fear in most cases.

Frequently the Langurs and Macaques were feeding together and at such times the Macaques discovered me before the Langurs; more frequently a squirrel gave me away, starting a squittering note of alarm.

The Carnivora are well represented. Tigers, leopards, fishing cats and civets (*Viverra zibetha*) all occur—the Palm Civet (อั้งยี่) being particularly common; and a Jungle Cat (*Felis chaus*) was shot close to camp while devouring a hare, and which it showed no inclination to give up or leave. This is a long legged and short tailed cat—

the tail being less than the cat's height at the shoulder and less than half its body length.

Some years ago Mr. Irwin obtained a fair-sized cat of uniform colour in the jungle north of the railway line east of Ban Pong, and which was probably the Golden or Bay Cat (*Felis temminckii*).

A Palm Civet (*Paradoxurus hermaphroditus*) came to my camp kitchen three times within an hour and a half one night, I lying in a chair within 10 yards. On the first two occasions it was chased away by a dog, and on the third it was shot. The object of its visit was a Chinese Francolin.

The jackal is more frequently heard than seen; personally I have only seen young animals, but a fairly good skin of what appears to be an adult was shot by Mr. Butler in the Pran district.

The red Hunting Dog (*Cyon rutilans*) occurs over the whole district and appears to come down to the open country in the rains, probably following the Sambar. It is curious to note that the Siamese have a similar theory to that held by the natives of India as to the hunting methods of this species and, to quote Blanford, "It is believed that the urine of these animals is excessively acrid, that they "sprinkle with it the bushes through which they drive their prey, "and then rush upon the latter when blinded by the pungent fluid. "Another version is that they jerk the urine into their victim's eyes "with their tails."

The child-like footprint of the Malay bear I have frequently seen on the hills, as also his wood-boring operations in search of honey.

The big Bamboo Rat (*Rh. sumatrensis*), 19 in. long, digs a burrow on the hill sides but probably is not common, as I have seen only two; and the biggest of the rodents—the Porcupine (*Hystrix bengalensis*)—is generally distributed.

Of the Ungulates, a herd of wild elephants were found this year, in August, only one day's march west of Ratburi, and they are generally distributed, moving about according to season. They feed largely on the big leaved bamboo (ไม้พาก) and break down two or three culms together—the bamboos snapping with loud reports. Rhinoceros and Tapir occasionally visit this class of jungle during the rains; but the Sladang (กระทิง) remains in the more open jungle throughout the year, as does the วัวป่า, which I have not yet seen but

but which is probably *Bos sondaicus*

At present, two *Cervidae* only are known from this district, the Barking Deer (*Cervulus muntjac*) and the Sambar (*Cervus unicolor*). It is worthy of note that I have not yet found a young Barking Deer with spots, though Blanford states that the young are spotted. It is more generally distributed than the Sambar in this area and stays on in the drier jungle, which the Sambar forsakes in the hot season; and I also heard it calling one wet gusty night when camped on the watershed in the height of the monsoon at an elevation of 1000 metres. The rutting season is apparently January-February, but is not well defined if the gestatory period of 6 months given by Blanford is correct; for on the 12th February I obtained a young Barking Deer less than 2 weeks old, found in its form at an elevation of 440 metres on a hill side and still rather unsteady on its legs; and also, on the 28th March, my coolie shot a female with well developed foetus, and on the 29th March obtained a female in milk.

It is reasonable to suppose that the young should be born when there is plenty of tender herbage, rather than in the hot months when the female would have to travel considerable distance to and from water in the drier areas; and the fact that some young are dropped in the wet months appears to be recognised by native hunters, for I well remember in Pachin, in the latter part of September, carefully stalking a native hunter who was imitating the bleat of a young Barking Deer.

From this district I have only one skin of a young Sambar about one-third grown, and this has a few indistinct spots on either flank. I also, on the 1st January, in Lat. 14° 10' N., saw the skin of a young Sambar pegged out to dry and this also showed indistinct flank spots, the general colour of the "skin" being a soft smoky fawn with a very dark back line. Thus, presumably, the form of Sambar found here belongs to the Malayan variety, *C. unicolor equinus*.

Blanford is probably correct in stating that Sambar horns of more than 35 in. long are seldom if ever obtained out of India. The heaviest horn of which I have any record measured 30.4 in. The circumference below the brow tine was 8.6 in. and above that tine 7 in. and above the 2nd or bey tine 5 in. This single horn was purchased by an official for 12 ticals, its enhanced value being due to a small swelling which the vendor asserted was still growing; and the belief is

that as the horn grows so do the fortunes of the possessor. Horns in the velvet also command a large price, being used as a strengthening medicine.

The Mouse Deer (probably *Tragulus javanicus*) is generally distributed in the denser jungle bordering on streams and was never obtained on the hill sides.

Of the primitive Scaly Ant-eater (*Manis sp.*) I have seen only one skin, the specimen being obtained on a hill S. W. of Petchaburi.

Of birds, the Paradise Flycatcher (*Terpsiphone affinis*) was obtained in adult breeding plumage in mixed jungle in April; and around the camp the Black-and-red Broadbill (*Cymborhynchus macrorhynchus*) was very common. The dead specimen gives a poor idea of the true colours—the brilliant azure blue of the beak fading one day after death. This species was never observed in the southern area, where the Dusky Broadbill (*C. sumatranus*) was obtained. Both species are usually sluggish and always absurdly tame.

The Blue-winged Pitta (*P. cyanoptera*) was observed around camp from April to July, in the belt of fairly heavy jungle bordering on the stream. The Great Pied Hornbill and smaller Wreathed Hornbill bred in the Wood-oil trees around the camp.

Of the big Ibis (*Thaumatibis gigantea*) I procured one specimen, of which Mr. Healey has made an excellent coloured drawing, and this is probably only the fourth specimen obtained up to the present time. It is a peculiar bird, being differently proportioned to the other species of the family, all of which appear to be tall or upright birds, with the tarsus usually one quarter to one half the length of the wing; whereas this is a "long" bird, and the proportion of tarsus to wing is only one-fifth. Also, the habits are different—this species being seen in small open spaces surrounded by jungle, whereas the rest of the family prefer the large swamps and wider plains. It is rare and very locally distributed. In 1910 I saw one south-west of Petchaburi and this year have seen five altogether. Mr. Irwin also reports having observed the bird south of this area in Muang Pran.

The Purple Wood Pigeon (*A. puniceus*) was not obtained north of Lat. 13°. The Orange-breasted Green Pigeon (*O. bicincta*) was plentiful in the northern area and the Green Imperial Pigeon (*O. aenea*) was generally distributed and frequently fed on some species of Ficus

in camp. One of these was shot and borne off, as it fell, by a Sparrow Hawk. The Hawk could not rise with the weight of the bird, but glided with it to a perch.

In the open forests of *Shorea*, the Chinese Francolin is most common and, during the rains, very noisy. One I shot this year was perched in a tree upwards of 30 feet from the ground.

† Jungle Fowl (*Gallus ferrugineus*) are very common, and the † Silver Pheasant (*Genuacus lineatus*) is generally distributed. I found on April 3rd a nest of this with 8 eggs, the nest being situated some 2 kilometres from water, so far as I know, but it was cavernous limestone country and there may have been some underground pool accessible.

⊥ Peacocks (*Pavo muticus*) were abundant, and a number of eggs were hatched out. Except for the morning and evening call at roost, the Peacock is a very silent bird; but these hand-reared chicks were cheeping and calling throughout the day and never happy if left alone. They became a nuisance in office. It was amusing to watch chicks of 3 weeks old erecting stumpy tails and lowering wings to intimidate a young Macaque, or a ground lizard (Siamese, "Yaa" ^๒ย้า); or when a little older, trying to frighten a Woodpecker which had excited their wrath by tapping on dry bamboo poles.

The "Yaa" (*Liolepis belliana*) are found everywhere in light, warm, dry soils, and in the cleared area of my camp there were a number of them. The big ones seemed to stay below ground during bad weather—stopping up the entrance hole from beneath. They run very fast and have the habit of sitting up to observe anything at a distance. The female, I believe, tends the young when hatched out; as I remember seeing one dug out with a number of quite young lizards in the same burrow.

The brown lizard, common in Bangkok gardens, was found at all elevations and I shot a Monitor (*Varanus nebulosus*, Siamese, ๓๕๓๓ Takuat) at some 900 metres elevation on the boundary, which had in its mouth one of these lizards. They (*V. nebulosus*) were breeding in July, and I found the eggs lightly covered with loose earth.

[To be continued.]

A PRELIMINARY LIST OF THE BIRDS OF BANGKOK.

BY W. J. F. WILLIAMSON.

The following list, comprising 127 species, is the result of observations made, and specimens procured, during several years of desultory study of the bird-life of Bangkok, followed by a year of more systematic collecting since the formation of the Society.

The numbers marked with an asterisk (*) relate to species of which either no specimens have been obtained (although the occurrence of the birds is believed to be tolerably certain) or of which the identification has not yet been definitely established. These birds are eight in number and it is hoped that members will endeavour to assist in clearing up the doubts regarding them by procuring and examining specimens. I shall be very glad to undertake the examination of these or any other birds which may be sent to me, as to the identity of which members may be uncertain.

The numbers in brackets are those of the same birds in Oates' and Blanford's volumes in the *Fauna of British India*, and both the classification and the nomenclature are also taken from that work.

The list is, doubtless, still far from complete, as a number of additions have been made to it even during the last few weeks, almost up to the date of going to press. Any new birds which members may be able to procure will be duly acknowledged and incorporated in the serial paper, which I hope to commence in the next number of the *Journal*, giving some account of the appearance, habits, &c., of the birds of this locality.

I cannot conclude without expressing my obligations to Mr. H. C. Robinson, of Kuala Lumpur, for much helpful advice and for his kindness in determining the species of a number of the more difficult birds. My sincere thanks are also due to Mr. E. G. Herbert for his unfailing encouragement and co-operation in the study of our birds, and for his invaluable aid in the identification of many of the specimens obtained.

ORDER—PASSERES.

FAMILY *Corvidae*—CROWS.

- 1 (4) *Corvus macrorhynchus*. The Jungle Crow.
- 2 (21) *Crypsirhina varians*. The Black Racket-tailed Magpie.

FAMILY *Crateropodidae*—LAUGHING THRUSHES.

BABBLERS, BULBULS, &c.

- 3 (176) *Mixornis rubricapillus*. The Yellow-breasted Babbler.
- 4 (243) *Aegithina tiphia*. The Common Iora.
- 5 (288) *Otocompsa emeria*. The Bengal Red-whiskered Bulbul.
- 6 (298) *Pycnonotus analis*. The Yellow-vented Bulbul.
- 7 (307) *Pycnonotus plumosus*. The Large Olive Bulbul.

FAMILY *Dicruridae*. DRONGOS OR KING-CROWS.

- 8 (327) *Dicrurus ater*. The Black Drongo.
- 9 (332) *Dicrurus leucogenys*. The White-cheeked Drongo.
- 10 (340) *Dissemurus paradisicus*. The Larger Racket-tailed Drongo.

FAMILY *Sylviidae*—WARBLERS.

- 11 (363) *Aerocephalus stentoreus*. The Indian Great Reed-Warbler.
- 12 (364) *Aerocephalus orientalis*. The Eastern Great Reed-Warbler.
- 13 (374) *Orthotomus sutorius*. The Indian Tailor-bird.
- 14 (375) *Orthotomus atrigularis*. The Black-throated Tailor-bird.
- 15 (381) *Cisticola cursitans*. The Rufous Fantail-Warbler.
- 16 (393) *Arundinax ædon*. The Thick-billed Warbler.
- 17 (410) *Phylloscopus fuscatus*. The Dusky Willow-Warbler.
- 18 (417) *Phylloscopus superciliosus*. The Crowned Willow-Warbler.

- 19 (420) *Acanthopneuste borealis*. The Arctic Willow Warbler.
 20 (423) *Acanthopneuste plumbeitarsus*. Middenorff's Willow-Warbler.
 21 (468) *Prinia blanfordi*. The Burmese Wren-Warbler.

FAMILY *Laniidae*—SHRIKES.

- 22 (475) *Lanius nigriceps*. The Black-headed Shrike.
 23 (481) *Lanius cristatus*. The Brown Shrike.
 24 (500) *Pericrotus peregrinus*. The Small Minivet.
 25 (503) *Pericrotus cinereus*. The Ashy Minivet.
 26 (512) *Artamus fuscus*. The Ashy Swallow-Shrike.

FAMILY *Oriolidae*—ORIOLES.

- 27 (514) *Oriolus indicus*. The Black-naped Oriole.
 28 (521) *Oriolus melanocephalus*. The Indian Black-headed Oriole.

FAMILY *Sturnidae*—STARLINGS AND MYNAS.

- 29 (536) *Sturnia sinensis*. The Chinese Myna.
 30 (546) *Graculipica nigricollis*. The Black-necked Myna.
 31 (553) *Aethiopsar grandis*. The Siamese Myna.
 32 (556) *Sturnopastor superciliaris*. The Burmese Pied Myna.

FAMILY *Muscicapidae*—FLYCATCHERS.

- 33 (562) *Siphia albicilla*. The Eastern Red-breasted Flycatcher.
 34 (579) *Stoparola melanops*. The Verditer Flycatcher.
 35 (588) *Alseonax latirostris*. The Brown Flycatcher.
 *36 (599) *Tersiphone affinis*. The Burmese Paradise Flycatcher.
 37 (601) *Hypothymis azurea*. The Indian Black-naped Flycatcher.
 38 (606) *Rhipidura javanica*. The Java Fantail Flycatcher.

FAMILY *Turdidae*—THRUSHES.

- 39 (610) *Pratincola maura*. The Indian Bush-Chat.
 40 (611) *Pratincola leucura*. The White-tailed Bush-Chat.
 41 (650) *Calliope camtschatkensis*. The Common Ruby-throat.
 42 (663) *Copsychus saularis*. The Magpie-Robin.
 43 (692) *Petrophila solitaria*. The Eastern Blue Rock-Thrush.
 44 (693) *Petrophila cyanus*. The Western Blue Rock-Thrush.

FAMILY *Ploceidae*—WEAVER BIRDS.

- 45 (721) *Ploceus megarhynchus*. The Eastern Baya.
 46 (723) *Ploceus manyar*. The Striated Weaver-bird.
 47 (727) *Uroloncha acuticauda*. Hodgson's Munia.
 48 (735) *Uroloncha punctulata*. The Spotted Munia.

FAMILY *Fringillidae*—FINCHES

- 49 (779) *Passer montanus*. The Tree-Sparrow.
 50 (781) *Passer flaveolus*. The Pegu House-Sparrow.

FAMILY *Hirundinidae*—SWALLOWS.

- 51 (814) *Hirundo gutturalis*. The Eastern Swallow.

FAMILY *Motacillidae*—WAGTAILS.

- 52 (826) *Motacilla alba*. The White Wagtail.
 53 (833) *Motacilla borealis*. The Grey-headed Wagtail.
 54 (839) *Limonidromus indicus*. The Forest-Wagtail.
 55 (845) *Anthus richardi*. Richard's Pipit.
 56 (847) *Anthus rufulus*. The Indian Pipit.

FAMILY *Alaudidae*—LARKS.

- 57 (869) *Mirafra cantillans*. The Singing Bush-Lark.

FAMILY *Nectariniidae*—SUN-BIRDS.

- 58 (898) *Arachnechthra flammaxillaris*. The Burmese Yellow-breasted Sun-bird.

59 (903) *Anthothreptes malaccensis*. The Brown-throated Sun-bird,

60 (911) *Chalcoparia phoenicotis*. The Ruby-Cheek.

FAMILY *Dicaeidae*—FLOWER PECKERS.

61 (912) *Dicaeum cruentatum*. The Scarlet-backed Flower-pecker.

ORDER PICI.

FAMILY *Picidae*—WOODPECKERS.

62 (950) *Gecinus occipitalis*. The Black-naped Green Woodpecker.

63 (970) *Dendrocopus pectoralis*. The Spotted-breasted Pied Woodpecker.

ORDER—ZYGODACTYLLI.

FAMILY *Capitonidae*—BARBETS.

64 (1019) *Xantholaema haematocephala*. The Crimson-breasted Barbet.

ORDER—ANISODACTYLLI.

FAMILY *Coraciidae*—ROLLERS.

65 (1023) *Coracias affinis*. The Burmese Roller.

FAMILY *Meropidae*—BEE-EATERS.

66 (1027) *Merops philippinus*. The Blue-tailed Bee-eater.

FAMILY *Alcedinidae*—KINGFISHERS.

67 (1033) *Ceryle varia*. The Indian Pied Kingfisher.

68 (1035) *Alcedo ispida*. The Common Kingfisher.

69 (1043) *Pelargopsis gural*. The Brown-headed Stork-billed Kingfisher.

70 (1044) *Halcyon smyrnensis*. The White-breasted Kingfisher.

71 (1045) *Halcyon pileata*. The Black-capped Kingfisher.

72 (1047) *Sauropatis chloris*. The White-collared Kingfisher.

ORDER—MACROCHIRES.

FAMILY *Cypselidae*—SWIFTS.

- 73 (1071) *Cypselus pacificus*. The Large White-rumped Swift.
 74 (1081) *Collocalia fuciphaga*. The Indian Edible-nest Swiftlet.

FAMILY *Caprimulgidae*—NIGHTJARS.

- 75 (1091) *Caprimulgus asiaticus*. The Common Indian Nightjar.
 *76 (1093) *Caprimulgus macrurus*. Horsfield's Nightjar.

ORDER—COCCYGES.

FAMILY *Cuculidae*—CUCKOOS.

- 77 (1108) *Hierococcyx sparveroides*. The Large Hawk-Cuckoo.
 78 (1113) *Cacomantis merulinus*. The Rufous-bellied Cuckoo.
 79 (1114) *Penthoceryx sonnerati*. The Banded Bay Cuckoo.
 80 (1116) *Chrysococcyx maculatus*. The Emerald Cuckoo.
 81 (1119) *Coccytes coromandus*. The Red-winged Crested Cuckoo.
 82 (1120) *Eudynamis honorata*. The Indian Koel.
 83 (1130) *Centropus sinensis*. The Common Coucal or Crow-Pheasant.
 84 (1133) *Centropus bengalensis*. The Lesser Coucal.

ORDER—PSITTACI.

FAMILY *Psittacidae*—PARROTS.

- 85 (1138) *Palaeornis torquatus*. The Rose-ringed Paroquet.

ORDER—STRIGES.

FAMILY *Strigidae*—OWLS.

- 86 (1152) *Strix flammea*. The Screech Owl.

FAMILY *Asionidae*—OWLS.

- 87 (1173) *Scops git*. The Scops Owl.
 88 (1178) *Scops bakkamoena*. The Collared Scops Owl.

- 89 (1187) *Ninox scutulata*. The Brown Hawk-Owl.

ORDER—ACCIPTRES.

FAMILY *Vulturidae*—VULTURES.

- *90 (1191) *Otogyps calvus*. The Black Vulture.
 *91 (1196) *Pseudogyys bengalensis*. The Indian White-backed Vulture.

FAMILY *Falconidae*—EAGLES, KITES, FALCONS, ETC..

- 92 (1228) *Haliastur indus*. The Brahminy Kite.
 93 (1229) *Milvus govinda*. The Common Pariah Kite.
 94 (1230) *Milvus melanotis*. The Large Indian Kite.
 95 (1232) *Elanus caeruleus*. The Black-winged Kite.
 96 (1236) *Circus melanoleucus*. The Pied Harrier.
 97 (1237) *Circus aeruginosus*. The Marsh-Harrier.
 98 (1244) *Astur badius*. The Shikra.

ORDER—COLUMBAE.

FAMILY *Columbidae*—PIGEONS AND DOVES.

- 99 (1279) *Osmotreron vernans*. The Pink-necked Green Pigeon.
 *100 (1308) *Turtur tigrinus*. The Malay Spotted Dove.
 101 (1311) *Oenopopelia tranquebarica*. The Red Turtle-Dove.
 102 (1315) *Geopelia striata*. The Barred Ground-Dove.

ORDER—GALLINAE.

FAMILY *Phasianidae*—PHEASANTS.

- *103 (1354) *Excalfactoria chinensis*. The Blue-breasted Quail.
 *104 (1374) *Francolinus chinensis*. The Eastern or Chinese Francolin.

ORDER—GRALLAE.

FAMILY *Rallidae*—RAILS.

- 105 (1389) *Hypotaenidia striata*. The Blue-breasted Banded Rail.
 106 (1398) *Amaurornis fuscus*. The Ruddy Crane.

107 (1401) *Amaurornis phoenicurus*. The White-breasted Water-hen.

108 (1403) *Gallierex cinerea*. The Water-Cock.

ORDER—LIMICOLAE.

FAMILY *Glareolidae*—COURSERS AND PRATINCOLES.

109 (1425) *Glareola orientalis*. The large Indian Pratincole or Swallow-Plover.

FAMILY *Charadriidae*—PLOVERS, SANDPIPERS AND SNIPES.

110 (1432) *Sacrogrammus atrinuchalis*. The Burmese Wattle Lapwing.

111 (1439) *Charadrius fulvus*. The Eastern Golden Plover.

112 (1447) *Aegialitis dubia*. The Little Ringed Plover.

113 (1460) *Totanus hypoleucus*. The Common Sandpiper.

114 (1461) *Totanus glareola*. The Wood Sandpiper.

115 (1462) *Totanus ochropus*. The Green Sandpiper.

116 (1484) *Gallinago coelestis*. The Fantail Snipe.

117 (1485) *Gallinago stenura*. The Pintail Snipe.

118 (1488) *Rostratula capensis*. The Painted Snipe.

ORDER—GAVIAE.

FAMILY *Laridae*—GULLS AND TERNS.

119 (1496) *Hydrochelidon hybrida*. The Whiskered Tern.

ORDER—HERODIONES.

FAMILY *Ardeidae*—HERONS.

120 (1562) *Bubulcus coromandus*. The Cattle Egret.

121 (1565) *Ardeola grayi*. The Pond Heron.

122 (1568) *Nycticorax griseus*. The Night Heron.

123 (1571) *Ardetta sinensis*. The Yellow Bittern.

124 (1572) *Ardetta cinnamomea*. The Chestnut Bittern.

125 (1573) *Dupetor flavicollis*. The Black Bittern.

ORDER—ANSERES.

FAMILY *Anatidae*—SWANS, GEESE AND DUCKS.

126 (1589) *Dendrocyena javanica*. The Whistling Teal.

*127 (1601) *Querquedula cirica*. The Garganey or Blue-winged Teal.

A NEW SPECIES OF BAT FROM SIAM.

(*Hipposideros lylei*)

BY OLDFIELD THOMAS.

Hipposideros lylei, sp. n.

A large species related to *H. pratti*, Thos.

Size rather less than in *H. pratti*. General characters of the *H. armiger* group; including the long feet, development of a posterior transverse crest behind the normal nose-leaf, and the uninflated forehead of the skull. Nose-leaf similar on the whole to that of *H. pratti*, but the supplementary transverse posterior crest higher, attaining 5 mm. at its highest point on each side of its median cleft, and less heavily haired, but the increase in height may perhaps be due to sex; normal transverse crest similarly high in the centre, sloping down laterally, its front surface divided by a prominent median and two indistinct lateral ridges; anterior horseshoe much more deeply notched in front, the median notch nearly 2 mm. in depth, the horseshoe on each side of it forming two forwardly projecting lappets, outside which again there are two shallower notches, unknown elsewhere in the genus. Ears rather narrower than in *pratti*. Tibiæ and feet very long and slender.

General colour dull buffy or clay-colour, washed with brown.

Skull similar in its general characters to that of *H. pratti* as opposed to those of *H. diadema* and *armiger*; but it is smaller throughout, the sagittal crest (though of a male as compared with a female) less developed and less abruptly rising above the forehead; area of forehead smaller and not quite so flat, the median part above the anterior nares slightly elevated, while its postero-lateral portion is somewhat concave internal to the well marked supraorbital edges. Posterior palate more deeply excavated mesially. Teeth similar in general characters, but smaller throughout.

Dimensions of the type:—

Forearm 78 mm.

Ear 27×21 ; third finger, metacarpal 54, first phalanx 25 ; lower leg and hind foot (c. u.) 51.

Skull : greatest length to front of canine 29 ; basi-sinual length 18·7 ; zygomatic breadth 16 ; interorbital breadth 9·6 ; mastoid breadth 14 ; front of canine to back of m^3 11·2 ; three upper molars together 6·4 ; three lower molars 10·6.

Hab. N. Siam. Type from the Chiengdao Cave, 50 miles north of Chiengmai. Alt. 350 m.

Type. Adult male (skin in spirit). B.M. no. 13. 4. 18. 3. Collected January 1913. Presented by Th. H. Lyle, Esq., H.B.M. Consul at Chiengmai.

The Sze-chwan *Hipposideros pratti* being as yet only known from the type specimen, a female, and the present example being a male, it at first sight seemed possible that we had here the unknown male of that species. But further examination shows such differences as to render this impossible, notably the smaller general size, the much maller teeth (this in a male as compared with a female), and the development of the pendant lappets at the front edge of the horseshoe, not at all likely to be a sexual character.

The type-specimen was obtained in a cave in company with examples of *H. armiger*, as also happened curiously enough with the type of *H. pratti*.

This adds another to the many new Siamese mammals discovered by Mr. Lyle, and I have had great pleasure in connecting his name with it.

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MISCELLANEOUS NOTES.

No. I.—MIGRATION OF RATS.

The migration of rats from one part of the country to another is not unknown, and I was fortunate enough, quite recently, to witness another instance of this interesting habit of theirs. It was all the more extraordinary as it led them to their own destruction. The occurrence took place in September last, when I was stationed at Koh Lak, and lasted for nearly a week. My section-house lies close to the beach, and the first intimation I received of anything unusual, was in discovering one evening that my abode seemed to be full of rats. They swarmed everywhere, running along the beams and rafters, and over and under the floors. I could see also, from my verandah, many more upon the beach, running across the sands and making straight for the sea. Their one idea appeared to be to leave the land. None turned back except when attacked by hawks or crows, of which they had attracted a good number. The following day, when going out to meet the steamer in Koh Lak bay, I noticed several rats well away from the shore, still swimming straight out to sea, and for days afterwards I found their dead bodies on the beach, washed up by the tides. This I observed throughout the whole length of my section, a distance of 30 kilometres.

I am unable to give any explanation to account for this migration. The only thing which I noticed at the time was an unusually large number of jungle fowl about. This I look upon as a coincidence, as I cannot see in any way what relation the one creature could bear to the other.

I did not, unfortunately, keep any specimen so that the animals could be positively identified, but they appeared to me to be the ordinary house rat which is common everywhere.

T. S. BUTLER.

December, 1913.

No. II.—SORE NECK IN SAMBAR.

From 1910 to 1913 I was engaged on Survey work in the district lying approximately between Lat. $14^{\circ}.00'$ and $16^{\circ}.00'$ N. and Long. $98^{\circ}.30'$ and $100^{\circ}.00'$ E. Most of this area is in the valleys of the Me Klawng river or its tributaries, the remainder being on the edge of the watershed of the Menam Chao Praya. During those years, between the months of December and June, I shot several Sambar in this district, all of which were affected by a peculiar sore upon the

neck situated in the mid-line in front and about half way down. The actual sore was round, about an inch and a half in diameter, and the skin around it devoid of hair, which had apparently been rubbed off over an area about 8 inches long and 6 inches wide in adult animals, the sore being in the middle of this bare patch. The sore seemed to be merely a superficial affection of the skin, and did not extend deeply, or indeed penetrate the skin or affect the flesh at all, but it seemed to be accompanied by considerable itching. The hair round the sore appeared to be worn off by rubbing to allay the irritation. Animals of all ages and both sexes suffered from this sore.

Mr. A. J. Irwin, of the Survey Department, has also observed the same affection in Sambar shot by him in the present year, and has given me the following information.

The disease is called "Khi ruen kwang" or "the leprosy of the Sambar" by the Siamese, and the "Ma-kawk season sore" by the Kariangs. A Siamese hunter who has lived for years on the edge of the jungle, and has killed many Sambar, considered it a disease to which Sambar were subject permanently, being born with it, and he was much surprised to hear that they did not suffer from it everywhere. An old Kariang informed him that the Sambar suffered from it only during the "Ma-kawk" season, when even the young in the womb bore the mark, and not during the rest of the year. The Ma-kawk tree is a kind of wild plum tree, bearing fruit having a sourish sweet taste. It is generally called in English the "Wild Olive," but the fruit is about three times the size of a large olive, and the taste is different. The fruit ripens, according to the class of jungle and country, at different times through the dry season. Deer are very fond of this fruit. The Kariang gave Mr. Irwin the following legendary account of the origin of the sore. Phra Sian (Buddha) gave the Sambar the fruit of the Ma-kawk tree to eat. The Sambar tasted it, and then refused it, saying it was sour. Phra Sian said, "Very well, then the Ma-kawk fruit shall not be considered food for the Sambar." Afterwards the Sambar again tasted the fruit, and finding it sweet on this occasion, came to Phra Sian and begged permission to eat it in future. Phra Sian granted permission, but as a punishment for fickleness condemned all Sambar to suffer from the sore on the neck during the Ma-kawk season.

I have shot Sambar further south than the district referred to, in the Ma-kawk season, and so has Mr. Irwin, and neither of us has noticed any sore on the animals there. It does not seem to affect the Sambar in the Pitsanulok jungles, or in the Siamese portion of the Malay Peninsula, where I have also shot Sambar, and where the Ma-kawk fruit is eaten by them. Where they suffer from the disease, the animals may be only affected during the Ma-kawk season, but I do not think that eating that fruit causes the sore. The district in which I have noticed them suffering from it, is one abounding in mineral springs, called "Pong Nam" in Siamese. Animals frequent these to drink the water. This water may possibly cause the sore in Sambar, but not in other animals. It will be inter-

esting to learn if any readers of this Journal have noticed the occurrence of the sore, in any other locality and can give information as to its cause.

P. R. KEMP.

January, 1914.

[This curious sore upon the necks of Sambar is not unknown. Major Evans in his book, *Big Game Shooting in Upper Burma* (1910) speaks of it, and states positively that it occurs in all Sambar and at all times (presumably in Burma and India). He considers it to be of parasitic origin. It does not appear to be found upon animals in captivity.—Eds.]

No. III.—A CASE OF TRIPLETS IN AN ELEPHANT.

The case of an elephant giving birth to triplets, has, I believe, never yet been known, so I think the following instance should be recorded.

There is no note of the date of impregnation. The elephant was first reported in calf in October 1912, when she would be evidently well on in pregnancy, and on October 27th of the following year gave birth to three male calves, of which one was still-born and the other two only survived until November 8th and 9th, respectively. Everything was done to bring them up, but the mother would not look after them and kicked them off whenever they came to suckle. If let loose she would run away from them.

Of the calves born alive, one was normal and one very small. Me Heean, the mother, is 7ft 4 ins. in height and is a young elephant probably about 25 years old. She has never to my knowledge calved before.

Triplets are entirely unknown in the writer's experience and Lt. Col. Evans, the Indian Government expert, quotes no instance of even twins in his standard work *Elephants and their Diseases*. I believe, however, the Bombay Burma Trading Corporation had a case of twins in Muang Prae district a year or two ago.

D. F. MACFIE.

CHIENGMAI, December 18th, 1913.

No. IV. DISTRIBUTION OF CERTAIN ANIMALS IN SIAM.

I should like to ask through your columns for information on the following points, some of which I feel sure must be known to members of the Society up-country.

1. What is the eastern range of the Gaur or Sladang, (*Bos gaurus*) the Gayal (*B. frontalis*) and the Banting (*B. sondaicus*)?

To which of the two last does the Siamese name จิ้งป้า refer, as there seems to be some doubt on the matter.

2. Blanford, in the *Fauna of British India*, states that the young of Sambar are never spotted at any time of their existence,

whereas the young of Barking Deer are spotted. My own experience reverses this entirely, and I believe, in the Malay Sambar, it is now recognised that the young are spotted, though at what age they lose their spots is uncertain.

3. Has the Brow-Antlered Deer a spotted coat at certain seasons? Have any heads been obtained with a greater antler measurement than 54 inches, the biggest given by Blanford? As regards Sambar heads, the skull of the Siamese form is as big as, or perhaps bigger than, the Indian, but the horns of the Siamese are much shorter, though the circumference at the butt or above the first tine is frequently as great as the Indian.

4. Messrs Yates and Rogers, of the Bombay Burma Trading Corporation, have reported a black species of Wild Dog. Has anyone else ever met with this animal, and have specimens ever been obtained? Where do the (red) Wild Dog (*Cyon rutilans*) go in the dry season? I have observed that they chase the Sambar down to the cultivation at the beginning of the rains in May and June; at other seasons I never see them.

5. Nothing is generally known as to whether the two species of Rhinoceros occur east of the Menam Chow Phraya, and the northern limit of the Tapir (*Tapirus indicus*, Siamese "Samset") is uncertain.

K. G. GAIRDNER.

February, 1914.

NO. V.—BREEDING OF THE PAINTED SNIPE.

It is not surprising to find that the Painted Snipe (*Rostratula capensis*) or "Painter" breeds within the limits of the ordinary Bangkok shooting grounds, as it has been recorded from Calcutta and also from Burma, but as far as I am aware it has not been recorded from Siam, and more particularly from Bangkok. During the last rains I have had two clutches of eggs and two young birds brought to me. The first clutch of four eggs was found on the 6th July, and had been laid about a week. The second nest, also of four eggs, was found on the 11th August, and these eggs had been laid fully ten days. The first young bird was caught by Mr. McBeth and sent to me on the 18th September; it was nearly fully fledged and could rise about two feet from the ground but could not fly. The other young bird was caught about ten miles below Paknampho on the 3rd October, and was fully fledged.

It was interesting to note, in these young birds, the curious display by which this species seeks to terrorize an enemy, and which has been described by Finn in *How to know the Indian Waders*. When

slightly alarmed the bird would raise the wing farthest from the intruder, but when "cornered", both wings would be extended and brought forward until they reached beyond the tip of the beak, and the tail spread, so that the beautiful spotted markings were fully shown. The hissing, as described by Finn, was very noticeable in the older bird, but in the younger one it was replaced by a low plaintive whistle, so it possibly only occurs with the more fully developed birds.

The "Painter" is reported as breeding two or three times during the season, and it is likely that the breeding season in Bangkok extends over the greater part of the rains. The nest is the usual hollow, often with a pad of grass, and the eggs are four in number, slightly pyriform in shape, yellowish stone colour with large markings of very dark brown or black. The eggs measure 1.4 by 1 inches. Should anyone be so fortunate as to come across a sitting bird, it would be interesting to note whether it is a male or female, as the male is the inferior bird and there is reason to believe that it sits on the nest.

E. G. HERBERT.

October, 1913.

+ No. VI. BREEDING OF PAINTED SNIPE IN SIAM.

The point as to whether the Painted Snipe breeds around Bangkok has been discussed and doubted so often that it will interest sportsmen and naturalists, I feel sure, to know that while shooting this season at Sala Yah, I came across a mother with four chicks. This was on September 22nd. My man caught one of the chicks. It was quite small and unable to fly, being covered only with down, and had therefore obviously been hatched out only a few days. I did not keep the chick or make any special note of its coloration, but the parent bird, which I saw at quite close quarters, was clearly a "Painter."

C. H. FORTY.

November, 1913.

+ No. VII.—THE MOULTING OF SNIPE.

I noticed this season that the "Pintails," or, at any rate, the early arrivals, were already in moult when they reached Bangkok. In the case of four of the first birds shot (Sept. 14th), one had completed the moult of the primaries but the new feathers were not quite fully developed; the second had only the two outer primaries of the old feathers remaining and the new ones were in varying states of development; the third had lost six of the old primaries, and the fourth bird had only lost four. In the latter two instances the new

feathers were little more than stumps. It is true this was an exceptionally late season in starting, and may have had something to do with the particular stage of moult in which the birds arrived, but that rather adds to the interest of the subject than otherwise.

The moult of the primaries appeared to start from about the centre of the wing, usually about the 7th and 8th, followed by the next outer pair and then an inner pair, so by the time the outer pair of primaries were dropped the new centre feathers had put on a fair amount of growth. This was about the weakest stage of the moult, when only the outer pair of old primaries remain.

Another noticeable feature of the moult was the dropping of the "pin" feathers from the tail, which occurred about a month later.

E. G. HERBERT.

November, 1913.

- No. VIII.—DISTRIBUTION OF THE INDIAN PIED KINGFISHER
(*CERYLE VARIA*) AND SPOTTED OWLET
(*ATHENE BRAMA*) IN SIAM.

I have been endeavouring to trace recently the southern limit of the Indian Pied Kingfisher (*Ceryle varia*. F. 1033) and should be glad if your readers would help me. This bird abounds on the Me Ping and Me Yome, and rivers further North, and is very plentiful on the Menam above and below Bangkok, but is unknown in the Malay States. It is common in India, Ceylon, and Burma in the plains, except south of Amherst, and it extends east into China, but apparently does not go much south of Bangkok. It should not be difficult to trace, as it is a noisy bird and can be readily recognised by its peculiar fishing habits. Unlike other Kingfishers it never plunges from a fixed perch, but flies over the water and hovers with its beak pointed downwards, at a height of frequently 15 or 20 feet above the surface, when it suspects the presence of a fish. It dives for its prey after hovering, hence the Siamese name "Nok kra ten pak lak," which likens the long straight plunge to the driving of a stake.

+ Another species which occurs in Siam, though as far as I am aware it has not previously been recorded, is the Spotted Owlet (*Athene brama*. F. 1180). It is quite common some 40 miles north of Bangkok, but I believe it does not occur in Bangkok or further south in Siam—the exact distribution of it is therefore of interest.

Blanford gives it as occurring throughout India, but not in Ceylon, and as common in the Irrawaddy valley from Prome upwards, the latitude of Prome being about 18°. The latitude at which it is found in Siam is known to be as far south as 14°.

The Spotted Owlet is a noisy little bird (8" long) which comes out before sunset and pours forth a volley of chuckles and squeaks. Usually two of these individuals sit shouting together, as if trying which can finish its chatter first. The entire upper plumage is an ashy brown copiously spotted with white, and the tail is barred with

four to six bars. The lower plumage is whitish with broken brown cross bars or spots. The legs are feathered down to the feet, and the toes covered with long bristles on the upper side. This owl has no so called "ears", and must not be confused with the Scops Owl, which is a quiet little owl and only utters a monotonous "toop" at regular intervals of about ten seconds.

E. G. HERBERT.

January, 1914.

No. IX. DISTRIBUTION OF *ANCISTRODON RHODOSTROMA*,
THE MALAYAN VIPER, IN SIAM.

The only record of this snake in Siam up to the present has been from the island of Puket. North of this latitude it had not been known at all. Recent collections have shown, however, that it has a much wider distribution. It is not uncommon at Bangtaphan, near the sea coast, and Mr. P. A. R. Barron has found it at Nong Kai Ploi, just E. of Srimaharicha, elevation 150 metres, where it appears to be equally plentiful. One was recently caught at Lopburi, and Dr. Sprater procured last year a very young specimen at Kumpawapi, 250 km. N. of Korat, Lat. 17° 10' N., Long. 102° 50' E. It will thus be seen to have a wide distribution in this country, and its northern range of habitat greatly increased.

Speaking of its poison, Boulenger says, "This snake was long known from Java only, where it is regarded as one of the most dangerous poisonous snakes, cases being known of men dying five minutes after being bitten. In the neighbourhood of Biserat and Kuala Jalar (Malay States) where it was discovered by Messrs Annandale and Robinson, the natives do not believe its bite to be fatal." The people of Bangtaphan and Nong Kai Ploi, who appear to know this snake quite well, also agree that its bite is not particularly dangerous, and as natives on the subject of snake-bite are apt to exaggerate rather than otherwise, one is inclined to accept these statements as correct.

I have recently acquired 4 living specimens. They are extremely sluggish creatures, remaining motionless throughout the entire day, usually coiled up in a circle with the head projecting from the middle, and the body comfortably bedded down into the sand of their cage. Even a stick will hardly rouse them, and when taken up they move off in a leisurely fashion. At night they become more active and wander about. I have never yet heard them hiss, but when thoroughly excited will "rattle" the tip of the tail at great speed. They feed freely upon mice, frogs and toads.

Details of 7 specimens as follows:—

	Locality.	Total length in mm.	Tail.	COSTALS			Ventrals.	Subcaudals.	Upper labials.
				2 heads-lengths behind head.	Mid-body.	2 heads-lengths before vent.			
1.	Bangtaphan	315	30	23.	21.	17.	160	38	7 and 7
2.	„	420	45	23.	21.	17.	160	37	7 and 8
3.	„	175	20	23.	21.	17.	159	37	8 and 8
4.	„	390	—	21.	21.	17.	150	48	7 and 8
5.	Nong Kai Ploi	790	90	22.	21.	17.	154	40	7 and 8
6.	„	248	28	21.	21.	19.	160	35	7 and 7
7.	Kumpawapi	240	25	21.	21.	17.	160	37	7 and 8

Their markings show but little variation. Above, they are light or dark brown in color, with a faint pinkish tinge, and mottled and clouded in varying degrees with darker. The vertebral line, and the large triangular spots on either side of it, so characteristic of this snake are, in the majority, jet black (instead of dark brown) and have, when the snake has just cast its skin, a handsome, velvet-like appearance.

At Bangtaphan this snake is known as “ngu maaw sao,” and at Nong Kai Ploi as “ngu kǎbǎ.” The former title may, however, be given to any snake with large prominent spots upon the body.

MALCOLM SMITH.

January 31, 1914.

No X.—LARGE BANDED KRAIT.

An unusually large specimen of the Banded Krait (*Bungarus fasciatus*) was recently killed in the compound of the Bangkok Nursing Home. It was trodden upon by the house coolie when going out to fetch water after dark, and was promptly dispatched by the remainder of the staff, who came to his assistance. The enlarged tip of the tail was unfortunately missing, but allowing 20 mm. for this, it measured, without stretching, 2,020 mm. (6 ft. 7½ in.) in total length, the tail

being 150 mm. Ventrals 212, sub-costals (allowing 6 for the missing portion) 35.

The only instance I can find of a Banded Krait larger than the above was recorded in the *Journal of the Bombay Natural History Society*, 31st October, 1911. It was killed at Koderma, E. I. Ry., by Mr. Hayes, a Mine Manager, and measured 7 ft. in length.

MALCOLM SMITH.

September, 1913.

No. XI.—NOTE ON AN INLAND SEA CAVE IN MUANG PRAN.

In a country where such excessive upheavals of the earth's crust took place in early geological times, and where we have now comparatively recent deposits lying close to the very oldest igneous rocks, it is not surprising that some evidences have been discovered of present day land movement.

I have for some time held the opinion that the whole of this Peninsula is gradually tilting from East to West, and the following note gives, I think, further strength to my theory.

At Muang Pran, where I was surveying last season, there is a hill known as Sam Roi Yot (300 Points). It is an isolated mass of limestone, rising vertically from the plain, at a distance of two miles from the coast. Seen from a distance, it has all the appearance of an island, the surrounding plain lying very low. On the seaward side there are springs of fresh water, and the land is taken up with gardens. On the land side is a large swamp, which dries up in the hot season, leaving a winding stream of brackish water. The soil is salt and only suitable for growing coconuts and long grass. At the southern end of the mass, on the landward side, I found a cave and the general overhanging appearance of sea erosion on the rock. The cave is at present well above the high water sea level, but was reached by the fresh water flood of 1912. Viewed from the top of the hill, the ground shows the distinct form of an old sea beach which is not now reached by the high water spring tides.

On the whole I conclude that Sam Roi Yot was at some not very distant date surrounded by the sea, and what I observed tends to show that the hill has risen. My conclusion is further strengthened by the general silting up which is found upon the shore of this coast, whilst the opposite coast in Trang does not show the same effect, but appears rather to be sinking—thus showing a tilt of the Peninsula towards the West.

S. W. MASTERMAN.

November, 30, 1913.

[Since we naturally expect to find stream-erosion caves in limestone, it should be carefully ascertained whether there are any traces of an old cave stream. It would be interesting also to learn if any other evidence is forthcoming to support Mr. Masterman's theory of this land movement.—Eds.]

PROCEEDINGS OF GENERAL MEETINGS.

INAUGURAL MEETING.

The Society was founded at a meeting held at Mr. W. J. F. Williamson's house on the 4th February 1913, attended by Messrs. S. H. Cole, E. J. Godfrey, C. L. Groundwater, E. A. Laydeker, J. J. McBeth, J. G. Raggi, Dr. A. C. Rankin, Mr. H. Rieschick, Dr. M. Smith, Capt. W. Sprater, and Messrs. E. W. Trotter, W. G. Weeks, and W. J. F. Williamson.

At that meeting resolutions were passed defining the objects of the Society and providing for the drawing up of rules, and a sub-committee, consisting of Messrs. Williamson, Raggi and Cole, was appointed for the latter purpose.

The next meeting was held at Mr. Trotter's house on the 4th March 1913, when the provisional rules drafted by the sub-committee were submitted and approved. The following office bearers for the year 1913 were then elected, viz., President, Mr. W. J. F. Williamson; Hon. Secretary and Treasurer *pro tem.*, Mr. J. G. Raggi; and a committee including Capt. W. Sprater, Dr. M. Smith and Mr. W. G. Weeks.

The duties of Hon. Secretary and Treasurer were handed over to Mr. W. G. Weeks shortly after this meeting.

1ST ORDINARY GENERAL MEETING.

This was held at Mr. J. G. Raggi's house on the 19th March 1913, when Mr. E. J. Godfrey exhibited his collection of Siamese butterflies and gave some explanatory remarks thereon.

2ND ORDINARY GENERAL MEETING.

This meeting took place at Dr. M. Smith's house on 25th June 1913, when Dr. Smith read a paper on "Some common species of snakes found in Bangkok." About 15 kinds were dealt with and a number of specimens shown, both alive and in spirits. Dr. Smith also exhibited the skin of a Serow or Goat-Antelope shot at Koh Lak by Mr. T. S. Butler, and four skulls of animals of the same genus were shown by Dr. Smith and Mr. A. H. Duke. Mr. J. J. McBeth exhibited the skin of a Fire-backed Pheasant obtained at Pak Chong.

SPECIAL GENERAL MEETING.

A special meeting was held on the 22nd July 1913 at Mr. E. A. Laydeker's house to witness a demonstration of bird skinning by Mr. Laydeker.

3rd ORDINARY GENERAL MEETING.

This took place at Mr. W. J. F. Williamson's house on the 17th September 1913, when there were present 22 members and 2 guests, to hear a paper read by Mr. Williamson on "The Common Birds of Bangkok." Specimens of 55 species of the commoner birds were

exhibited during the course of the paper. Mr. E. A. Laydeker exhibited the skins of some bats, and Dr. Smith some specimens of a rare frog (*Glyphoglossus molossus*) and a rare skink (*Lygosoma isodactylum*).

Subsequent to this meeting, the duties of Hon. Secretary and Treasurer were handed over by Mr. Weeks to Mr. K. G. Gairdner.

4th ORDINARY GENERAL MEETING.

This meeting was held at the Oriental Hotel on the 4th December 1913, when 24 members and 1 guest were present. The first business was the consideration of a revised and amplified draft of the rules of the Society, submitted by the Committee. These were passed after some discussion and amendment—the most important alteration being the raising of the subscription from Tcs. 5 to Tcs. 25 per annum in order to meet the cost of publishing a Journal by the Society. Mr. W. J. F. Williamson and Dr. M. Smith were appointed Editors of the Journal.

Mr. K. G. Gairdner then read a paper entitled “Notes on the Fauna and Flora of the Ratburi and Petchaburi Districts”. A coloured chart of the districts was shown and also a coloured drawing made by Mr. E. Healey of a rare Ibis, of which a specimen had been obtained by Mr. Gairdner. At the conclusion of the paper Dr. M. Smith exhibited some species of snakes not previously recorded from Siam. Mr. J. J. McBeth showed the skin of a Marbled Cat.

Mr. S. H. Cole attended this meeting in the capacity of Hon. Secretary and Treasurer of the Society, having taken over the duties of that office from Mr. Gairdner who was shortly proceeding on duty up-country.

STATEMENT OF ACCOUNT FOR THE YEAR 1913.

INCOME.		EXPENDITURE.	
	Tes.		Tes.
Subscriptions for 1913 ...	275.00	Postage	16.66
Subscriptions for 1914 paid in advance ...	15.00	Stationery and account books	16.79
		Printing	43.00
		Total ... Tes. ...	76.45
		Balance in hand on 31st Dec, 1913 Tes. ...	213.55
Total Tes. ...	290.00	Total ... Tes. ...	290.00

Bangkok,
21st February, 1914

(Sd) S. H. COLE,
Hon. Secretary and Treasurer.

LIST OF MEMBERS.

-
- Bailey, J.
 Barron, P. A. R.
 Barton, C. S.
 Bonnafous, H.
 Brewitt-Taylor, L.
 Butler, T. S.

 Cambiaso, Marquis F.
 Carthew, Dr. M.
 Cole, S. H.
 Couper-Johnston, D.
 Craig, R. D.

 Dietrich, G.
 Due-Petersen, Dr.
 Duke, A. H.

 Eisenhofer, E.
 Elwes, G. F. W.

 Forty, C. H.

 Gairdner, K. G.
 Gilmore, W. M.
 Godfrey, E. J.
 Groundwater, C. L.
 Groves, Mrs. S. P.

 Harrop, F. S.
 Healey, E.
 Hepburn, Dr. H. H.
 Herbert, E. G.

 Irwin, A. J.

 Kemp, P. R.

 Lambert, S. G.
 Laydeker, E. A.
 Lucius, Dr. R.
 Lupsa, F.
 Lyons, J. R. C.

 Manaud, Dr. A.
 Mannsfeldt, M.
 Massey, H. E.
 McBeth, J. J.
 Mohr, A.

 Nesbitt, P.
 Nunn, W.

 Ornstein, Dr. med. O.

 Paget, F.
 Palmer, W. L.

 Raggi, J. G.
 Rankin, Dr. A. C.
 Remy, Dr. jur. E.
 Rieschick, H.
 Robert, Dr. L.
 Rogers, B. H.
 Ross, D.

 Schaefer, Dr. med. F.
 Slack, T. A.
 Smith, E. Wyon.
 Smith, Dr. M.
 Spigno, A. B.
 Sprater, Major W.

 Thong Thicayu, Capt. Mom Chao

 Ward, T. R. J., C. I. E., M. V. O.
 Webb, G. E.
 Weeks, W. G.
 Williamson, W. J. F.
 Wolf, G.

 Yates, H. C. St. J.

LIST OF WORKS ON NATURAL HISTORY RELATING TO SIAM.

Author.	Title of Work.	Price.	Publisher.
	ZOOLOGY.		
	GENERAL.		
	Cambridge Natural History, 10 vols.	17s. per vol.	
	MAMMALS.		
W. T. Blanford	Fauna of British India. 1 vol. 1891.	£1-0-0	Taylor and Francis, Red Lion Court, Fleet Street, London.
Capt. S. S. Flower	On the Mammalia of Siam and the Malay Peninsula. 1900.		Proceedings of Zoological Society of London.
	BIRDS.		
E. W. Oates	A Handbook to the Birds of British Burma. 2 vols. 1883 (out of print).	15s.	R. H. Porter, 6 Ten-terden Street, London, W
E. W. Oates and W. T. Blanford	Fauna of British India. 4 vols 1889-1898.	65s.	Taylor and Francis, Red Lion Court, Fleet Street, London.
Douglas Dewar	Indian Birds. A Key to the Common Birds of the Plains of India. Companion volume to the Bird volumes of the Fauna of British India.	Rs. 5-4-0	John Lane, The Bodley Head, Vigo Street, London.
H. C. Robinson and C. B. Kloss	On Birds from the Northern Portion of the Malay Peninsula.		"The Ibis," October, 1910 and January 1911.

Author.	Title of Work.	Price.	Publisher.
E. C. Stuart Baker	Indian Ducks and their Allies. (out of print)	Rs. 50.	
Do. Do	Indian Pigeons and Doves. 1913.	Rs. 37-8-0	Witherby and Co., London.
Col. A. Le Mesurier	Game, Shore and Water Birds of India. 1904.	Rs. 12-4-0	W. Thacker and Co., 2 Creed Lane, London.
Hume and Marshall.	Game Birds of India. 1899, (out of print).		
Frank Finn	How to know the Indian Waders. 1906.	Rs. 3-8-0	Thacker, Spink and Co., Calcutta.
Do. Do.	The Waterfowl of India and Asia. 1909.	Rs. 2-8-0	Do. Do.
Do. Do.	The Game Birds of India and Asia. 1911.	Rs. 3-0-0	Do. Do.
Do. Do.	The Birds of Calcutta. 1904.	Rs. 1-12-0	Do. Do.
K. G. Gairdner	List of the Commoner Birds found in Siam. 1912.		Journal of the Siam Society, Vol. IX, Part I.
Count Nils Gyldenstolpe	Birds collected by the Swedish Zoological Expedition to Siam, 1911-12.		R. Friedlander und Sohn, 11 Carlstrasse, Berlin. Wm. Wesley & Son, 28 Essex Street, Strand, London. Librairie C. Klincksieck, 11 Rue de Lille, Paris.
E. Oustalet	Les Oiseaux de Cambodge, Laos et l'Indo-Chine.* 2 parts. 1898 & 1904.		Arch. Mus. Paris.

[* This work was unknown to us at the time of writing the Editorial. Unfortunately the author died before the 3rd part could be written.—Eds.]

Author	Title of Work.	Price.	Publisher.
	REPTILIA AND BATRACHIA.		
G. A. Boulenger	Fauna of British India. 1 vol. 1890.	£1-0-0	Taylor and Francis, Red Lion Court, Fleet Street, London.
G. A. Boulenger	Fauna of the Malay Peninsula. 1 vol. 1913.	86	Taylor and Francis, Red Lion Court, Fleet Street, London.
Major F. Wall	The Poisonous Terrestrial Snakes of our British Indian Dominions (including Ceylon) and how to recognize them, 1913.	Rs. 3	Bombay Natural History Society.
Do. Do.	Monograph of Sea-Snakes.	7s.	The Asiatic Society.
M. F. Mocquard	Les Reptiles de l'Indo-Chine. 1907.		Librairie Maritime et Coloniale, 17 Rue Jacob, Paris.
Capt. S. S. Flower	Second collection of Reptiles made in the Malay Peninsula and Siam, 1899.		Proceedings of Zoological Society of London.
Do. Do.	Second collection of Batrachians made in the Malay Peninsula and Siam, 1899.	12s.	Do. Do.
G. A. Boulenger	Catalogue of Reptiles in the British Museum. 1884-1896. 7 vols. Chelonians, 1 vol. Lizards, 3 vols. Snakes, 3 vols.	£7-5-6	
	FISHES.		
	Fauna of British India, 2 vols.	£2-0-0	Taylor and Francis, Red Lion Court, Fleet Street, London.

Author.	Title of Work.	Price.	Publisher.
LEPIDOPTERA.			
Distant	Rhopalocera Malayana. Description of the Butterflies of the Malay Peninsula, 46 coloured plates. 1882-86.		
Marshall and Nicciville	The Butterflies of India, Burma and Ceylon, 5 vols Vol I. 1886. Vol II. 1888. Vol III. 1890.		
Moore	Lepidoptera Indica, 480 coloured plates. 5 vols. 1890-1902.		
Moore	The Lepidoptera of Ceylon, 215 coloured plates. 3 vols. 1880-87.		
Dr. Adalbert Seitz	The Macrolepidoptera of the World (Issued in Parts. In publication).	1s. 6d. per Part.	
FLORA.			
Sir J. D. Hooker	The Flora of British India. 7 vols. 1875-1897.		L. Reeve & Co., 6 Henrietta Street, London.
S. Kurz	Forest Flora of British Burma. 2 vols. 1877.		Superintendent of Government Printing, Calcutta.
Sir Dietrich Brandis	Indian Trees. 1907.		Archibald Constable and Co., 10, Orange Street, Leicester Square, London.
W. G. Craib.	Contributions to the Flora of Siam. <i>Dicotyledones</i> . 1912. <i>Monocotyledones</i> . 1913.		University of Aberdeen, Scotland.

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EDITED BY

Malcolm Smith and W. J. F. Williamson.

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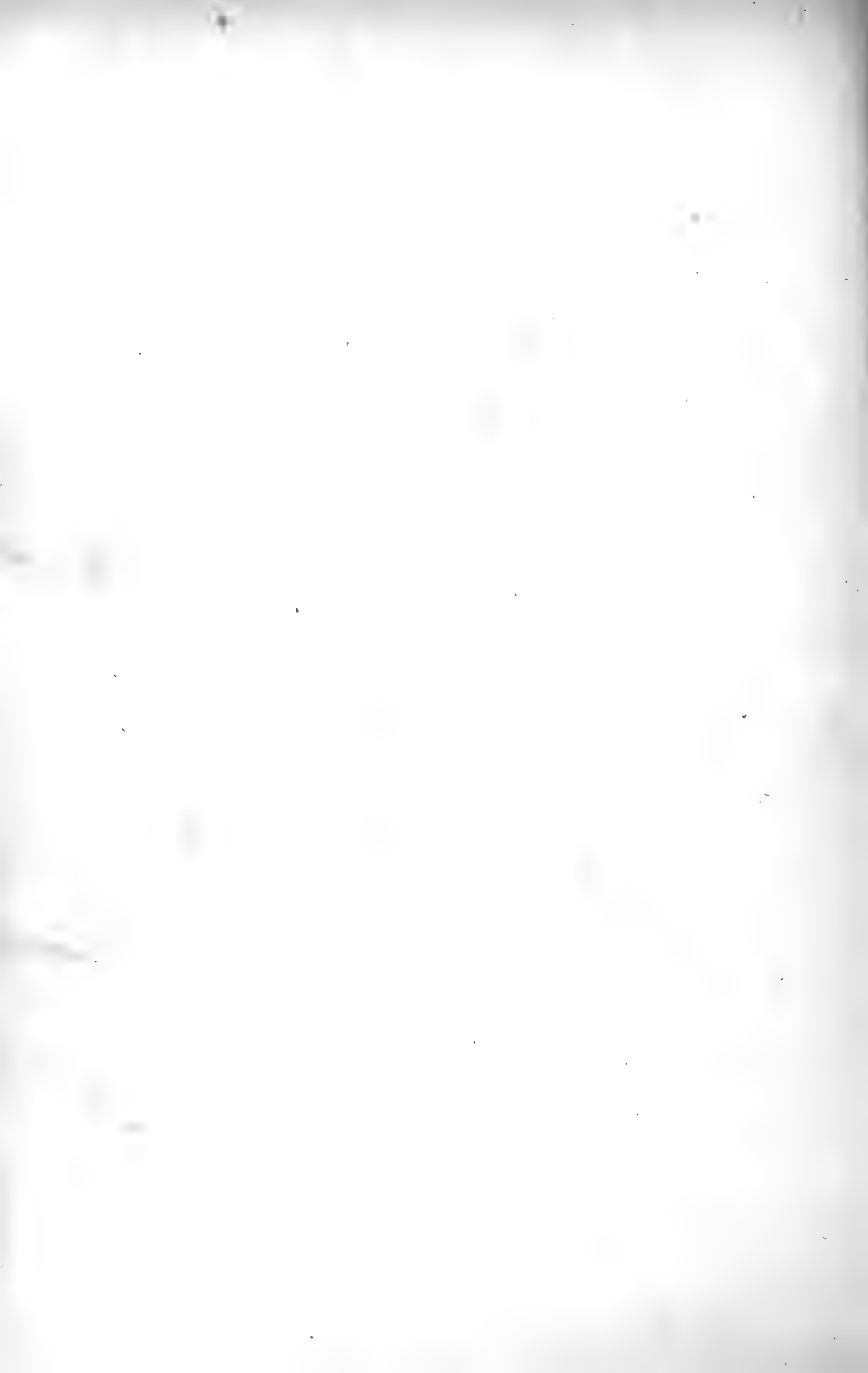
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No. 2.

DESCRIPTIONS OF NEW REPTILES
FROM SIAM.

BY G. A. BOULENGER, LL.D., D.SC., PH.D., F.R.S.

WITH NOTES.

BY MALCOLM SMITH, M.R.C.S., L.R.C.P.

I am indebted to Dr. Malcolm Smith for examples of the following species of Reptiles which he suspected to be new to Science, and which he has requested me to describe.

LYGOSOMA ANGUINOIDES.* †

Section *Lygosoma*. Limbless. Snout short, rounded, projecting feebly beyond the mouth. Nostril pierced in the anterior part of a large nasal, which is narrowly separated from its fellow: rostral produced between the nasals: frontonasal nearly twice as broad as long, forming a narrow suture with the rostral, and a broad one with the frontal: praefrontals very small and widely separated: frontal as long as broad, in contact with the first (largest) supraciliary and with the first supraocular: three supraoculars, first largest: five supraciliaries: frontoparietals distinct, about as large as the interparietal: parietals narrow, forming a suture behind the interparietal, followed by a pair of nuchals: six upper labials, first largest: symphysial very

* [The illustration of this new lizard is not yet completed and will appear in the next number of the Journal. Eds.]

large: ear completely hidden. 22 smooth scales round the middle of the body, dorsals a little larger than laterals and ventrals. A pair of enlarged preanals. Tail thick. Pale greyish brown, with a pair of dark brown streaks along the middle of the back and a broader dorso-lateral pair; below the latter and on the belly, brown lines run between the series of scales.

Total length 95 mm.: tail (reproduced) 35 mm.

The single specimen described was found beneath a log at Bangtaphan.

This species is very closely related to the Australian *L. ophioscincus*, Blgr. (*Ophioscincus australis*, Peters), which differs in the rostral forming a broader suture with the frontonasal and in the broader frontal and parietals.

SIMOTES INORNATUS.

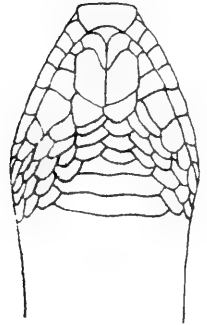
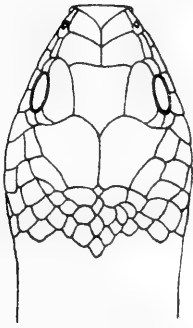
Nasal divided; portion of rostral seen from above, as long as its distance from the frontal; suture between the internasals longer than that between the praefrontals; frontal as long as its distance from the end of the snout, as long as the parietals; loreal a little longer than deep; one preocular and two postoculars; no suboculars; temporals 1+2; eight upper labials, fourth and fifth entering the eye; four lower labials in contact with the anterior chin-shields, which are nearly twice as long as the posterior. Scales in 15 rows. Ventrals 171; and entire; subcaudals 42. Uniform pale brown above, yellowish white beneath.

Total length 580 mm.; tail 90 mm.

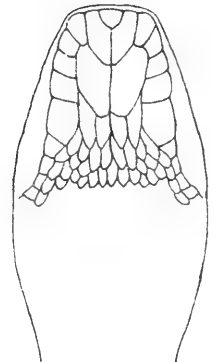
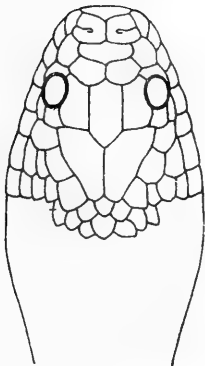
A single male specimen from Nong Kai Ploi, E. of Sriracha.

The number of rows of scales easily distinguishes this species from *S. violaceus*, Cantor, to which it is most nearly related.

[This snake was collected and kindly forwarded to me by Mr. P. A. R. Barron, of the Borneo Company, to whom I am also indebted for a second specimen, which differs from the type description in the following particulars. Portion of rostral seen from above, shorter than its distance from the frontal: suture between the internasals equal to to suture between the praefrontals. Loreal as long as deep. Ventrals 175. Subcaudals 40. Color. Above, dull, salmon-red (much brighter, I am informed, in life) and with very faintly marked dark greyish narrow cross-bars. Below, with indistinct, small, squarish spots, placed laterally, in the posterior half of the body and tail. This specimen has been in my possession for some months, and the handsome red coloring has gradually faded until now it is nearly of the brown hue described



SIMOTES INORNATUS. X2.



HYPsirrhina SMITHII. NAT. SIZE.



by Mr. Boulenger. Mr. Barron who saw both specimens when fresh informs me, however, that the first one never showed any red coloration. The drawing of the head, by Mr. C. L. Groundwater, is from the second specimen, which will be also presented to the British Museum.—M. S.]

HYSIRHINA SMITHII.

Rostral twice as broad as deep; internasal single, a little more than twice as broad as long; frontal scarcely broader than the supra-ocular, twice as long as broad, as long as its distance from the end of the snout, a little shorter than the parietals; loreal as long as deep, in contact with the internasal; one praeocular, the lower part, on one side, separated off as a subocular, two postoculars; temporals 1+2-3; eight upper labials, fourth entering the eye; five lower labials in contact with the anterior chin-shields; posterior chin-shields hardly distinguishable from the surrounding scales. Scales in 21 rows. Ventrals 121; anal divided; subcaudals 56. Head and anterior part of the body grey above, with a zigzag vertebral band formed of confluent large black spots, and black on the sides and beneath, the black being interrupted by light pinkish bars which are continued as irregular series of yellow spots across the belly; posterior part of body iridescent black, with incomplete narrow annuli, which are pinkish above and yellow beneath; upper surface of head spotted with black, with a black U-shaped mark from the angle of the mouth to the parietal. Tongue whitish (in life).

Total length 400 mm.; tail 80 mm.

A single female specimen from the river Menam at Bangkok.

This species, named after Dr. Malcolm Smith, is very closely allied to *H. jagorii*, Peters, from which it differs in the narrower frontal shield and, very strikingly, in the coloration.

[This snake was caught by a small boy whilst shrimping off Messrs. L. T. Leonowens, Ltd., and kindly sent me by Mr. Miller. I kept it alive for four months. It had the sluggish disposition that is found in so many of the fresh-water snakes, and never made any attempt to bite when handled. It was not strictly aquatic, and lived quite as much on the land as in the water. On one occasion it ate a fish, but afterwards refused all food.—M.S.]

Dr. Malcolm Smith has pointed out to me that two distinct forms have been confounded by Günther and by myself under the name of *Simotes taeniatus*. One, with 17 rows of scales and a blackish spot

at the base of the tail and another at the end, has been figured by Günther (Rept. Brit. Ind., pl. XX. fig. A). The other, with 19 rows of scales and without the spots on the tail has been described and figured by Jan as *S. quadrilineatus*. Unfortunately, the latter name is a strict synonym of *S. taeniatus*, Günther's original description (P. Z. S. 1861, p. 189) having been drawn up from a single specimen of the same form; so that I am compelled to propose a new name, var. *Mouhoti*, for the snake figured in the Reptiles of British India. I should have regarded these two forms as species, as Dr. Malcolm Smith, who has examined many specimens, finds them always quite distinct from each other, but for the fact that a specimen from Laos in the British Museum combines the number of scales of *S. taeniatus* with the coloration of *S. Mouhoti*. Dr. Malcolm Smith further points out a difference in the colour of the tongue, which is entirely reddish in the former, and black at the base and at the tips in the latter.

[I have now examined altogether some 40 specimens of these two forms from various parts of the country, and the fact that I had so far always found them distinct from each other, led me to think that they should be ranked as species. Both are equally common in Bangkok, but the form with 19 rows of scales is rare outside. The following are the various points of difference, drawn up from notes of my own specimens.

<i>S. taeniatus.</i>	<i>S. Mouhoti.</i>
(Drawn up from 15 specimens.)	(Drawn up from 25 specimens.)
19 rows of scales.	17 rows of scales.
Tongue red.	Tongue black at the base and tips.
Posterior head-mark arrow shaped.	Posterior head-mark heart shaped.
No tail-bars or collar.	1 or 2 tail-bars and a more or less complete collar. (Any or all occasionally absent).
Subocular rarely present.	Subocular generally present.
Ventrals 155-167.	Ventrals 144-163.
Temporals 2+2, rarely 1+2.	Temporals 1+2, rarely 2+2.

I should be grateful to any member of the Society who will forward me further specimens for examination. A description of the two forms will be found in the article on the Snakes of Bangkok, in this number.—M. S.]

† THE BIRDS OF BANGKOK.

BY W. J. F. WILLIAMSON.

INTRODUCTION.

In the last number of the *Journal*, I published a Preliminary List of the Birds of Bangkok, and stated that, with the present number, I hoped to commence a serial paper giving some account of the appearance, habits, etc., of the birds of this locality.

Comparatively little has been done, up to the present, in the way of a systematic study of the birds of Siam. A few local collections have been made and some papers issued, the earliest, of which I have any record, being Capt. Stanley S. Flower's *Birds of a Bangkok Garden*, published in *The Ibis* in the late nineties of the last century. This includes 28 birds only, and is of very slight value. The same may be said of the list of Siamese birds, numbering 75 species (some of them unidentified), given in an appendix to Mr. H. Warrington Smyth's *Five Years in Siam*, published in 1898. The only part of the country which has been worked with any degree of thoroughness is the western portion of Siamese Malaya, from Trang southward. In 1908 and 1909, this district was visited by Messrs. Robinson and Kloss, of the Federated Malay States Museums, who published in *The Ibis*, in 1910-11, a paper giving a complete list of all the birds obtained or observed by them or their collectors.* The paper in question, which enumerates some 270 species, is the most important contribution yet made to our knowledge of Siamese avifauna. It is to be remarked, however, that the area covered by these contributors includes, not only Trang, but also the adjacent Langkawi group of Islands, together with Perlis and the northern portion of the State of Kedah as far south as the mouth of the Kedah river. These places were all Siamese territory at the time they were visited, but, before the paper was issued, a large part of the area mentioned had passed under British protection by

*As stated by Messrs. Robinson and Kloss, Trang had been previously visited in 1896, 1897 and 1899, by Dr. W. L. Abbott, the well-known American naturalist, who formed a magnificent collection of bird-skins. Unfortunately, however, no full account of this has ever been issued, though a few species have been described.

virtue of the Anglo-Siamese Treaty of 1909. As localities are not always stated by Messrs. Robinson and Kloss, it is possible that some of the birds given in this paper were not found in what is now Siamese territory.

Next in chronological order is Mr. K. G. Gairdner's *List of the Commoner Birds found in Siam*, which was published in 1912 in the *Journal of the Siam Society*, and comprises some 140 species, for the most part personally obtained or observed by Mr. Gairdner in different parts of the country, including 26 in Bangkok. An interesting feature of the list is the attempt which has been made to give the Siamese names of a number of the birds mentioned.

Finally, we have the paper published in 1913 by Count Nils Gyldenstolpe, the Swedish naturalist who spent nearly six months in Siam between November 1911 and May 1912. This contains a list of 191 birds collected or observed in various localities ranging from Sriracha and Koh-si-chang in the south, to about as far as Dene-chai in the north. It is a notable addition to the published lists of our avifauna.

The descriptions in this paper will be as full as is considered necessary to enable the various species to be readily identified, but no attempt will be made to render them technically complete. Further, in order to avoid undue detail, one measurement only will usually be given, viz., the total length of the bird, but collectors are recommended to take and record the following measurements:—

Length. From tip of bill to tip of longest tail feather, with the bird laid flat.

Tail. From root of tail to tip of longest tail feather.

Wing. From bend of wing to tip of longest primary.

Tarsus. From centre of joint connecting tarsus with tibia, to basal joint of middle toe.

Bill. From tip of bill to angle of gape.

No remarks will be made on the nesting habits of the species dealt with. The reason for this omission is two-fold. In the first place, any notes on the subject, however slight, would unduly increase the length of this paper, and so retard its completion. Secondly, one of the members of the Society is making a special study of the nests and eggs of Siamese birds, and it is hoped that he may be in a position before very long to give us the benefit of his observations on this most

interesting feature of bird-life. It has, accordingly, been deemed advisable, at this juncture, to refrain from dealing with the subject in what would necessarily (owing to lack of adequate material) have been an incomplete manner.

As was the case with the Preliminary List published in the last number of the *Journal*, the classification and nomenclature of the birds here described are taken from the *Fauna of British India—Birds*, by Oates and Blanford, and the numbers in brackets are those of that work. Species described in this paper, which were not included in the Preliminary List, are marked with an asterisk. (*)

The area within which the birds dealt with have been obtained, is that comprised by the City and its suburbs, together with the surrounding country within easy walking distance thereof. This limitation of area has been adopted with a view to rendering the paper of particular use to those residents of the Capital (and they are doubtless many) whose opportunities for observation are confined to Bangkok and its immediate neighbourhood.

The following is a list of the principal books and papers to which references will be made, but the names of the authors only will be quoted, in order to avoid repetition of the titles of the works:—

- Blanford.....W. T. Blanford. *The Fauna of British India—Birds*. Vols. III and IV. 1895 and 1898.
- Gyldenstolpe.....Count Nils Gyldenstolpe. *Swedish Zoological Expedition to Siam*. 1913.
- Oates.....Eugene W. Oates. *The Fauna of British India—Birds*. Vols. I and II. 1889 and 1890.
- Robinson.....Herbert C. Robinson. *A Hand-List of the Birds of the Malay Peninsula, south of the Isthmus of Kra*. 1910.
- Robinson and Kloss...Herbert C. Robinson and C. B. Kloss. *On Birds from the Northern Portion of the Malay Peninsula, including the Islands of Langkawi and Terutau*. *The Ibis*. 1910-11.

It may be appropriate to make a few remarks here on the subject of the Siamese names for birds. In Siamese, the word for Bird is นก (*Nok*), and this is usually prefixed to the particular species to be described—thus, นก ตีทอง (*Nok tī t'hong*, literally, the Goldbeater-bird, *i.e.*, the Coppersmith or Barbet), in much the same way as we say Weaver-bird or Tailor-bird. In English, however, these descriptive names are the exception, whereas in Siamese they are the rule—only a very few birds not having the syllable *Nok* prefixed to their names, such as กา (*Kā*, Crow), เริง (*Rēng*, Vulture), etc. Domestic poultry, again, and other allied species, have special names of their own, as ไก่ (*Kai*, Fowl), with its derivatives ไก่จวง (*Kai-nyuang*, Turkey), ไก่ฟ้า (*Kai-fa*, Pheasant), ไก่ป่า (*Kai-pā*, Jungle Fowl), ไก่นา (*Kai-nā*, literally, Field Chicken, a name properly applicable to the large Grey Quail); เป็ด (*Ped*,* Duck), with its derivatives เป็ดน้ำ (*Ped-nān*, Teal), etc.; ห่าน (*Han*, Goose); and หงษ์ (*Hongs*,† Swan).

The term นก กระฉับ (*Nok krachib*) is a general one applied to small birds of more or less inconspicuous plumage, and is also used, with descriptive affixes, to denote particular species—thus นก กระฉับ กระไซ (*Nok krachib krasai*), *i.e.*, the common Tailor-bird. It has also to be remarked that, colloquially, the prefix ชี (*I*),‡ denoting a female of low rank, is often applied to a number of birds, *e. g.*, ชีกา (*I-kā*, Crow); ชีเริง (*I-rēng*, Vulture); นก ชีแฉ่น (*Nok i-ṅn*, Swallow), &c. It is, however, usually omitted both in polite conversation and in writing.

Needless to say, Siamese names vary according to locality, as do popular names in most countries, and even in the same locality different names will often be given to the same bird—probably owing to want of exact knowledge of the bird itself. I have endeavoured to

*The *d* of *Ped* is pronounced more like a *t*.

†The *s* of *Hongs* is silent.

‡To be pronounced like the English vowel *E*.

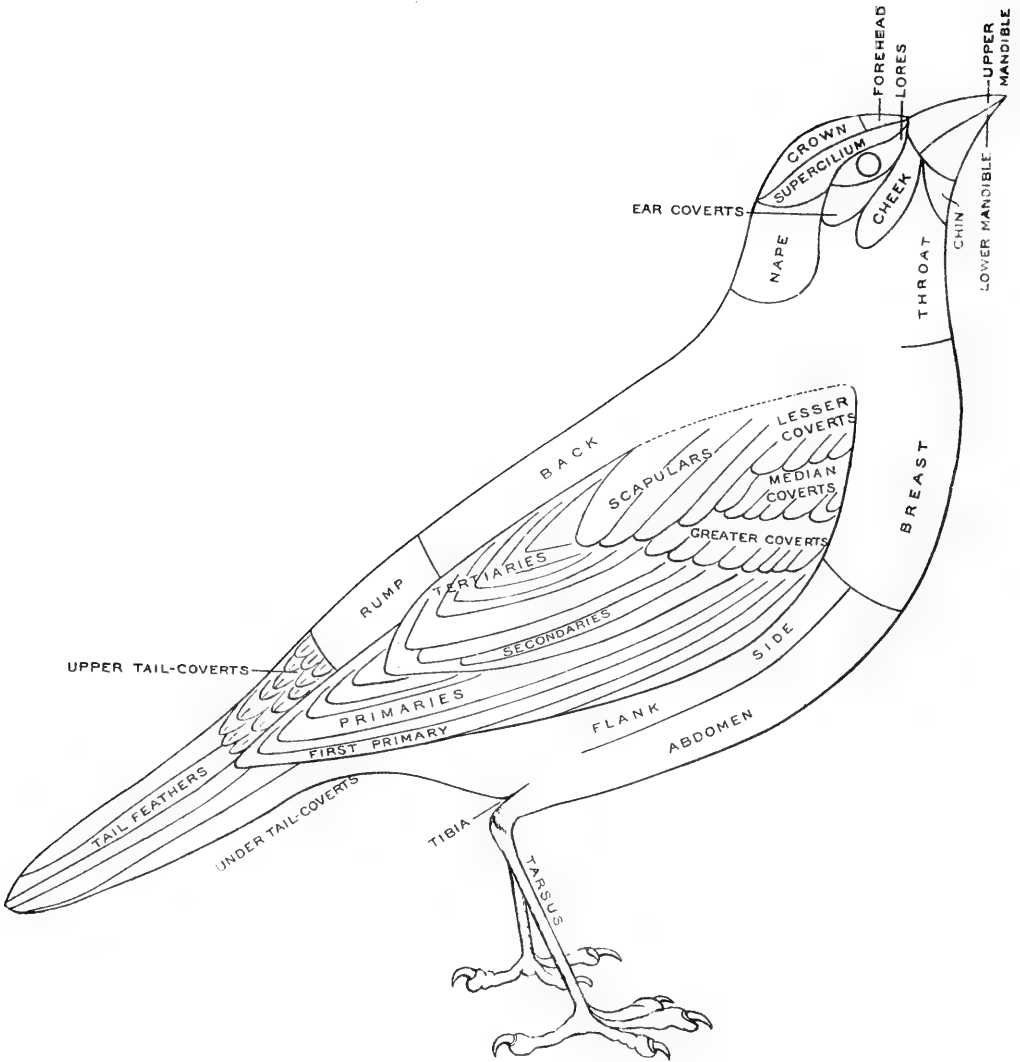


Diagram of Bird.

sift these variations, and the Siamese names given in this paper are, it is believed, those by which the birds concerned are generally known in Bangkok. In this matter, and in the orthography of the words, I have received most valuable aid from H. R. H. Prince Chandaburi and H. H. Prince Bidyalankarana, to whom my grateful thanks are tendered.

In transliterating Siamese names, for the purposes of this paper, aspirated consonants are represented by the corresponding unaspirated letters, followed by an *h*,—thus the aspirated *k* is written *kh*, the aspirated *ch* is written *chh*, and so on. In the case, however, of the aspirated *p* and *t*, an apostrophe (') is introduced between the letter concerned and the accompanying *h*—as *p'h* and *t'h*, to avoid the possibility of the *ph* or *th* being pronounced like an *f*, as in the English word *pheasant*, or like *th*, as in the English words *then*, *thin*, &c. All vowels are to be pronounced as in Italian, and long ones are marked with a stroke over them—thus *ā*. For the transliteration of the names, I alone am responsible.

The accompanying plate shows the diagram of a bird, with the names of the various parts of its body and plumage. Most of the terms need no explanation, but the following definitions may be useful:—

- Lores.* Space in front of the eye.
- Primaries.* Outermost 9 or 10 quills of the wing.
- Secondaries.* Quills springing from the radius and ulna.
- Supercilium.* Space between the eye and the crown.

I have again to express my great obligations to Mr. H. C. Robinson, Director of Museums, Federated Malay States, for his kindness in identifying, or confirming the identification of, the birds mentioned in this paper.

ORDER—**PASSERES.**Family *CORVIDÆ*—Crows, Magpies, &c.† 1 (4). *Cervus macrorhynchus.* *The Jungle-Crow.*

Siamese, กจ (Ka).

Description. Length, up to 508 mm. (20 in.). Colour, black throughout—all the feathers, except those of the neck, having a decided gloss.

Bill and legs, black. Iris, dark brown. In young birds which I have examined, the base of the bill and the gular skin are pale pinkish flesh-colour, while the iris is bluish grey, changing gradually to dark grey, and thence to dark brown, as the bird gets older.

Habits, &c. This bird is exceedingly abundant in Bangkok, and is a regular frequenter of our gardens all the year round.

The majority of the crows of Bangkok appear to roost on the west side of the river, though the high trees round some of the Wats and other old buildings on the east side are also favourite roosting places. Towards sunset, crows from all parts of Bangkok may be seen flapping their leisurely way (always in a westerly direction) to the places where they are to spend the night.

Distribution. Also recorded from Trang (Robinson and Kloss), and Eastern, Central and Northern Siam (Gyldenstolpe). Probably to be found almost everywhere throughout the country.

[Note. Gyldenstolpe states that *C. insolens* (The Burmese House-Crow) is "very common in Bangkok and its neighbourhood" *C. insolens* is smaller than the present species, and has a conspicuous dull brown neck. I have never seen any such bird here.]

† 2 (21). *Crypsirhina varians.* *The Black Racket-tailed Magpie.*

Siamese, กจกน (Ka wēn).

Description. Length, 330 mm. (13 in.), of which the tail measures nearly 203 mm. (8 in.). Whole plumage black, with a bronze-green metallic gloss, except on the forehead and round the

eye, where the feathers are of a dull velvety black. The centre pair of tail feathers are noticeably spatulate in form.

Bill and legs, black. Iris, pale blue.

Habits, &c., This "fine little Magpie", as it is called by Oates, occurs sparingly in the suburbs of Bangkok, and though it usually keeps away from the neighbourhood of houses, I have seen it in my compound in Sathon Road several times. It appears to be resident here, as my specimens, though not numerous, were obtained at intervals throughout the year.

This bird is strictly arboreal in its habits, and I have always observed it either in pairs, or three or four together (perhaps a family), searching the tips of branches of trees, including bamboos, for insects—the while uttering its not unmusical single note, *kēh*.

Distribution. The only other recorded locality is Northern Siam (Gyldenstolpe), but I have met with it also at Ayuthia and Koh Lak.

Family CRATEROPODIDÆ—Laughing Thrushes, Babblers, Etc.

†*3 (160). *Turdinus abbotti*. *Abbott's Babbler*.

Description. Length, 152 mm. (6 in.). Upper plumage, olive brown, with a rufous tinge on the back, the rufous becoming brighter on the upper tail-coverts. Chin and throat, whitish, shading into rufous on the breast and abdomen, the lower portion of the abdomen, and especially the under tail-coverts, being brighter rufous.

Distribution. With the exception of Trang, where it is reported as "rather scarce" (Robinson and Kloss), there appears to be no other record of its occurrence in Siam. My single specimen (a male) was obtained in February 1914, near Wat Insri, to the south of Bangkok.

†4 (176). *Mixornis rubricapillus*. *The Yellow-breasted Babbler*.

Description. Length, 127 mm. (5 in.). Forehead and crown, dull ferruginous; rest of upper plumage, olive green. Chin, throat and breast, pale yellow with black shaft-stripes; centre of abdomen, plain yellow; remainder of lower plumage, ashy with yellow tinge.

Iris, dull white, Bill, brown. Legs, fleshy horn-colour.

Habits, etc. In Bangkok I have only met with this bird on the west side of the river. It is fairly common there in the fruit and betel-nut gardens which abound in that neighbourhood, and is probably also to be found in other similar localities round Bangkok. The bird hops and flits about bushes and low trees, searching for insects, and is somewhat of a skulker, having the habit of taking refuge in the recesses of a thick bush or bamboo-clump, when alarmed, and is then very difficult to dislodge. Its note is a trisyllabic one, *or-r chee chee*.

Distribution. Gyldenstolpe records this bird from Northern Siam, and I have procured it both at Ayuthia and at Koh Lak, in scrub jungle. Oates states that it is found in Tenasserim to a little south of Tavoy, where it is replaced by an allied species, *M. gularis*, which occurs in Southern Tenasserim and the Malay Peninsula to Sumatra. As Koh Lak is about 260 km. (160 miles) south of Tavoy, it would appear that *M. rubricapillus* extends lower down in this country than it does in Burma, and it will be interesting to see what is its southerly limit in Siam.

† 5 (243). *Aegithina tiphia*. *The Common Iora*.

Siamese, นกกระเรียนสีถั่ว (Nok krachib si t'hua†).

Description. Length, 137 mm. (5.4 in.). *Male.* Upper plumage, more or less black in summer, yellowish green in winter, except the wings and tail which are always black—the former with two white bars and with the quills narrowly edged with yellow. Lower plumage, bright yellow from chin to breast, shading into greenish yellow from the abdomen to the under tail-coverts. *Female.* Entire upper plumage, greenish at all seasons, the tail dusker, and the quills blackish brown with yellowish edges—the two white bars being present, as in the male. Lower plumage, greenish yellow.

Iris, yellowish white. Bill, bluish black. Legs, plumbeous.

Habits, etc. This pretty little bird is a resident species, and is generally found singly or in pairs, searching for its insect food among the leaves of trees. While so engaged, it utters its various melodious

† The *b* of *krachib*, in this and other places where it occurs, is pronounced more like a *p*. The words *si t'hua* mean "bean-coloured".

notes. One of these is a soft and rather long drawn-out trill, and another is a quick whistling call of *whee-o whee-o*. Its most remarkable note, however, which it not unfrequently utters, is a long, slow whistle of two syllables, corresponding to the musical notes *e* and *g* sharp.

This bird may be looked for in every Bangkok garden, but it is more often heard than seen, owing to its small size, its strictly arboreal habits, and the manner in which its colouration blends with that of the foliage among which it is always found.

Distribution. Also recorded from Northern Siam (Gyldenstolpe), and Trang (Robinson and Kloss).

† 6 (288). *Otocompsa emeria*. *The Bengal Red-whiskered Bulbul.*

Siamese, นกปรอดหัวโขน (Nok parod hua khōn†).

Description. Length, 190 mm (7.5 in.). Forehead and crown, black—the feathers of the latter being elongated into a conspicuous crest 19 mm. (.75 in.) long; a small crimson patch below and behind the eye; upper neck, back and wings, brown; tail, dark brown—the outer four or five feathers on each side, tipped with white. Lower plumage, white, except the under tail-coverts, which are crimson.

Distribution. Trang (Robinson and Kloss); Phrae (Gyldenstolpe). Mr. E. G. Herbert informs me that it is common at Paknampo. I obtained one specimen of this handsome bird in my garden in October 1913, and there is another in the Museum here marked "Bangkok" in, I am told, Flower's handwriting.

† 7 (298). *Pycnonotus analis*. *The Yellow-vented Bulbul.*

Siamese, นกปรอดหน้าผก (Nok parod na nūan‡).

Description. Length, 203 mm. (8 in.). The whole upper plumage, brown, darker on the head; a broad supercilium, white;

† The *d* of *parod*, in the names of this and the next two birds, is pronounced more like a *t*. The words *hua khōn* mean "mask-headed."

‡ The words *nā nūan* mean "powdered-faced".

lores, black; cheeks, chin and throat, whitish. Breast, brown; abdomen, whitish brown, the sides darker; under tail-coverts, sulphur yellow.

Iris, brown. Bill and legs, black.

Habits, &c. This is a resident bird, and is regularly met with in our gardens, though on the whole it occurs somewhat sparingly, being very much less common than the next species. From the latter it may be distinguished by the amount of white on the sides of its head, the brighter yellow of its under tail-coverts, and its more melodious liquid notes. It is generally to be seen in pairs, and is a somewhat shy bird.

Distribution. Robinson and Kloss only came across two or three specimens of the Yellow-vented Bulbul in Trang. I can find no other record of its occurrence in this country.

+ 8 (306). **Pycnonotus blanfordi.** *Blanford's Bulbul.*

Siamese, นกปรอดสวน (Nok parod suan.)

Description. Length, 203 mm. (8 in.). The whole upper plumage, olive brown, darker on the head and paler on the rump; ear coverts, white. Chin, dull whitish brown; rest of lower plumage, ashy brown, paling off to yellowish brown on the under wing-coverts and tail-coverts.

Iris, dark grey. Bill, brown, darker at tip and pale flesh-colour at base of lower mandible. Legs, dark pinkish or plumbeous brown, sometimes with a bronzy tinge.

Habits, &c. This is one of the most abundant birds in Bangkok and is a resident of our gardens all the year round—sometimes entering houses also. Despite its plain and inconspicuous plumage, it is always in evidence, by reason both of its numbers and its harsh notes. It has a variety of these—among the commonest being a noisy and guttural *cha-cha-cha* or *chak-chak-chak*, as well as a *chika-chika-chika*. These are repeated several times in rapid succession, after which there is a lull. The bird also has an alarm cry of *cr-r-ju, cr-r-eh*.

Blanford's Bulbul appears to live on fruit and berries, as well as on insects, as I have observed the parent birds carrying both kinds of food to the young ones in their nest.

In the Siamese name, the word *suan* means "garden," and is a

not inappropriate descriptive term. The bird is, however, commonly known as *Nok parod* only.

Distribution. So far only reported from Northern Siam (Gyldenstolpe), but probably occurs over a large part of the country I have met with it as far south as Koh Lak.

Family *DICRURIDÆ*—Drongos.

† 9 (327). *Dicrurus ater.* *The Black Drongo.*

Siamese, นกแซงแซวแกลบ (Nok sēng sēo klēb†).

Description. Length, about 279 mm. (11 in.). In very old birds, the whole plumage is black, glossed with steel-blue, younger birds having the under tail-coverts tipped with white. In those still younger, the colour is brownish black, the feathers of the lower plumage having white tips. The tail is forked to a depth of about 38 mm. (1.5 in.)

Iris, dark brown to reddish brown and deep lake-red. Bill, black. Mouth, blackish. Legs, blackish brown to black.

Habits, etc. This is the common little black bird with the forked tail which is seen everywhere in Bangkok from the beginning of October to the end of March—a few specimens lingering on almost throughout April.

The Black Drongo (or King-Crow, as it is usually called by Europeans in India) feeds entirely on insects, which it usually takes on the wing by swooping on them from some exposed point of vantage, though it sometimes descends to the ground for the purpose. Its notes are cheerful, with a soft, metallic quality, and almost approach the beginnings of a song at times.

In the Siamese name of this bird, the word *klēb* signifies “lesser”, and serves to distinguish it from the Racket-tailed Drongo, which is larger. In common parlance, however, this bird is merely the *Nok sēng sēo*.

Distribution. Also recorded from Eastern, Central and Northern Siam (Gyldenstolpe).

† The *b* of the word *klēb* is pronounced more like a *p*.

†10 (332). *Dicrurus leucogenys*. *The White-cheeked Drongo*.

Siamese, นก แพรง แพร่ สี เทา (Nok sēng sēo sī t'hao).

Description. Length, nearly 279 mm. (11 in.). Whole upper plumage grey, except the forehead, the ends of the first 5 or 6 primaries, and the shafts of the wing and tail feathers, which are black. Lores, and sides of head, white. Lower plumage, pale grey, the under tail-coverts whitish. The tail is forked to the extent of about 38 mm. ($1\frac{1}{2}$ in.). In young birds, the grey of the plumage is darker, and the white of the cheeks duller and smaller in extent.

Iris, reddish brown to crimson lake. Bill and legs, black.

In the Siamese name, the words *sī t'hao* mean "ash-coloured"—a quite appropriate term.

Habits, etc. Very similar to those of the preceding species. I have only found this bird here from October to February, and it appears to occur rather sparingly.

Distribution. Occurs also in Trang (Robinson and Kloss). This bird is not recorded by Gyldenstolpe, so its northern limits are unknown.

†11 (340). *Dissemurus paradisens*. *The Larger Racket-tailed Drongo*.

Siamese, นก แพรง แพร่ หาง บ่วง (Nok sēng sēo hāng būang.)

Description. Length, about 482 mm. (19 in.), † of which the outer tail-feathers account for 305 mm. (12 in.). Whole plumage black, largely glossed with blue. The under tail-coverts, as well as the under wing-coverts, are frequently tipped with white.

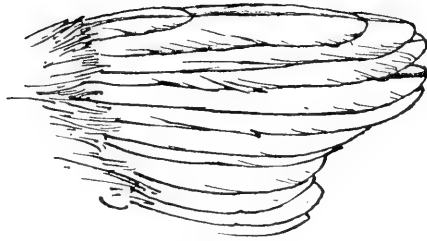
Iris, red in adults, brown in the young (Oates). Bill, and legs, black.

The outer pair of tail-feathers of this bird are very striking—being produced beyond the end of the tail for about 152 mm. (6 in.), of which the basal half is practically nothing but shaft, while the termi-

† This is the length of one of my birds. The longer of Gyldenstolpe's two specimens measured only 425 mm. or about 16.75 in.



A



B

Wings (natural size) of

- A. *Acrocephalus orientalis*. The Eastern Great Reed-Warbler.
- B. *Arundinax aëdon*. The Thick-billed Warbler.

nal portion is webbed on the outer edge only, except at the very tip, for about 76 mm. (3 in.). This webbed portion has a tendency to curl or loop inwards: hence the Siamese name—the words *hāng būang* meaning “loop-tailed.” The forehead has a short tuft of feathers, curling backwards.

Habits, etc. This bird appears to be of strictly arboreal habit, and captures its insect food on the wing—swooping on it from a perch. It has a variety of rich, metallic notes. In Bangkok it is a resident species, and is found throughout the suburbs, but more abundantly in the well-wooded ones, such as on the west side of the river.

Distribution. Robinson and Kloss also record it as occurring throughout the (Malay) Peninsula—and therefore, presumably, in Traung—while Gyldenstolpe met with it in Eastern, Central and Northern Siam.

Family SYLVIIDÆ—Warblers.

† 12 (364). *Acrocephalus orientalis.* *The Eastern Great Reed-Warbler.*

Description. Length, about 190 mm. (7.5 in.). Upper plumage, olive-brown, paler and with a fulvous tinge on the rump and upper tail-coverts. Wings and tail, brown, the feathers edged with fulvous brown. Chin and throat, whitish, shading into fulvous on the breast, abdomen and under tail-coverts. The throat and breast are generally faintly streaked with brown.

Iris, yellowish brown. Bill, dark horny above, dusky flesh-colour or dusky yellow below. Mouth, orange or orange yellow. Legs, yellowish plumbeous.

This bird is very similar in size, colouration and general appearance to *Arundinax ædon* (The Thick-billed Warbler) which is described below, though the bill of the latter is smaller and somewhat differently shaped. The main point of difference, however, is in the comparative length of the first primary, as will be seen by reference to the accompanying Plate, for the drawing of which I am indebted to Mr. E. Healey. In *Acrocephalus orientalis* the first primary is very minute, while in *Arundinax ædon* it is about 25 mm. (1 in.) long.

Habits, etc. This bird is a winter visitor to Bangkok, and is to be found here from October to nearly the middle of May—being one of the last of our cold weather visitants to depart. I have generally observed it on trees and bushes near our rush-grown canals and roadside ditches, but it is apparently not entirely arboreal in its habits, as I have several times seen it hopping about on the ground. It is, I believe, strictly insectivorous in its diet.

The note of this bird is a loud and harsh *chik-chik* (not unlike the sound produced by a pair of gardener's shears), interspersed with a harsh *kr-r-r* or *chr-r-r*.

Distribution. This bird does not appear to have been previously recorded from Siam, and I have only met with it, in Bangkok, in the neighbourhood of Khlong Sāthon and Khlong Tē-i, though it is doubtless to be found in suitable localities in other parts of the suburbs.

† 13 (374). **Orthotomus sutorius.** *The Indian Tailor-bird.*

Siamese, นกกระฉิบกระฉูด (Nok krachib krasai).

Description. Length, about 120 mm. (4.75 in.), except in summer, which is the breeding season, when the male is found with the centre pair of tail feathers longer than at other times of the year by 51 mm. (2 in.), or more. Forehead and up to the middle of the crown, rufous—shading off on the remainder of the crown and nape into the yellowish-green of the rest of the upper plumage. Lower plumage, dull white, dusky on the sides of the body, and with a faint rufous tinge on the abdomen; thighs, deeper rufous.

Iris and eyelid, yellowish brown to reddish yellow. Bill, dark horny above, pale flesh-colour below. Legs, reddish flesh-colour.

Habits, etc. The Indian Tailor-bird is one of our permanent residents, and is to be found in every garden in Bangkok. It is a familiar and active little bird, continually on the move, hopping about low trees, bushes, etc., searching for the small insects on which it feeds, and it frequently enters the verandahs of houses for the same purpose. Its note, which is a surprisingly loud one for so small a bird, is a vibrant and penetrating *chiu-chiu-chiu* repeated times without number,

especially during the breeding season. When so calling, a conspicuous black mark is noticeable on each side of the neck, owing to the feathers opening out and showing their black bases.

Distribution. With the exception of Oates' statement that this bird "extends into Siam," and the reference to it in Flower's short list of Bangkok birds mentioned in the introduction to this paper, I can find no other record of its occurrence in this country.

†14 (375). **Orthotomus atrigularis.** *The Black-throated Tailor-bird.*

Siamese, นกกระจิบกระไชยดำ (Nok krachib krasa i kho dam).

Description. Very similar in size and colouration to the preceding species, from which it differs mainly in having the whole of the crown rufous or chestnut, the throat (in the adult male), black, and the edge of the wing, the under wing-coverts and the under tail-coverts, yellow.

Iris, pale reddish brown. Bill, brown above, flesh-colour below. Legs, flesh-colour.

Habits, etc. This bird has much the same habits as the previous species, but keeps to well-wooded tracts, with a good deal of undergrowth. The only locality in which I have met with it here is on the west side of the river, among the fruit and betel-nut gardens in the Bansaikai district, though it is doubtless to be found in other suitable places in the outskirts of Bangkok. It is common in the district mentioned. The notes of this bird consist of a short but pleasant trill, *kr-r-r-rui*, *kr-r-r-rui*, as well as a longer and more liquid *chr-r-r-r-r*.

Distribution. Also occurs in Eastern and Northern Siam (Gyldenstolpe).

†15 (381). **Cisticola cursitans.** *The Rufous Fantail-Warbler.*

Description. Length, about 101 mm. (4 in.). Upper plumage, dark brown, with rufous margins to the feathers, giving the bird a streaked appearance; rump, plain rufous; tail feathers, tipped with white. Lower plumage, buffy white, except flanks and thighs, which are rufous.

Iris, light yellowish brown. Bill, brown above, flesh-coloured below. Legs, pinkish flesh. In the breeding season the mouth is black.

Habits, etc. This small bird is common in the fields round Bangkok, especially those which are fallow. It is fond of soaring in the air, with rather a jerky flight, caused by the momentary closing of its wings after every few beats, and, while so doing, it utters at regular intervals its sharp little staccato note of *chi-chi*. It dives to the ground from a height, with a sudden and almost vertical swoop.

Distribution. I have been unable to trace any previous record of the occurrence of this bird in Siam.

† 16 (393). **Arundinax aëdon.** *The Thick-billed Warbler.*

Description. Length, about 197 mm. (7.75 in.). Upper plumage, fulvous olive-brown, brightest on the rump; lores, whitish. Chin and throat, buffish white; remainder of lower plumage, yellowish brown, paler on the centre of the abdomen.

Iris, brown. Bill, dark brown above, flesh-colour below. Mouth, salmon-colour. Legs, plumbeous.

As already mentioned, this bird is very similar in appearance to *Acrocephalus orientalis*, from which, however, it is readily distinguished by its comparatively long first primary, vide Plate, page 83.

Habits, etc. This is a cold weather visitor, though apparently not very common. I have obtained it from October to April.

Distribution. Gyldenstolpe also records this bird (under the name of *Luscinola aëdon*) from Den Chai, in Northern Siam, where he obtained a single specimen.

† 17 (410). **Phylloscopus fuscatus.** *The Dusky Willow-Warbler.*

Description. Length, 133 mm. (5.25 in.). Upper plumage, earthy brown, with a yellowish tinge on the rump; a distinct whitish supercilium from the forehead to the nape. Lower plumage, yellowish brown, whiter on the chin, throat and centre of abdomen.

Iris, brown. Bill, dark brown above, dusky yellow below. Mouth, yellow. Legs, dusky flesh-colour to greenish yellow.

Habits, etc. This bird is only found here in the cold weather, and is fairly common in our gardens during that period. My specimens were obtained from November to April. It flits and hops about bushes and low trees, searching for small insects, and has a sharp little note of *chik*, repeated at intervals.

Distribution. There appears to be no previous record of the occurrence of this bird in Siam.

+ 18 (417). **Phylloscopus superciliosus.** *The Crowned Willow-Warbler.*

Description. Length, about 101 mm. (4 in.). Upper plumage, olive-green, darker on the crown; a distinct greenish yellow supercilium from the forehead to the nape; two pale yellow bars on the wings, most of the quills of which have narrow whitish tips. Lower plumage, whitish to yellowish white.

The crown has an irregular and indistinct longitudinal streak of greenish grey (which, however, is not always visible), from which the bird derives its English name.

Iris, brown. Bill, brown above, yellowish white below. Mouth, yellow. Legs, brownish flesh-colour.

Habits, etc. This small bird is a cold weather visitor, from October to about January, and is fairly common in our gardens during those months. It appears to frequent trees more than bushes, and is always on the move, hunting for its small insect prey, which it occasionally takes on the wing by a sudden dart of a few inches from its perch. It continually jerks its wings, while flitting about the branches, and has a pretty little note of *tweet, tweet*, repeated several times.

Distribution. Also recorded from Trang (Robinson and Kloss), and Eastern and Northern Siam (Gyldenstolpe).

+ 19 (420). **Acanthopneuste borealis.** *The Arctic Willow-Warbler.*

Description. Length, 122 mm. (4.8 in.). Upper plumage, dark olive-green, lighter on the rump; a well-defined yellowish white supercilium reaching from the forehead to the nape; two yellowish

white wing-bars. Lower plumage, yellowish white, dusky brown on the flanks.

Iris, brown. Bill, dark brown above, yellowish horn-colour below, dusky at the tip. Mouth, yellow. Legs, yellowish brown.

Habits, etc. This bird also is a winter visitor, and has much the same habits and note as *Phylloscopus fuscatus* (page 86), to which it also bears a close general resemblance. The present species may, however, be distinguished by its very minute first primary (that of *P. fuscatus* being fully one-third the length of the wing), by the greenish tinge on its upper plumage, the yellowish tinge on its lower parts, and the presence of the yellowish white bars on the wings. These bars, however, are sometimes indistinct, or almost wanting, owing to the wearing away of the feathers.

Distribution. Also recorded from Trang by Robinson and Kloss under the name of *Phylloscopus borealis*.

† 20 (468). **Prinia blanfordi.** *The Burmese Wren-Warbler.*

Siamese, นกกระจับหางเรียว (Nok krachib hang rīo)

Description. Length, from 132 mm. (5.2 in.) to 152 mm. (6 in.), according to season—the tail being longer in the winter. Upper plumage, earthy brown, darker on the head and paler on the rump, which has a fulvous tinge; a whitish supercilium reaching to just behind the eye. Lower plumage, whitish, with buff tinge; thighs, deeper buff; under side of tail feathers, with black bands near the tips.

Iris, clear brownish yellow. Bill, brown, except base of lower mandible, which is pale flesh-colour. Legs, pale reddish yellow.

Habits, etc. A resident species, and common along our suburban khlongs and other similar places with rushes and high grass growing by the waterside. It is a slender little brown bird; with rather a long tail (hence the words *hang rīo*, in the Siamese name, meaning “ tapering-tailed ”), and has a sibilant, almost insect-like, note of *chree-chree-chree-chree* repeated a great many times.

Distribution. Reported also from Eastern and Northern Siam (Gyldenstolpe).

Family LANIIDÆ—Shrikes.

†21 (475). **Lanius nigriceps.** *The Black-headed Shrike.*

Siamese, นกแก้วตาไว (Nok kēo-tā wai).

Description. Length, up to 279 mm. (11 in.). Tail, 157 mm. (6.2 in.).† Upper portion of head from forehead to hind neck, black; back, rump and upper tail-coverts, chestnut; wing-coverts, black; quills, dark brown, tipped with rufous; a white patch at the base of the primaries; tail-feathers, black, most of them tipped with rufous. Chin, throat and breast, white, the last with a rufous tinge; middle of abdomen, whitish; remainder of lower plumage, rather bright rufous.

In the young the upper parts are grey, with a rufous tinge, barred with brown—the bars also appearing on the lower plumage.

Iris, dark brown. Bill, black, except base of lower mandible, which is fleshy plumbeous. Legs, dark brown.

Habits, &c. This is a resident species, and is not uncommon in the more open parts of the suburbs. It is somewhat solitary in its habits, and is usually to be seen perched on a fence, post, or bare branch of a bush or low tree, watching for insects, which it captures on the ground and carries back to its perch to devour. Its flight is rather weak, and is usually confined to a straight course, a few feet above the ground, from one perch to another. While generally rather silent, this bird occasionally utters a harsh single note, repeated three or four times.

The Siamese name signifies “Sharp-eyed Bird”.

Distribution. Also recorded from Central Siam (Gyldenstolpe).

† These are the measurements of one of my birds. The form found in Siam is distinguished from the corresponding Indian bird principally by its greater dimensions—the tail, for instance, measuring about 6.25 in. against 5 in.—and is recorded by Gyldenstolpe, in conformity with the new trinomial system, under the name of *Lanius nigriceps longicaudatus*.

+22 (481). **Lanius cristatus.** *The Brown Shrike.*

Siamese, นกกระเจาหัวโต (Nok krachāb hua tō)

Description. Length, about 197 mm. (7.75 in.). Forehead, whitish; supercilium, white; a broad black band through and beneath the eye; upper plumage, reddish brown, paler and redder on the rump and upper tail-coverts; wing-coverts and quills, dark brown, edged with pale rufous; tail, reddish brown with pale tips. Cheeks, chin and throat, whitish; remainder of lower plumage, fulvous. Birds not fully adult have the eye-streak dark brown and the lower parts more or less barred, according to age—still younger ones also showing traces of bars above. Adult birds are rare.

Iris, dark brown. Bill, dark horn-colour, except basal portion, which is pale plumbeous. Legs, dark plumbeous.

Habits, etc. This is a common cold weather visitor, its period of occurrence being from September to April. It has much the same habits as the preceding species, but is a more familiar bird, nearly always to be found in our gardens, while here, and making its presence known by its harsh notes. It has a variety of these, which it frequently utters.

The words *hua tō*, in the Siamese name for this bird, signify "big-headed". This is a not inappropriate term, as the head is, proportionately, rather large.

Distribution. Reported also from Trang (Robinson and Kloss), and Northern Siam (Gyldenstolpe).

+23 (500). **Pericrocotus peregrinus.** *The Small*

Minivet.

Siamese, นกตีหมกุด (Nok si ch'hom-p'hu dong).

Description. Length, 152 mm. (6 in.). *Male.* Upper parts, dark grey, except the rump and upper tail-coverts, which are orange-scarlet; wings, blackish, all the quills, with the exception of the first four or five primaries, with a median patch varying from pale red to scarlet; tail, blackish, most of the feathers with the terminal portions pale scarlet. Chin, throat and fore neck, blackish grey; breast, scarlet, passing into the saffron of the remainder of the lower plumage. *Female.* Upper plumage, paler grey than in the male; wings, brown,

with the wing-patch, pale orange. Chin, throat and breast, greyish white; remainder of lower plumage, pale yellow.

Iris, not recorded. Bill and legs, black.

Habits, etc. This beautiful little bird is a resident species, and is not uncommon in the well-wooded parts of the suburbs, such as those with extensive areas of betel-nut and fruit gardens. It is of strictly arboreal habit, and goes about in small flocks searching for insects among the leaves and branches of the trees.

The Siamese name for this species means the "Jungle Pink-bird".

Distribution. The only other recorded locality which I can trace is Eastern Siam (Gyldenstolpe), but I have had specimens sent to me from Hua Hin.

† 24 (503). **Pericrocotus cinereus.** *The Ashy Minivet.*

Description Length, 203 mm. (8 in.). Forehead, whitish; lores, a band through the eye, the posterior half of the crown and the nape, black; remainder of upper plumage, dark grey; wings, brown to blackish, with a white wing-bar; tail, black, all the feathers more or less white at the tip with the exception of the two middle pairs. Lower plumage, ashy white, darker on the flanks

Iris, brown. Bill and legs, black.

Habits, etc. Apparently a cold weather visitor and not very common. I have only two specimens of this bird, shot on the east side of the river in January, but Mr. E. G. Herbert informs me that he has seen it in March, on the west side. Neither of my birds is in full adult plumage.

Distribution. There appears to be no previous record of the occurrence of this species in Siam.

† 25 (512). **Artamus fuscus.** *The Ashy Swallow-Shrike.*

Siamese, นกอินทรี (Nok ēn p'hong).

Description. Length, 185 mm. (7.3 in.). Lores, black; head and neck all round, deep grey; back, rump and shorter upper tail-

coverts, grey-brown with a vinaceous tinge; longer upper tail-coverts, whitish; wings, deep grey; tail, dark grey, tipped with whitish. Breast and abdomen, greyish brown, paler on the breast; under tail-coverts, brownish white.

Iris, dark brown (Oates). Bill, plumbeous blue, except tip, which is blackish. Legs, slate-colour (Oates).

Habits, etc. This is probably a resident species, though I have only obtained specimens in July and August. Its flight is strong and graceful, and it spends a considerable part of its time in the air, hawking for insects, but when at rest it usually takes up its position on an exposed branch of a tree. While on the wing, it has a swallow-like appearance; hence its English and Siamese names—the latter meaning “Jungle-Swallow”.

Distribution. The only previous record I can find of its occurrence in this country is Oates’ statement that it “extends into Siam.”

(*To be continued.*)



THE SNAKES OF BANGKOK.

By

MALCOLM SMITH, M.R.C.S., L.R.C.P.

14. *Dryocalamus davisonii*.

Hydrophobus davisonii. Blgr. Faun. Ind., Rept.

I have seen two specimens of this slender and very handsome snake, both from Sapatoom. One of them was found climbing up the wall of Dr. Frankfurter's house, and the other was killed in an adjoining garden.

Dr. Frankfurter's specimen, caught in July, contained 4 eggs, without signs of any embryo. They were narrow and of great length. One, shrunk by spirit, measured 19×7 mm.

Color (in life). White, with large elongated black spots, each one extending over the back and on to the sides. Posteriorly these spots become much smaller and are broken up.

Length. 700 mm.

Distribution. Tenasserim, Siam and Indo-China.

15. * *Zamenis mucosus*. *The Common Rat Snake*.

Siamese, งูเห่า ตาน (ngu hao talān).

A fairly common snake and may be found almost anywhere; frequenting the padi-fields, the compounds in close proximity to the town, and occasionally entering go-downs and out-houses. It may be seen moving about at all hours of the day, and is, I believe, chiefly diurnal in its habits.

Amongst those who have but a slight knowledge of snakes, this species, and less often the succeeding one, are not infrequently confounded with the Cobra. There is some justification for this

* Major Wall, in the last number of the *Journal of the Bombay Natural History Society*, brings forward strong evidence to show that this snake should in future be placed in the genus *Zuocys*.

mistake, as the characteristic feature of the Cobra, its hood, is by no means always apparent, whilst in point of size and in general coloration, there is a considerable superficial resemblance between them.

After the python, the Common Rat Snake grows to a greater size than any other species found here, frequently attaining a length of seven or eight feet. The largest specimen that I have seen was killed one afternoon on the lawn of the Sports Club, where it had taken up its position beneath a chair, in broad daylight and with people about. It measured 2110 mm. (6.11 in.), and had just eaten three large toads, a fact which probably accounted for its incautious behaviour on this occasion. Another has been recorded (*Journ. B. N. H. S.*) measuring 11.6 in., but such a length is quite unusual.

In disposition I have found it a wild and excitable creature, seeking refuge in rapid flight when encountered, but defending itself vigorously if attacked. Although named the Rat Snake, its diet consists chiefly of frogs and toads. It is one of the few snakes which is eaten by the country people.

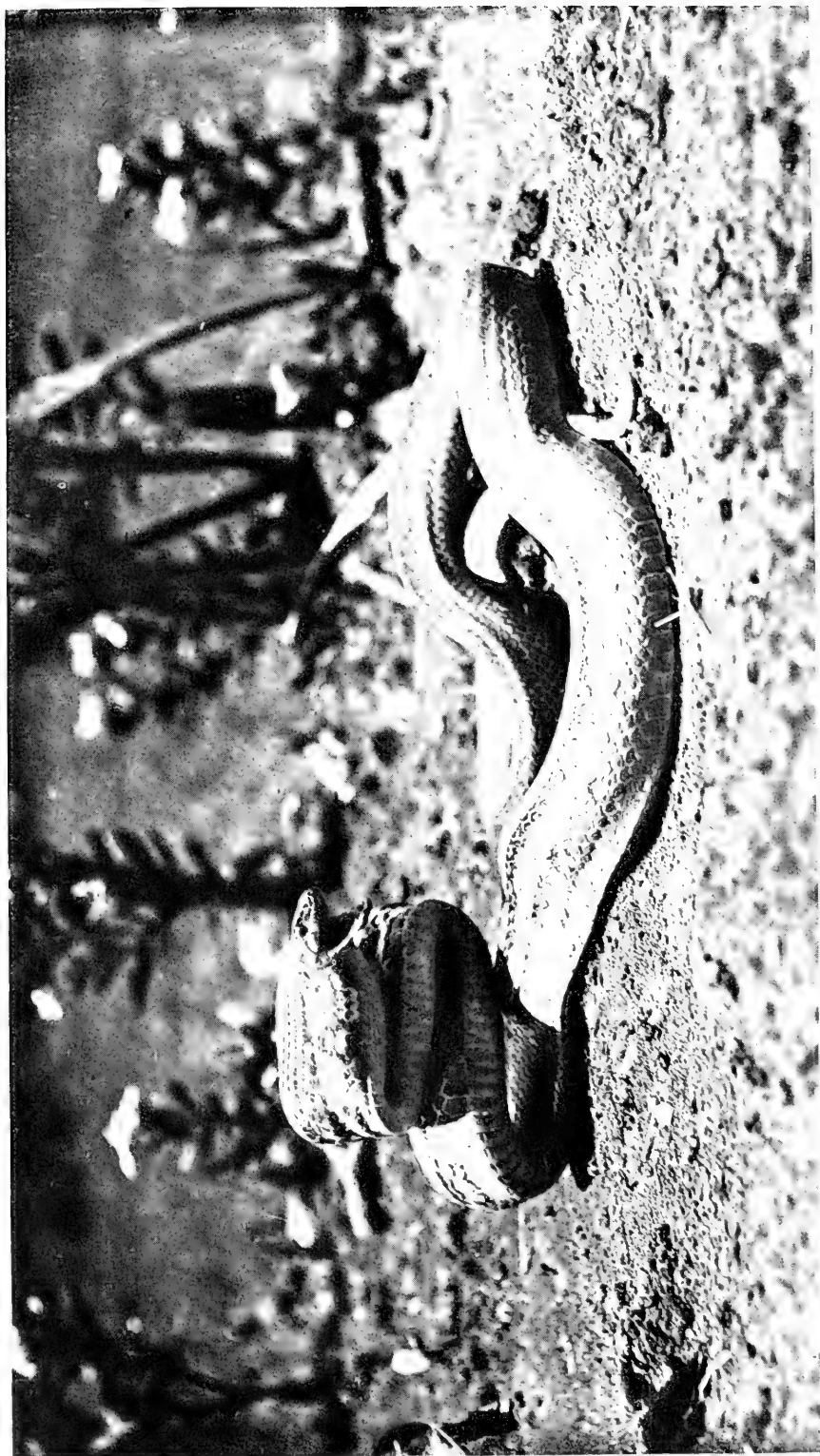
Color (in life). Above, from light or dark olive-brown to olive-green, with well defined but irregular black cross-bars on the posterior half of the body and tail. The young have, in addition, a series of light, dark-edged bars across the anterior part of the body. These disappear with age and after adult life are confined to the interstitial skin. Below, pale yellowish, the posterior ventral and sub-caudal shields edged with black. Labials yellow, edged with black.

Distribution. From India to S. China and the Malay Archipelago.

16. *Zamenis korros.*

Siamese, งูเห่าตาน (ngū hao tān).

It is strange that Flower did not meet with this snake in Bangkok and only records two specimens from the country during his stay. I have found it quite as common as the preceding species, but not so universally distributed, confining itself chiefly to the patches of open brush-wood about the edges of the padi-fields. It has strong arboreal tendencies and is far more often to be seen coiled on a branch in some high bush, than on the ground. At the "Ditches" it is quite common, where it keeps company with *Psammodon condanarus* (already described), and on one particular afternoon, after heavy rain, I caught



Coluber radiatus.

or saw no less than twelve in about an hour. Where these two species live during the dry months I have not yet been able to discover, but they disappear from this haunt after November and do not reappear until the rains have again set in.

Length, 2000 mm. (Boulenger), but I have never seen any specimen from Bangkok of such dimensions. A very large skin in my possession, however, which I think may be undoubtedly referred to this species, was recently killed by Mr. Keddie in the valley of the Meklong. It measured in life, 8 ft. (2440 mm.). The dried skin (of which a considerable portion of the tail is missing) measures 2260 mm.

Color (in life). Above, olive-brown, olive-green or olive-grey, the scales on the posterior part of the body and tail, edged and tipped with black. Below, rich yellow in the anterior part, fading to pale yellowish or whitish behind.

Distribution. From the E. Himalayas to S. China and the Malay Archipelago.

17. *Coluber radiatus*.

Siamese, ๓ ๓ ๓ ๓ ๓ ๓ ๓ ๓ ๓ ๓ (ngu tang maprao).

“Tang maprao,” meaning the mid-rib of the coconut palm leaf, refers to the broad black bands which this snake bears upon its sides. The name, however, is not confined to this species, but may be used to designate any species that has a conspicuous lateral stripe.

It is not a common snake in Bangkok, although it is more plentiful in the country districts outside. It prefers the open country or the plantations and gardens adjacent thereto, although in search of food it will enter human habitations. Its habits and disposition are much like those of the Common Rat Snake.

This snake possesses in a marked degree the power of expanding, in a vertical direction, its throat and the anterior part of its body. The point is well brought out in the photograph, which shows also the menacing attitude adopted by this creature when cornered, with the fore-part of its body thrown into a series of loops and the mouth widely agape, ready to dash at anything. Under these conditions it is extremely handsome, the jet black bars with which it is marked at this part showing up vividly against the pale fawn of the rest of the body. The illustration shown is of a fine specimen which was caught crossing

the road one morning at Samsen. It never grew accustomed to being handled, and the photograph was taken after it had been four months in captivity, when it was nearly as wild and fierce as on the day it was captured. Young ones I have kept were more gentle and soon became tame.

The largest specimen I know of measured 1710 mm. but was incomplete. The tail was 300 mm. long, and the lost tip would probably have added another 30 mm. to it.

Color (in life). Above, yellowish-brown, fawn or fawn-grey, with a distinct reddish tinge posteriorly. Along each side of the fore-part of the body are three black stripes, the upper, broad and conspicuous, the second, half the width and shorter, the third, very thin and much broken up, or occasionally absent altogether. Below, yellowish white in front, pale pearly grey behind. Subcaudals, whitish. A black line across the occiput and three more radiating from the eye.

Distribution. From the E. Himalayas to S. China and the Malay Archipelago.

18. *Dendrophis pictus.* *The Painted Tree Snake.*

A fairly common snake, and widely distributed everywhere, frequenting the open brush-wood in the fields, the betel-nut and fruit gardens, and the compounds in the very heart of the town; loving the sunshine and on the move at all hours of the day. In dull weather it is much less active. It is thoroughly arboreal in its habits, and although it may be seen upon the ground, it is, I believe, only when in search of food. The speed at which it can travel when disturbed is amazing, and is almost lightning-like in its rapidity.

Curiously enough, for a creature of such marked arboreal tendencies, its diet appears to consist entirely of frogs, not only tree-frogs, which are comparatively rare, but the common frogs of the padi-fields. I have never found anything else in the stomachs of specimens I have examined, and those I have kept in captivity lived entirely upon this diet, refusing all other kinds of food. The commonest field frog here is *Rana limnocaris*, and these constitute their main diet, but they are by no means particular. *Oxyglossis lima* they refused, but there must be something very distasteful about this little frog, for I have never known any snake to eat it.

Although the Painted Tree Snake is not vicious or prone to bite in captivity, its shy disposition never seems to leave it, and it always resents being handled. That it has the power of springing or planing from one tree to another, a habit which has given rise to the stories of flying snakes, has been well established.

Length. 1200 mm., the tail forming from $\frac{1}{3}$ to $\frac{1}{2}$ of the total measurement.

Color (in life). Above, bronze-brown. A creamy yellow stripe runs down each flank to the vent, bordered below by a black one of equal width which passes along the costo-ventral junction, and usually by a narrower one above in its posterior two-thirds. Below pearly white. Head with a black band passing through the eye on to the neck. Upper labials white. Tongue pinkish. The interstitial skin of this snake is very handsome, and shows up strongly when the creature, under excitement, dilates its body. Upon the neck and anterior part of the body it is pale blue, behind, pale green.

Distribution. From India to Indo-China and the Malay Archipelago.

19. *Siamese cyclurus.*

Siamese. งูเห่าปี่แก้ว (ngu hao pi kaa-o.)

A fairly common and widely distributed species. It is nocturnal in its habits, but may be found by day hiding itself away in dark nooks and crannies in all sorts of situations.

This snake is credited by the Siamese with giving utterance to that peculiar, high-pitched, drawn-out whistling note, which is heard so frequently by Bangkok residents after dark. Its Siamese title of "pi kaa-o", meaning literally "a crystal flute", is given to it in recognition of this call, and is very appropriate. I have kept no records, but believe it can be heard during any month in the year, although it is most frequent during the hot, dry weather. I have often endeavoured to discover the author of this sound, but have so far been unsuccessful, although I have strong reasons for thinking it is some kind of bat. Mr. Gairdner, on the other hand, tells me he feels sure it is a species of cricket. The point upon which we both agree is that it is not caused by this snake, or indeed any snake at all, although the idea that it is so is widely believed throughout the country.

Simotes cyclurus is a sluggish snake, and if encountered, as it may be, in the early morning or at dusk, will often make no attempt to move out of the way. In disposition, however, it is fierce and vicious, and captivity does not improve its temper.

Length. 700 mm. (Boulenger, *Fauna Malay Peninsula*, and *Cat. Snakes, Brit. Museum*). I have seen many specimens longer than this, the biggest one measuring 865 mm. The largest I know of from Bangkok measured 790 mm.

Color. Very variable, but the changes in Bangkok specimens are largely due to age, the markings in old ones being very indistinct and often broken up. The *Catalogue* gives six varieties of this snake, none of which quite accord with the one that is found here.

Above, light brown, with a series of narrow, ill-defined, black cross-bars, every fourth one of which has a large dark brown, black-edged dorsal spot or blotch, of which there are from 11-16 on the body and 3-4 on the tail. The coloring of the cross-bars is confined chiefly to the edges of the scales, and the dorsal spots are variable in shape, but are usually mesially indented. Below, pearly white, uniform. Head with markings as in the illustration. Sometimes a handsome pink color tinges the flanks and belly.

This description applies to Bangkok specimens only, and although variations from it will be met with in other parts of the country, it will be found sufficient to identify the snake all over Siam.

Distribution. From E. India and S. China to the Malay Archipelago.

20. *Simotes tæniatus*.

Siamese. งู เติน (ngu ngort).

Quite as common as the preceding and found in similar situations. It is less aggressive in disposition. By the Siamese it is accounted particularly venomous, but apart from its lack of poison apparatus, its small size renders it incapable of inflicting anything more than a scratch. It feeds chiefly upon small frogs.

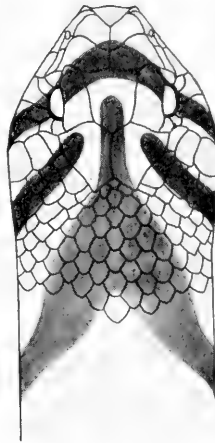
Color (in life). Above, light brown with 4 dark brown longitudinal lines running down the body. The two median, border the vertebral row of scales and are continued to the tip of the tail, the two lateral, end at the vent. These lines are more or less strongly punctuated with black dots; in the young more so than in the



Zamenis mucosus.



Herpeton tentaculatum.



Head of *Simotes cyclurus*, showing the characteristic Family markings.

adult. Below, bright coral-red upon a white ground, and with rectangular black spots laterally placed. They are most thickly distributed on the posterior part of the body, but vary considerably in number and may be almost entirely absent. Head with the characteristic family markings, but differing slightly from *S. cyclurus* (*vide* illustration). Interstitial skin over the vertebral region, light yellow.

Length. The largest specimen I have seen measured 475 mm. in length, the tail forming 60 mm. This, however, is an unusual length, and specimens over 400 mm. are rare.

Another distinct form of this snake exists in Bangkok, to which Mr. Boulenger has now accorded the title of *Mouhoti*, in memory of the famous French naturalist and traveller who discovered it. It is most easily distinguished from the preceding one by the presence of two black splotches upon the tail above, one at the base and another near the tip. For the full differential diagnosis of these two, the reader is referred to page 70 of this *Journal*.

Distribution. Siam and Indo-China.

Subfamily HOMALOPSINÆ.—The Fresh-water Snakes.

Siamese, งูปลา (ngu pla).

Bangkok, as might be expected from its low-lying position, is rich in fresh-water snakes. Out of some 15 species now known from this region (Burma and Indo-China to the Malay Peninsula), no less than 9 have been found here. They are not all strictly confined to fresh water localities, some of them being found along the sea coast, although never far from the mouths of rivers. Fresh-water snakes (the term is used as opposed to sea-snakes) in Bangkok are mostly in evidence at the end of the rains and during the early floods of the dry weather. The whole country at this time being more or less covered with water, they are able to make their way into the multitude of small ponds and ditches from which at other times of the year they are cut off. During the dry months they retire to the river and main canals and are much less often met with. The majority are of a sluggish disposition and are easily caught. On land their movements are clumsy. As far as is known at present, all of them are viviparous.

21. *Hypsirhina enhydris*,

A common snake in Bangkok, and with the exception of *Homalopsis buccata*, the most plentiful of the whole family found here. It may be met with in almost any of the water-ways which intersect the country, usually lying quietly among the weeds, with its snout projecting from the surface of the water. It is not strictly aquatic, and after stormy nights, in particular, may often be seen on land. It is never, however, found far from water. It is a very gentle snake, and I have never yet known one attempt to bite when handled.

It appears to subsist chiefly on fish, but Mr. Herbert informs me that he once caught one which disgorged a skink (*Mabuia*), a very unusual meal, I should think, for this snake.

Length. 680 mm.

Color (in life). Above, olive-brown, olive-grey or olive-green, with two or three more or less distinct light longitudinal bands. The last 3 rows of costal scales are alternately lemon-yellow, pale pinkish, and again yellow. Below, pale yellowish, with a black line along each side of the ventrals, and usually a thin median one, formed by a series of dots. The handsome coloring of the last 3 costal rows of scales is, I believe, peculiar to Siam, and, sometimes, Burma.

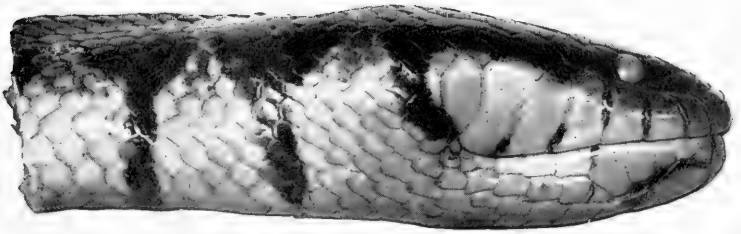
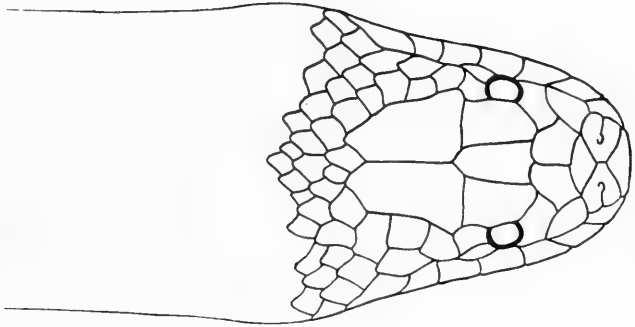
Distribution. From India and S. China to the Malay Archipelago.

22. *Hypsirhina bocourti*.

A rare snake in Bangkok, but more plentiful in the country districts round about. In the fields by Ayuthia and also at Ban Hua Takhé, it is not uncommon, and as the country and the canals dry up with the advance of the hot weather, and its places of habitat become limited, it can almost invariably be met with.

Like *H. enhydris* it is not strictly aquatic in its habits. Its temper is uncertain, and it is not a snake to handle carelessly, although if lifted quietly it will usually make no attempt to bite. Those I have kept fed freely upon frogs.

This snake, for its length, has great girth, particularly in adult life, while the sinister expression upon its face, together with the thick, bloated appearance of its body, combine to make it the most ungraceful and repulsive looking snake that I know of.



Hypsirhina bocourti, natural size.

Length. Up to 1120 mm. The tail is short, measuring about one-seventh of the total length.

Color (in life). Above, very dark olive-green, sometimes almost black, with regular cross-bars formed by chains of yellow or brown spots, and less well-defined longitudinal lines produced by a median spot in each scale. The dark ground-color tapers on the sides into a series of transverse bars, which are prolonged to the mid-line on the belly, but are continuous beneath the tail. The notches thus formed are deep yellow in color, the ventrals, pale yellowish or whitish. Head brown, labials and chin-shields yellow, the scales edged with black.

This description applies to the young and young adults, but as age advances the dorsal bars and lines tend to increase in size and obscure the ground color, so that in old specimens the pattern is seldom apparent.

The drawing of the head is by Mr. C. L. Groundwater, to whom I am also indebted for all the other drawings in connection with this article.

Distribution. Siam, Indo-China and the Malay Peninsula.

23. *Hypsirhina jagorii*,

Flower, in his list, mentions three specimens of this snake which he obtained in Bangkok.

Distribution. Siam and Indo-China.

24. *Hypsirhina smithii*.

This snake, of which only one specimen has so far been obtained, is described for the first time on page 69 of this *Journal*.

25. *Hypsirhina chinensis*.

Boulenger, in his *Catalogue of Snakes*, mentions a specimen from Bangkok which is in the Christiania Museum.

Distribution. Siam, Indo-China and China.

26. *Homalopsis buccata*.

The commonest of all the family of fresh water snakes in Bangkok, and as regards length, the largest. It is frequently met with

by those working in the saw-mills, owing to its fondness for sheltering in the large holes that are found in the interior of teak logs. Here, where it can lie undisturbed, half-submerged, and in almost complete darkness, it no doubt finds an ideal retreat during the hours of daylight. In captivity it quickly becomes tame. Its food consists of frogs and fish. Flower credits it with more intelligence than most snakes and writes that the ones he kept could distinguish him from strangers. A female in my possession recently gave birth (Aug. 7th) to 9 young ones. They were extremely lively and strongly resented my handling them. They were born in the water and were thoroughly at home in it, but the mother sought the land as soon as her operations were completed.

Length. The largest specimen I have seen was a female, which measured 1310 mm., the tail forming 275 mm. Length of the young just born, taken from the above brood, 325-360 mm.

Color (in life). Above, dark brown or plum-colored, the color ending abruptly on the sides, and with pale, yellowish, dark-edged cross-bars, alternately complete and incomplete. Sides yellow, fading to pale yellowish or white upon the ventrals, which have a series of black dots, placed laterally. Under surface of tail thickly covered with black. Head brown, with ill-defined markings, the most pronounced being a pale wing-shaped mark on the occiput, a dark V on the snout and a dark band passing backwards from in front of the eye.

In the young the ground color above is quite black, and the markings are white and clearly defined. In the old ones they become indistinct and may be almost absent, so that the dorsum presents an almost uniform brown color.

Distribution. From Burma and Indo-China to the Malay Archipelago.

27. *Cerberus rhynchops.*

I know of a single specimen which was caught at Samrae. It is an inhabitant of river mouths and the adjoining sea coasts. I have also examined specimens from the sea coast at Bangtaphan and from the Inland Sea at Singgora. I do not know of any other records of this snake from Siam.

Distribution. From India and Indo-China to the Malay Archipelago.

28. *Hipistes hydrinus*.

Boulenger's *Catalogue of Snakes* mentions a specimen from Bangkok.

Distribution. Mouths of rivers and coasts of Pegu, Siam and the Malay Peninsula.

29. *Herpeton tentaculatum*. *The Tentacle Snake*.

Siamese, งู กระต้าง (*ngu kra-dāng*).

This curious looking snake, although not common in Bangkok itself, is more numerous in some of the water-ways in the neighbourhood. At Bang-pa-in it is not uncommon, and also at Petriu, and probably many other places, but being strictly aquatic in its habits, is not often met with unless carefully hunted for. The strange antennae-like appendages which protrude from the snout, serve to distinguish it at once from all other snakes. Speaking of these appendages Flower states: "In life the tentacles of the snout are soft, capable of expansion and retraction, and apparently very sensitive; the snake constantly moves them about, as if they performed the function of the antennae of Arthropods.....When the specimen is placed in spirits the tentacles retract and are not so conspicuous as in life."

I am unable to agree with this at all, and as Flower was a most careful observer, I cannot help thinking that, as he wrote his article after he had left the country, he must, in this case, have been relying on his memory. I have often kept these snakes in captivity and have paid much attention to the "tentacles," and Major Sprater, who has also kept them, entirely agrees with me.

The rostral appendages (as they are technically termed) of this snake are not soft, but are covered with hard scales akin to those upon the other parts of the body. In the process of sloughing they are thrown off as a complete cast with the rest of the skin. They are not capable of expansion and retraction, although they have a wide range of movement as regards approximation and divergation. When the snake lies beneath the water, they are pointed in a forward direction; with the snout protruding above the surface, a common position for this snake to assume, they are laid flat back on either side against the upper lips. They are seldom moved, but are generally allowed to flop

about in an inert manner, more like useless appendages than organs with any function. They are not sensitive, and may be examined freely without any resentment on the part of their owner. Their use is still unknown. The photograph of the head shows them very well.

I have never known this snake to bite when handled, or make any attempt to escape. It feeds, I believe, entirely upon fish. Its Siamese name, "ngu kradāng", is given to it on account of the stiff, unbending attitude which it assumes when caught. I have been informed by a high authority in the language that the word "kradang" cannot properly be used in this sense; it is, however, the explanation commonly given by the country people, though one would certainly have expected, knowing their aptitude for picking out salient features, that they would have chosen the "tentacles" on this occasion.

Length. 770 mm.

Color (in life). Above, reddish brown, with a dark, irregular, longitudinal stripe on either side of the vertebral line, and a broader lateral one commencing at the nose and passing through the eye. Below, pale yellowish, with very similar stripes, the two median of which border the ventral scales. Anteriorly, some dark dorsal cross-bars, and a series of white, dark-edged, ventral spots.

Distribution. Siam and Indo-China.

(*To be concluded*).



+ A SHORT LIST OF BIRDS FROM THE RAHENG DISTRICT.

BY C. S. BARTON.

The majority of the 57 birds shown in this list are from the Me Taw (မြဲတီ) forest, due east of Raheng Town, but I have included a few from further south and west.

Me Taw is a fair sized forest, drained by the Me Taw creek which rises in the hills between the Me Ping and Toungyin valleys. The altitude varies from 400 feet near the Me Ping to 4,000 feet in the higher hills. There are several types of forest, including evergreen, fir, pure bamboo, ordinary mixed tree jungle, and "paa" or laterite jungle (ပြာပူဒဲ).

I have identified the birds from the *Fauna of British India, Birds*. A great many of the species have already been recorded from Tenasserim and the Thoungyin valley. The numbers in brackets are those of the *Fauna of British India*.

ORDER PASSERES.

+ (4) CORVUS MACRORHYNCHUS.—*The Jungle-Crow*.

This appears to be the ordinary crow at Raheng.

+ (71) GARRULAX DIARDI.—*The Siamese White-crested Laughing-Thrush*.

Very common in Me Taw, always in cool jungle near water.

+ (250) CHLOROPSIS CHLOROCEPHALA.—*The Burmese Chloropsis*.

+ (254) IRENA PUELLA.—*The Fairy Blue-bird*.

+ (264) CRINIGER BURMANICUS.—*The Burmese White-throated Bulbul*.

Shot on April 5th in heavy, cold, damp jungle. The tail and outer webs of the wing feathers were rufous, with a decided orange tinge.

+ (290). OTOCOMPSPA FLAVIVENTRIS.—*The Black-crested Yellow Bulbul*.

Shot on 29th March. Altitude 1,100 feet.

- (327). DICRURUS ATER.—*The Black Drongo or "King Crow."*

Very plentiful everywhere.

† (335). CHIBIA HOTTENTOTA.—*The Hair-crested Drongo.*

Nesting in April in a small exposed nest on an absolutely bare tree. Altitude 1,100 feet. A Khamoo caught this bird off the nest while I was away.

† (340). DISSEMURUS PARADISEUS.—*The Larger Racket-tailed Drongo.*
Common in Me Taw.

† (500). PERICROCOTUS PEREGRINUS.—*The Small Minivet.*

Small flocks were flying about in "paa" jungle in January.

† GRAUCALUS SUMATRENSIS.—*The Sumatran Cuckoo-Shrike.*

This bird agreed closely with *G. dobsoni* (511) but had not the black on the face, though the ashy blue is a shade darker. The birds evidently arrived early in November, as I did not notice them before. They fly about the tops of trees and do not appear to come to the ground.

† (521). ORIOLUS MELANOCEPHALUS.—*The Indian Black-headed Oriole.*

Common.

† (524). EULABES INTERMEDIA.—*The Indian Grackle.*

Very plentiful in Me Taw, where it is a purely forest bird.

† (546). GRACULIPICA NIGRICOLLIS.—*The Black-necked Myna.*

Common around Raheng.

(549). ACRIDOTHERES TRISTIS.—*The Common Myna.*

† (553). AETHIOPSAR GRANDIS.—*The Siamese Myna.*

Both the last are very common round Raheng and the neighbouring villages.

† (663). COPSYCHUS SAULARIS.—*The Magpie-Robin.*

Common

† (779). PASSER MONTANUS.—*The Tree-Sparrow.*

The sparrow of Raheng. I did not see *P. domesticus*.

ORDER PICI.

† (951). GECINUS CHLOROLOPHUS.—*The Small Himalayan Yellow-naped Woodpecker.*

† (988). TIGA JAVANENSIS.—*The Common Golden-backed Three-toed Woodpecker.*

ORDER ANISODACTYLI.

† (1023) CORACIAS AFFINIS.—*The Burmese Roller or "Blue Jay."*

ORDER MACROCHIRES.

†(1086). MACROPTERYX CORONATA.—*The Indian Crested Swift.*

Common in "Paṛ" jungle.

†(1090). CAPRIMULGUS MONTICOLA.—*Franklin's Nightjar.*

Great numbers were hawking flies at sunset in November and December.

ORDER TROGONES.

(1101). HARPACTES ERYTHROCEPHALUS.—*The Red-headed Trogon.*

ORDER COCCYGES.

†(1119). COCCYTES COROMANDUS.—*The Red-winged Crested Cuckoo*

†(1120). EUDYNAMIS HONORATA.—*The Indian Koel.*

†(1123). RHOPODYTES TRISTIS.—*The Large Green-billed Malkoha.*
Very common in the jungle, where they skulk about in thick foliage.

†(1124). RHOPODYTES DIARDI.—*Diard's Green-billed Malkoha.*

A much darker bird than Blanford's description leads one to expect. The back and rump were a dark bluish grey with a greenish wash.

†(1130). CENTROPUS SINENSIS.—*The Common Coucal or "Crow-Pheasant."*

Very common all over Me Taw by the banks of the creek.

ORDER PSITTACI.

†(1145). PALAEORNIS FASCIATUS.—*The Red-breasted Paroquet.*

Seems very common in Me Taw. Also kept caged in Raheng.

ORDER ACCIPITRES.

†(1212). SPIZAËTUS LIMNAËTUS.—*The Changeable Hawk-Eagle.*

†(1228). HALIASTUR INDUS.—*The Brahminy Kite.*

Very common everywhere.

†(1251). BAZA LOPHOTES.—*The Black-crested Baza.*

Shot by Mr. J. F. Keddie in Me Taw.

†(1267). MICROHIERAX EUTOLMUS.—*The Red-legged Falconet.*

ORDER COLUMBÆ.

†(1271). CROCOPUS PHOENICOPTERUS.—*The Bengal Green Pigeon.*

†(1273). OSMOTRERON PHAYREI.—*The Ashy-headed Green Pigeon.*

†(1278). OSMOTRERON BICINCTA.—*The Orange-breasted Green Pigeon.*

† (1287). DUCULA GRISEICAPILLA.—*The Grey-headed Imperial Pigeon.*

Large numbers at Me Tah Quaa (แม่ท่าควา) in Me Taw, where they frequent mineral springs.

† (1292). COLUMBA INTERMEDIA.—*The Indian Blue Rock-Pigeon.*

Kept by priests in Rāheng Wats. I have not seen them wild, but they must be found in suitable localities.

ORDER GALLINÆ.

† (1325). PAVO MUTICUS. *The Burmese or Javan Pea-fowl.*

Mr. Keddie has kindly given me the following note on their breeding season in the Me Wong creek (Lat 16°): "On April 9th 1912 found a pea-hen's nest with three eggs, chicks half-formed. On 18th March 1913 heard a pea-hen and chicks on an island. Maung Hpo Loke said he saw them, and they were about a fortnight old; he did not know how many there were, but he saw two".

† (1328). GALLUS FERRUGINEUS.—*The Red Jungle-fowl.*

I found a nest with six eggs in an old stump on the 11th March at an altitude of 2,000 feet. The hen was sitting. The average size was 1.79 in. by 1.31 in. In the *Fauna of British India*, Blanford says they breed in the Himalayas from the end of March to July.

† GENNAEUS SHARPEI.—*Sharpe's Silver Pheasant.*

Identified by the British Museum. This is the common pheasant of these parts.

† (1367). ARBORICOLA BRUNNEIPECTUS.—*The Brown-breasted Hill-Partridge.*

Identified by the British Museum. Plentiful in the Upper Me Taw. This bird, the pheasants, and the Jungle fowl, are largely shot and trapped by Karens.

ORDER HEMIPODII.

† (1382). TURNIX PUGNAX.—*The Bustard-Quail.*

Found in the grass round the 'Nong' at Rāheng. Shot, 25th December.

ORDER GRALLÆ.

† (1401). AMAURORNIS PHOENICURUS.—*The White-breasted Water-hen.*

Common along the banks of Me Taw creek.

ORDER LIMICOLÆ.

+ (1428). METOPIDIUS INDICUS.—*The Bronze-winged Jacana.*

+ (1429). HYDROPHASIANUS CHIRURGUS.—*The Pheasant-tailed Jacana.*

Both these birds were shot by Mr. F. G. Weston Elwes in the Raheng 'Nong', and were identified from Finn's *Indian Waders.*

+ (1432). SARCOGRAMMUS ATRINUCHALIS.—*The Burmese Wattled Lapwing* or "*Did' e do it.*"

Common everywhere.

+ (1462). TOTANUS OCHROPUS.—*The Green Sandpiper.*

+ (1464). TOTANUS CALIDRIS.—*The Redshank.*

Both of these occur in Raheng 'Nong.'

+ (1482). SCOLOPAX RUSTICULA.—*The Woodcock.*

Shot by Mr. Keddie at Raheng and by Mr. Elwes in the Me Wong (Lat. 16°). I also saw them in Me Taw.

+ (1484). GALLINAGO COELESTIS.—*The Fantail Snipe.*

+ (1485). GALLINAGO STENURA.—*The Pintail Snipe.*

This is much commoner than *G. coelestis*. I have not seen a single specimen of Swinhoe's Snipe (*G. megalis*), though I believe they ought to occur in the Me Ping valley.

+ (1488). ROSTRATULA CAPENSIS.—*The Painted Snipe.*

Very common at Raheng.

ORDER ANSERES.

+ (1585). ASARCORNIS SCUTULATUS.—*The White-winged Wood-Duck.*

Shot by Mr. Keddie in Me Wong in March 1912 and identified by The Bombay Natural History Society. I have also seen a large grey duck alighting on the Me Ping river. It would be interesting to know if this is the Spotted-billed Duck (*Anas poecilorhyncha*), or the Chinese Grey Duck (*A. zonorhyncha*), or the Burmese Grey Duck (*A. haringtoni*).

+ (1589). DENDROCYCNA JAVANICA.—*The Whistling Teal.*

On Raheng 'Nong', where I think the Large Whistling Teal (*D. fulva*, 1590) is also found.

+ (1591). NETTOPUS COROMANDELIANUS.—*The Cotton Teal.*

Seen on Me Ping river, and shot on Raheng 'Nong'.

MISCELLANEOUS NOTES.

No. I.—DISTRIBUTION OF CERTAIN ANIMALS IN SIAM.

A REPLY.

Referring to a number of queries which appeared on page 53 of the last *Journal*, I see you ask for information on the following points :—

Bos sondaicus. Eastern limit. They are reported in Annam near the coast between Nah Trang and Phan Rang. I saw three, apparently all bulls, on 5th June 1913, in about E. Long. 107°, N. Lat. 12°—13°, in Cambodia. I also saw a fine head of *B. sondaicus* owned by Mons. Rauffman at Ban Methuot in Annam about 106° E. Long.

It is interesting to note that what may prove to be a variety of *B. sondaicus* has been provisionally named *B. sondaicus porteri* by Lydekker in his "*Ox and its Kindred*." I was with Mr. Porter when he shot the animal. It was very dark coloured and spotted closely with small, pure white spots about $\frac{1}{2}$ inch in diameter, more especially on the neck, and the horns appeared to drop lower on each side of the head than those of the ordinary "tsine." I have since shot a bull with the same characteristics.

The skull and part of the skin of Mr. Porter's animal were sent to the British Museum.

Does *Bos frontalis* exist in Siam? I have not yet seen a head.

Bos bubalus. In Cambodia I saw the tracks of buffalo about E. Long. 105°, and the guides with me stated that these were wild animals.

Bos gaurus. The Comte de Honditot of Phan Rang told me that the Gaur was found in the Annamite mountains.

Cyon rutilans. I have shot three of these in the Meh Woong and one this year (1914) on the right bank of the Meh Khong between Luang Prabang and Pak Lay. I sent the skull and skin of the latter to the Bombay Natural History Society as they had asked for one. The Secretary informed me that it does not differ from the Burmese variety.

Canis aureus. I should like to know if the jackal is found in Siam; and if so, if it has the same distinctive cry as the Indian animal,

with which I am familiar. My brother and I saw an animal in the Klong Suan Mak which we both felt sure was a jackal. However I have never heard the cry of a jackal, which cannot be mistaken, during 15 years residence in Siam.

G. F. WESTON ELWES.

March, 1914.

[There appears to be no doubt that the jackal is widely, although locally, distributed throughout this country. Eds.]

No. II.—SEASONAL OILY SECRETION IN GAUR
OR SELADANG.

On entering a narrow valley in January, 1914, the Karen guide informed me that it was the habitat of a bull Gaur (*Bos gaurus*)—notorious for some 10 years past, and which never ran away but frequently chased man. While on the march I was fortunate enough to meet the animal and shoot him, and he certainly bore out what the Karen had said in not running away, though, possibly owing to the disadvantage of position, he made no attempt to come up the steep bank at us.

The animal had ample warning of my approach, as two coolies, having got ahead of me, dropped their loads and ran back on seeing the great beast standing in the stream and staring up at them. I was followed by some 30 coolies in pretty close order and all were conversing fairly loudly. The 8-bore was brought up from the rear of the line and I went forward to where the men had dropped their loads, but from that point could only get a head shot, so went on some 8 metres and had an easy shot at the flank at 20 metres distance.

The 2 oz. ball, entering high on the right side, passed through the heart and out on the other side, missing all bones I believe, though I did not wait to see the animal cut up.

On being hit he crashed through the elephant grass on the far bank, and died some 20 metres only from the spot at which he had previously stood.

The whole neck and shoulders were covered with an oily secretion, making the black hair of the neck glisten, and the scrotum and inguinal region were dirty orange yellow, and also very greasy.

The whole body skin was greasy, but not markedly so, as were the neck and parts just referred to.

The Karen guide stated this was the period of "mush" ; but I was not previously aware, nor have I anywhere read, that any Bovine has a "mush" period, and should be glad to know whether any members have shot Gaur in this state, and also, whether January is the breeding season. Both the domestic buffalo and cattle of the country breed in March.

Since the skull of this animal is bigger than that recorded by Blanford (*Fauna B. I.*) and the horns are flatter and less curved, and also have a greater tip to tip splay, than any recorded by Rowland Ward (*Records of Big Game, 1907*), it may be of interest to give a full description of this animal, more especially as Lydekker (*Game Animals of India, 1907*), speaks of Burmese and Malayan varieties which differ in some respects from the typical *Bos gaurus* of India.

Height. At the shoulder 174.2 cm. (69 in.)

Length. Nose to root of tail 265 cm. (102 in.); Tail 100 cm. (39 in.); the total length thus being 141 in. against 148 in. recorded by Ward. Girth 277 cm. (109 in.). Other measurements taken were: Frontal ridge to tip of nose 60 cm. (23.6 in.). Ear 32 cm. (13 in.). Knee to tip of hoof 55 cm. Hock to tip of hoof 66 cm.

Colour. Face and cheeks black and thickly covered with short hair, intermixed on the central line beneath lower jaw with hairs up to 2.5 in. long. Poll, frontal ridge and forehead to upper level of eyes, light sandy or dirty white, the hair being upwards of 2 in. in length on the forehead. This colour graded into dark brown and merged with the black below the eyes. There was no band of tawny above the naked muzzle, nor did I notice the long hair on the throat figured by Lydekker for the Burmese variety, or the presence of a dewlap. The lips were fringed with hair of creamy-white, brownish-yellow being intermixed beneath lower lip. The upper inners of ears were fringed with long hairs of dirty white and golden yellow. Remainder of body, thinly haired, very dark brown. Tail black with long reddish-grey hairs intermixed. The legs from above the knees and hocks downwards, greyish-white, the creases behind the joints being reddish-white.

Dimensions of Skull. Basal length 19.3 in. Zygomatic breadth 9.95 in.



Head and Horns of Gaur
(*Bos Gaurus*)

Dimensions of the horns, in inches, together with some others, which I quote for comparison :—

	Widest outside span	Circumference at base	Tip to tip	Widest inside span	Length on curve	Locality
1.	42.95	16.4	38.1	38.8	25.4	Siam N. Lat. 14° 25'.
2.	41.—	20.—	34.5	36.5	27.—	Siam.
3.	31.7	18.5	13.45	24.3	28.3	Siam, Ratburi.
4.	—	17.75	28.5	39.0	29.5	Siam.

No. 1 is the upper one in the illustration, and is the one described in this article. It was obtained within 10 miles of the Tenasserim boundary. No. 3, the lower one illustrated, is in the possession of Dr. Malcolm Smith and was obtained in the same Province of Ratburi though probably south of where I shot No. 1.

Nos. 2 and 4 are the only heads which Rowland Ward records from Siam:—No. 2 in the possession of Mr. J. H. Thurston and No. 4 in that of Mr. A. Waley.

K. G. GAIRDNER.

June, 1914,

No. III.—DISTRIBUTION OF THE “LAMANG” DEER (*CERVUS ELDI PLATYCEROS*.)

In his paper on the Fauna and Flora of Ratburi and Petchburi, which appeared in Vol. I. No. I. of this *Journal*, Mr. K. G. Gairdner writes: “At present two *Cervidae* only are known from this district, the Barking Deer (*Cervulus muntjac*) and the Sambar (*Cervus unicolor*).” To these must be added *Cervus eldi*, known in Siam as the “lamang” and in Burma as the “thamin,” which Mr. Gairdner has apparently not come across in the district referred to. The Siamese variety of this deer is a distinct race, known as *C. eldi platyceros*. It undoubtedly occurs, or was found until recently, in Ratburi Province. On the 29th March 1908, in the neighbourhood of Chawm Bung, a swampy plain having an area of about three square miles, approximate Lat. 13° 40,' Long. 99° 35,' in the Muang of Ratburi, I came across a herd of six, including a fawn. The latter was about the size of a three-quarter grown Barking Deer. It separated at first from the herd, which when first seen was about 200 yards off, and came

galloping back quite close to us, so that my coolies thought of trying to catch it, but it soon made off after its mother, going at a great pace. An hour or two later, we saw what I believed to be the same herd, or part of it, at a distance of about 150 yards. They were then four in number and I did not notice the fawn, so possibly the mother and fawn were resting elsewhere. They were all does. On the 24th February 1907, a few miles north of Nawng Pla Duk station on the Southern Railway, in approximate Lat. $13^{\circ} 55'$ Long. $99^{\circ} 55'$ also in Ratburi Muang, I saw a female "lamang."

These deer frequent grassy plains, and at that time considerable areas in the district last mentioned were covered with coarse grass from 6 to 10 feet high, which afforded excellent cover and shade, more especially as there was a fair proportion of trees growing in the grass jungle. I fancy that most of this area has since been brought under cultivation. It was being rapidly settled at that time. The district around Chawm Bung does not seem very suitable for these deer, as it is more or less closely covered with tree-jungle, and the grass in the glades is short and sparse in the dry season. These deer cannot live far from water. In recent years the plain of Chawm Bung itself has been largely brought under cultivation. Formerly it would have furnished an ideal haunt for these deer. There has also been an enormous increase in the number of people who enter this district in the dry season for the purpose of cutting timber. This is taken out in bullock carts and used for building purposes, railway sleepers, fish traps in the gulf, &c. The wood-cutters do a certain amount of game shooting by sitting up over waterholes, and as the "lamang" cannot go long without water, or travel far in the hot season to get it, it seems to me probable that this deer may have been almost, if not quite, exterminated by now on the west side of the Meklawng River by this method of shooting.

I was informed in the present year that, in the district of Choraké Sampan in the Province of Nakawn Chaisi, which is just north of Muang Kanburi, in Ratburi Province, the "lamang" occasionally enter and feed on the rice crops during the wet season.

I have heard it stated that no "lamang" are found west of the Menam Chao Praya. From what I have stated this is evidently not so. Apart from that, these deer were found until recent years in patches of high grass-jungle between the railway and the river, north of Lopburi

in Krung Kao Province, approximate Lat. $14^{\circ}55'$, where I saw them on more than one occasion in the year 1906. Since then some of this jungle has been brought under cultivation, possibly all of it. I was told that, in the dry season of the year 1906, a "lamang" stag, impelled by thirst, actually ran down in the day time into the water in a railway borrow pit close to Ban Mi station and market, on the railway above Lopburi, and was mobbed by the local people and killed by knives and sticks. I see no reason why "lamang" should not be found on the west of the Menam Chao Praya in this latitude, as I believe there is country on that side suitable for their existence.

A. J. IRWIN.

Bangkok,
15th July, 1914.

No. IV.—NOTE ON TWO RARE MAMMALS, BERDMORE'S
RAT (*HAPALOMYS LONGICAUDATUS*) AND
FEA'S MUNTJAC (*CERVULUS FEÆ*).

Hapalomys longicaudatus. Berdmore's Rat. In January when clearing bamboo jungle to form a camp, a specimen of this rat was paralyzed by a blow on the back, and drowned in spirit in order to preserve all vermin. Dr. Rankin took it home, and Mr. Oldfield Thomas has identified the rat as *H. longicaudatus*, previously only known by specimens from Burma and Tavoy. This rat may be known by the flat nail on the hallux, which appears to be partly opposable, and by the teeth which, to quote Blanford, "differ all from other *Muridae* in having the tubercles of the anterior lower molar triserially arranged."

The dimensions of the living specimen were: Length 6.4 in. Tail 8.4 in. Hind foot 1 in. Ear from orifice 55 in. Vibrissae black, 1.5 in. long.

The fur was dense and soft, of a warm brown colour, lighter on nose and cheeks and with blackish hairs intermixed on forehead and back. Tail, thinly haired with white at the tip. All lower surfaces white from chin to vent. Feet, dirty pink. Found in uninhabited bamboo and teak jungle on the Quaa Noi river, N. Lat. $14^{\circ}22'$.

Cervulus feae. Fea's Muntjac. My coolies when searching for food came across the dead body of a deer which they did not recognize. The deer had been killed by a leopard while drinking in the Menam Lor, a tributary of the Quaa Noi, and at that point about 4 miles from Kow Pra on the Tenasserim boundary in N. Lat. $14^{\circ} 23'$. On that day I also was searching for food, and returned to camp in the late evening to find that the hungry men, having found the deer, had eaten all of it and had roasted the head and mashed it up. The horns, similar to those of a Barking Deer, had been turned into knife handles, and the skin had been twisted up into pack ropes. All that I recovered of this rare deer was a piece of the skin with the tail attached; and this, taken in conjunction with the horns and locality, I consider places the question of identification beyond doubt. So far as I know, this is the second specimen so far recorded, the first having been obtained many years ago in Tenasserim.

Colour. The hair of the back, dark brown, each hair either tipped or annulated with golden yellow. A few white hairs intermixed, and these also are tipped golden yellow. Tail, pure white, with a narrow black line down the centre. Length of tail in dried skin (probably stretched) 6 in. and the white hairs project for 1.3 in. beyond this.

The Karen guide informed me that this was the "ee-kung" and that it took place of the "ee-keng" or Barking Deer in the evergreen jungle, and that the call of the two species was similar.

K. G. GAIRDNER.

June, 1914.

No. V.—NOTE ON LANGUR MONKEYS.

On pages 33 and 36 of Vol. I. No. 1 of the *Journal*, I referred to two species of *Semnopithecus* (now *Presbytis*) which I was unable to identify.

I have now heard from the British Museum authorities that the species described on p. 33 as "black in colour, with poll and tail french-grey, and with bare rings around the eyes of a pinkish white colour", is *Presbytis obscurus*. This species extends down the Malay Peninsula, the northern limit in Siam apparently being N. Lat. $13^{\circ} 20'$.

On p. 36 I referred to another species as occurring North of Lat. 13° 20', which was grizzled black in colour, with long silvery grey whiskers. This has been identified as *P. germaini*. This species was first described from Cochin China, though Flower in 1900 recorded it from Siam.

Of this species two adults measured :—

Nose to root of tail	Tail	Hind leg, anus to foot	Foot with middle toe	Arm	Hand
20 in.	29 in.	12 in.	6 in.	10 in.	3.5 in.
19.5 in.	30.5 in.	13.5 in.	6 in.	11 in.	4.5 in.

In both sexes the bare skin of face, hands and feet is black; the inguinal region, in the male, is dark brown. Two females had a conspicuous white streak running from the anus down the inside of either thigh for 2 in., this mark being wanting in all males examined. Callosities, dirty yellow. Body skin, dirty light ash. Colour of the body hair, dark grizzled grey running to black on uppers of hands and feet and extremity of tail. Whiskers, silvery grey up to 2½ in. long and almost concealing the ears. Specimens obtained during January and February had the tail hair short and bristly, while specimens obtained in July, had the tail much more thickly haired. Two males obtained in July weighed each 19 lbs. and the chest circumference was 19.5 in. The mating season is, I believe, July or August.

It appears to be only locally distributed in Ratburi and only in the low country; but will probably be found common in Eastern Siam.

K. G. GAIRDNER.

June 1914.

No. VI.—LARGE HORNS OF MALAY SAMBAR (*CERVUS UNICOLOR EQUINUS*).

The accompanying illustration shows the head of a Sambar in the possession of Mr. R. A. Moore.

The horns are probably a record for Siam, and are longer than any recorded by Rowland Ward for the species, though a specimen is now recorded from Burma (vide *Bombay Nat. Hist. Soc. Journal*, Vol. XXI p. 248,) with a length of 38 in. and girth of 10 in.

The horns shown are particularly heavy and measure :—

Left 33.6 in. Right 33.5 in. to outer bases of coronets.

„ 33.5 in. „ 34.6 in. to front bases of coronets.

Circumferences. Above coronet 9 in. ; above brow tine 7 in. ; four and a half inches below the bifurcation 7.2 in. and two inches above the same 5.5 in. Length of brow tine 10.7 in.

This head was obtained near Nakon Lampang, 65 miles S. E. of Chiengmai, by Mr. G. K. Spittel.

K. G. GAIRDNER.

June, 1914.

† No. VII.—OCCURRENCE OF THE INDIAN THREE-TOED KINGFISHER (*CEYX TRIDACTYLA*) IN BANGKOK.

Ceyx tridactyla. 1040. *Fauna British India*. A fully adult specimen of this rare little kingfisher was caught by some boys in a garden near Bush Lane on April 7th, and brought to me alive. When the boys saw it, they mistook it for a young bird of another genus which also has a red back, and gave chase ; the bird was evidently very frightened, as it flew into the trunk of a tree and was picked up stunned. I let it loose in the aviary, where it fed on small prawns and was apparently doing very well, but two months later it was killed in a heavy rain storm. It is a bird of very feeble flight, and its small wings, with such tiny quills, strike one as very inadequate to maintain its balance with such a large beak and an extremely short tail. The colours are remarkable for the violet gloss on the hind neck and rump, with purplish blue on the back and wings and bright orange on the breast ; the bill and feet are red. Blanford, in the *Fauna of British India*, describes this bird as found all over India, but far from common, and rare in Ceylon and parts of Southern India. As far as I know, the only other specimen recorded from Siam is the one which was preserved in spirit by Mr. P. A. R. Barron at Koh Si Chang and mentioned by Count Gyldenstolpe.

E. G. HERBERT.

July, 1914.

† No. VIII.—NOTE ON THE RED-BREASTED PAROQUET (*PALAEORNIS FASCIATUS*).

Palaeornis fasciatus. 1145. *Fauna British India*. This Paroquet has been recorded as very common in the North by



Head of Malay Sambar
(*Cervus unicolor equinus*.)

Count Gyldenstolpe, but he did not find it south of Prae, or near Bangkok.

Mr. Barton writes of it in the same way from Raheng, and Mr. Gairdner reports the same from the Western boundary, but I am not aware that it has been recorded from anywhere near Bangkok. On the 20th June last, I found this bird in large numbers between the river and Chiengrak Station, and obtained specimens of both male and female. The distinctive mark between these two is the colour of the beak, which is red on the male and black on the female, and I found the Siamese call them by different names. Blanford, in the *Fauna of British India*, after giving the distribution of this bird in India, says it is found throughout the whole of Burma, the Andaman Islands (not the Nicobars), Cambodia, Cochin China, and parts of Southern China, so one would naturally expect to find it throughout the whole of Siam at certain seasons of the year, and this is probably the case.

E. G. HERBERT.

August, 1914.

† No. IX.—SMALL MINIVET (*PERICROCOTUS PEREGRINUS*)
BREEDING IN BANGKOK.

† *Pericrocotus peregrinus*. 500. *Fauna Brit. India*. The occurrence of this pretty bird in Bangkok seems to be little known, though it may be seen in the fruit gardens on the West side of the river, and more frequently on the mangrove trees along the banks of the river at the lower end of the Harbour. The bright scarlet of the breast and rump are very conspicuous as the birds flit around the outer branches of the trees in search of insects. The Siamese name is "Nok si champoo talay"—the pink bird from the sea, and it is said that they migrate South for breeding in the spring, and then return here for the remainder of the year. Whether any of the birds actually do this I cannot say, but many of them certainly breed in Bangkok during April, May and June.

In April, I often saw them in pairs, and occasionally in May, and from early June I several times saw old and young out together, and watched the young being fed by the female. It then appeared fairly conclusive that these birds were breeding here, and after considerable search, and watching the birds, a nest of fully fledged young

was found on June the 11th. Another with well fledged birds was found on the following day. The first nest was on one of the outer branches near the top of a high durian tree. It was built of fine fibre which was stuck on to the upper side of a branch, and then coated with lichen, so that it resembled a knot or excrescence on the branch. It was a flat cup-shaped nest measuring $3\frac{1}{4}$ in. diameter outside, by $\frac{3}{4}$ in. deep, and it was only with the greatest difficulty that it could be made out, even with glasses. The other nest was stuck on to the leaf-stem of a high betel palm, and was almost as difficult to see. In both cases the nests were only found by watching the parent birds carrying food to the young, and it would be practically impossible to find a nest without watching the birds either building or feeding the young.

E. G. HERBERT.

August, 1914.

No. X—OCCURRENCE OF THE *CHINESE FRANCOLIN*
 † (*FRANCOLINUS CHINENSIS*) IN BANGKOK.

In the Preliminary List of the Birds of Bangkok by Mr. W.J.F. Williamson, published in Vol. I No. 1, of this *Journal*, the number opposite the name Chinese Francolin, is marked with an asterisk to indicate that no specimens have been obtained, although the occurrence of the bird is believed to be tolerably certain. I believe the occurrence is quite certain, but I consider that the birds in question have either escaped from captivity, or been freed for the purpose of making merit, or are the offspring of such birds. I do not know that it would be correct to describe birds bred in this way as "of Bangkok," except in a very limited sense. I have had occasion to move about a good deal in Krungtep (Bangkok) Province, both in the wet and dry seasons, and I have never seen any of these birds, or heard of them as indigenous or likely to be found. They are birds of the higher dry lands, preferably with some bush-jungle about for cover, and there I have found them, but such country does not exist in Bangkok Province. Several years ago I was in the northern part of the Province, in Klawng Rangsit district, where the land had not yet been taken up for cultivation, and was covered with grass jungle. There, if anywhere—the jungle being more or less undisturbed—one would have expected to hear of them, but I never either saw or heard them. Some

years ago one of these birds took up its abode in the N. E. corner of the compound of what was the Survey school (now the Civil Service College) at Sapatum, when I lived there. It was there for some three months at least in the wet season, and never moved from the same position within a radius, say, of 60 yards. I believe it kept on the high banks of the roadside and boundary cuttings. I never saw it, but it called so constantly, presumably in the search for a mate, that attention could not fail to be attracted to it. The call is unmistakable, being a flat somewhat hoarse crow, like that of an ordinary domestic cock with a cold in its throat, and may be nearly rendered by the syllables *Kāk*, *Kāk-Kāk*, *Kā-Kāk*. These birds are often kept in captivity in cages in Bangkok, and I never had any doubt that this was one which had escaped. Its call attracted the attention of passers-by on the public road, and more than once I had to warn off persons with guns who entered the compound in pursuit of it. Possibly one of them got it in the end, for after a time its call was heard no more. I see no reason why these birds should not be able to live in patches of grass or bush-jungle on raised ground near Bangkok. I understand they have been found in one or two such spots. There is hardly any such ground in Bangkok or neighbourhood which has not been artificially raised. The generality of the country about is low-lying, and is more or less flooded during the rains, and is thus quite unsuited to these birds and dissimilar to their ordinary habitat. I should say that, even if they bred to some extent, they would be liable, on account of the damp, to disease similar to grouse disease in England, and would soon die out.

A. J. IRWIN.

Bangkok, 15th July, 1914.

[As the Chinese Francolin is a Siamese bird, and is admittedly found at large in the environs of Bangkok, it is, we think, properly included in Mr. Williamson's list, though Mr. Irwin's explanation of its presence here may be correct. Eds.]

▷ No. XI.—SOME INTERESTING BIRDS FOUND NEAR THE WESTERN BOUNDARY.

The following notes on birds, shot on my recent trip from Raheng down the Me Klong river, may be of interest to members

of the Society. I am indebted to Mr. Herbert for assisting me to identify my specimens.

Cissa chinensis (F. 14). The Green Magpie. Shot March 20th at Huey Nam Ron on the Upper Thoungyin watershed, in bamboo jungle. It is the only one I saw, and I do not recollect having seen one elsewhere.

Oates, in the *Fauna of British India*, writes as follows:—
 “The plumage of this bird changes after death and also in captivity from green to dull blue; and the red on the wings also undergoes a change under the same circumstances, becoming much duller.”
 In the case of the present specimen the crown is distinctly blue over the yellow of the under webs instead of green, the back and scapulars are tipped with blue, and the central tail feathers are blue. Unfortunately I was not aware of this change of colour after death, and did not note the colours when the bird was shot, but it is to be hoped that anyone who obtains a specimen in the future will take very careful note of all the green parts immediately the bird is killed. A description of this bird, taken from the *Fauna of British India*, is given for the guidance of those interested. “Head and neck greenish yellow; general body plumage green; the lores and a band through each eye, the two meeting behind on the nape, black; the cheeks, sides of neck, and lower plumage paler green; tail green, the central feathers tipped with white, the others tipped with white and with a subterminal band of black; lesser wing coverts green, the other coverts red; wings brown on the inner webs, red on the outer ones. Bill red; legs coral red; inside of mouth reddish flesh-colour.”

Urocissa occipitalis (F. 12). The Red-billed Blue Magpie. About a week later I obtained a specimen of this bird, which is very handsome with the purplish blue of its back, wings and tail showing up from a ground-work of black and white. This species has, however, been recorded from other parts of Siam, and a closer description here is unnecessary.

Cyanops davisoni (F. 1013). Davison's Blue-throated Barbet. On April 20th, at a place about eight miles south-west of Pak Me Chan, I saw two of these birds sitting on a low stunted tree in open country, and shot one of them. Later on I saw several more, but did not obtain another specimen.

In Hume's *Nests and Eggs of Indian Birds*, this Barbet is described as common in the Thoungyin Valley, and in the *Fauna of British India* as found in Tenasserim only, so the area in which it occurs appears to be very restricted. The distinctive mark is the verditer blue band across the vertex, instead of black as in *C. asiatica*, with the forehead and rest of the crown crimson.

I also obtained specimens of *Baza lophotes* (F. 1251), the Black-crested Baza; *Terpsiphone affinis* (F. 599), the Burmese Paradise Flycatcher, and saw Peacock-Pheasants, Silver Pheasants, Francolin, Partridges, Jungle-Fowl and Bustard Quail at various places on the route.

Mr. Gairdner, I am told, obtained specimens of *Cissa chinensis* and *Cyanops davisoni* in 1912 from near the Tenasserim boundary. There appears to be a little doubt as to what the note of *Cyanops davisoni* is, and it will be interesting to know whether the monotonous trisyllabic note, so well known by those who have camped near the Tenasserim boundary, belongs to this bird.

J. F. KEDDIE.

July, 1914.

NO. XII.—OCCURRENCE OF THE KRAIT (*BUNGARUS CANDIDUS*) AND THE SMALL-SPOTTED CORAL SNAKE (*CALLOPHIS MACULICEPS*) IN SIAM. A NEW COLOR VARIETY OF THE LATTER.

I mentioned in the last number of the *Journal* (p. 7), that certain species of poisonous snakes, would, on account of their known distribution, be no doubt ultimately found in Siam. Two of that list have since been shown to exist here.

Bungarus candidus. I am indebted to Mrs. Collins for this snake, caught in one of the bungalows at Sriracha. Male. Total length, 850 mm., tail 100. Ventrals 220. Subcaudals 47. Color. Twenty broad white bands upon the body and seven upon the tail, each one with a fair amount of black mottling occupying the middle two-fourths. Tail below mottled with grey. The stomach contained an earth snake (*Typhlops braminus*).

Callophis maculiceps. I have examined no less than 8 specimens from various parts of Siam, as the appended list will show, so

that it would appear to be not uncommon and widely distributed, at any rate in Central Siam. This species is known to extend into Burma and Indo-China and southwards into the Malay Peninsula. In the latter region it is extremely rare (Boulenger), whilst in Burma it is uncommon (Wall).

	Locality.	Total length in mm.	Tail.	Costals throughout.	Ventrals.	Subcaud.	
1.	Koh Si Chang	263	23	13	180	24	4 infralabials touch anterior chin-shields. Tail below thickly spotted with black.
2.	Sriracha	325	35	„	187	30	5 infralabials touch anterior chin-shields.
3.	„	288	23	„	186	23	Tail immaculate below, except for the usual bands.
4.	Pak Jong	465	35	„	198	21	Alt. 800 ft. R. side, 8 upper labials, due to division of 3rd. 5 infralabials touch anterior chin-shields on R. side, 4 on L. side. Had eaten an earth snake <i>Typhlops nigroalbus</i> .
5.	Kanburi	213	18	„	181	22	5 infralabials touch anterior chin-shields. Tail thickly spotted below.
6.	Lopburi	285	25	„	189	22	4 infralabials touch anterior chin-shields.
7.	Nong Kai Ploi	260	25	„	173	25	5 infralabials touch anterior chin-shields.
8.	Paknampo	220	20	„	175	24	R. side 6 upper labials, due to fusion of 6 and 7. 5 infralabials touch anterior chin-shields.

Nos. 1—5 have the usual series of small black dots down the back and do not differ from the recognized description, except that they have in addition a very faint, dark, vertebral line.

Nos. 7—8 constitute a new color variety, similar to the var. *uni-virgatus* of the allied *Callophis maclellandi* (Maclelland's Coral Snake).

Color. Above, light yellowish-brown, without dorsal spots, but with a conspicuous black vertebral line running the whole length of the body and tail, as well as the usual tail bands. Head and neck black, with a pale yellowish line along each upper lip, interrupted below the eye. Belly coral pink. Tail below, more or less thickly spotted with black.

No. 6 is intermediate between the two forms. The usual dorsal dots are present as well as the conspicuous vertebral line.

Mr. Boulenger (*Cat. Snakes, and Fauna Malay Pen.*) gives the number of ventrals shields as varying from 205-247. The difference in the number in the Siamese specimens is noteworthy.

Major Wall (*Poison. Terrest. Sn. Brit. Ind.*) in his supplementary characters of identification says:—Anterior sublinguals touch 4 infra-labials. The difference in the Siamese specimens will again be noted.

Typhlops nigroalbus found in the stomach of No. 4 has not yet been recorded from Siam, although I have seen specimens from other parts of the country.

I am indebted to Mr. Boulenger for identifying this species.

MALCOLM SMITH.

July, 1914.

No. XIII.—SLUGGISHNESS OF A PYTHON.

While working on a hilltop of some 250 metres elevation recently, the coolies discovered a python curled up in a small cavity formed by big, loose boulders. The cavity was too small for a man to enter and since the gall bladder was required to make medicine, they finally decided to build a fire of glowing embers in the cavity and roast him out. The snake, however, preferred to roast rather than face his enemies, who were waiting round the entrance with boulders and axes. After some half hour's time he was so stupefied with smoke that a noose was cast over his head and he was ignominiously hauled out—offering little resistance.

It was found that the body was burnt in several places and the skin blistered. The python measured just over 4 metres and was

as thick as a man's thigh, though it did not appear to have fed recently.

K. G. GAIRDNER.

March, 1914.

[From the description of this snake given us by Mr. Gairdner, it was no doubt *Python reticulatus*. Eds.]

No. XIV.—ON THE BREEDING HABITS OF *HYPsirrhina*
ENHYDRIS AND *HERPETON TENTACULATUM*
(THE TENTACLE SNAKE).

Hypsirrhina enhydris. The following observations confirm and supplement what is already known about the breeding habits of this species.

I obtained a female in the month of December showing enlarged ovarian follicles, in which the embryos, 10 in number, could be just discerned. I received another gravid female in April, containing 18 young ones, their development in this case being well advanced. The mother was a very large specimen measuring 680 mm. in length. A third was caught in July, which gave birth to a single still-born young one, probably the last of her brood. The other records, quoted by Major Wall in his article on this snake in the *Journal of the Bombay Natural History Society*, are as follows:—"Colonel Evans came across a pair *in copula* in Lower Burma on October 16th. * * * * Another was taken by Theobald near Rangoon in a gravid condition in March."

By piecing all this evidence together, it would appear, therefore, that intercourse takes place at the end of the rainy season, about October, and that the young are born when the rains have again set in, about June or July.

The single young one, referred to above, measured 180 mm. in length, and resembled the parent in every way except that, as is usually the case, the coloration and markings were more vivid.

Herpeton tentaculatum. In the *Catalogue of Snakes in the British Museum*, the number of scales across mid-body in this snake is given as 37. An examination of a number of specimens has shown me that this is not always the case, but that they may vary from 35 to 39. I have recently been able to examine a brood of 13 young ones, which shows this variation very fully. Unfortunately they did not come to

maturity, owing to the death of the mother. This happened in June, and judging from the state of their development, they would not, I think, have been born for some weeks. They were quite white, but in every way perfectly formed, including the "tentacles." The genital organs of all the males were extruded, rendering the differentiation of sex an easy matter. In the process of examination, some of them were allowed to become dry so that a count at that point could not be made.

Length of the mother, 770 mm.

The costals are counted two heads' lengths behind the head, at mid-body and two heads' lengths before the vent.

MOTHER. COSTALS, 37. 39. 35. VENTRALS, 122.					
MALES.			FEMALES.		
	Costals.	Ventrals.		Costals.	Ventrals.
1.	34. 35. 33.	107	10.	34. 37. 33.	114
2.	36. 37. 35.	122	11.	36. 38. 35.	—
3.	33. 36. 36.	118	12.	— 37. —	—
4.	34. 35. 33.	—	13.	34. 37. 33.	116
5.	33. 36. —	122			
6.	34. 37. —	103			
7.	— 37. —	—			
8.	34. 35. 33.	112			
9.	33. 35. 33.	112			

From the above list it will be seen that the number of scales in this species is by no means regular, and in this particular it resembles the true sea-snakes. The ventral shields also are extremely small, being not more than twice the breadth of the adjacent costals. They are sometimes missing entirely, and anteriorly are indistinguishable from the costals, making a true count difficult.

MALCOLM SMITH.

July, 1914.

No. XV.—NOTE ON A RARE LIZARD, (*LYGOSOMA*
ISODACTYLUM.)

During the past year I have received or collected nine specimens of this rare lizard, previously known only from a single one

discovered by M. Mouhot in Cambodia during his travels in 1858-60.

The first two were caught in the stone quarries at Sanam Cheng (N. of Lopburi) but were so badly preserved as to be useless. A third was sent me by Mr. Greene, the station-master at Lopburi, having been caught in the station, and two more were shortly afterwards dug up in a garden at Sam Kok. In July, at Chong Kae, I caught four specimens alive, having found them beneath the stacks of fire-wood in the station yard. I kept them for some time, until one night a horde of ants invaded their cage and devoured them.

These lizards, as might be expected from the rudimentary condition of their limbs, are chiefly subterranean in their habits. They move about with a sinuous snake-like action, the fore-legs being in frequent use, the hind ones not at all, but pressed closely back along the sides of the body. In pushing their way about through small cracks and crevices and in burrowing in the earth, the fore-limbs also remain idle, and the creature becomes entirely snake-like in its movements. They can, however, be extremely active, and elude capture with great agility.

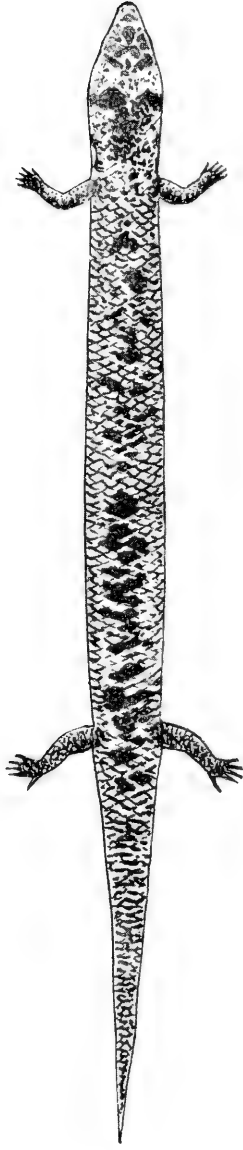
In lepidosis my specimens differed in no way from the type description, except in the number of scales round the body. This is given in the *Catalogue of Lizards in the British Museum* as 30. In mine they varied from 30 to 34.

Their color also varied slightly and was (in life) as follows:—Above, dark yellowish, thickly powdered with very dark brown, this color often confluent and forming patches. In one of them these patches were so extensive as to practically obscure the ground color. Sides, with a dark edge to each scale, forming oblique lines upwards and backwards. Below, pale yellow or yellowish white, speckled irregularly with brown. In the only half-grown specimen I obtained the belly was of a uniform pale yellowish color. Labials, 1st excepted, barred with yellow and brown alternately.

The drawing, by Mrs. Stephen Groves, is from a specimen in which the tail had been reproduced. This appendage, therefore, is not shown in its full length. Normally it is nearly the length of the head and body.

MALCOLM SMITH.

May, 1914.



Lygosoma isodactylum, natural size.

PROCEEDINGS OF GENERAL MEETINGS.

1st ORDINARY GENERAL MEETING, 1914.

This was held at the Oriental Hotel on the 6th March, at which 24 members were present—the President, Mr. W. J. F. Williamson, being in the chair. The meeting was attended by Count Nils Gyldenstolpe, an Honorary Member of the Society.

The accounts for the year 1913, showing a balance of Tcs. 213.55 in hand, were presented and approved.

The election of officers for the year 1914 resulted as follows:—President, Mr. W. J. F. Williamson; Vice-President, Dr. Malcolm Smith; Hon. Secretary and Treasurer, Mr. S. H. Cole; together with Major W. Sprater, Mr. E. G. Herbert and Mr. E. J. Godfrey, Members of Committee.

As the result of a discussion on the subject of the annual subscription, initiated by Mr. W. G. Weeks, it was agreed, on the proposition of Dr. Malcolm Smith, that the amount of the annual subscription be reduced to Tcs. 20 with effect from the current year.

An exhibition of specimens was made by Members.

Mr. K. G. Gáirdner exhibited the skin, head, horns and tail of a Sladang (*Bos gaurus*).

Messrs. W. J. F. Williamson and E. G. Herbert showed the nests, eggs and skins of the Black-necked Myna (*Graculipica nigricollis*), the Java Fantail-Flycatcher (*Rhipidura javanica*), the Burmese Yellow-breasted Sunbird (*Arachnechthra flammixillaris*) and the Brown-throated Sunbird (*Anthothreptes malaccensis*).

Dr. Malcolm Smith showed the following snakes:—*Callophis maculiceps* and *Dendrophis subocularis*, neither of which had been previously recorded from Siam.

Mr. E. J. Godfrey exhibited some specimens of butterflies and moths.

The first number of the *Journal* was distributed to members at this meeting.

2nd ORDINARY GENERAL MEETING, 1914.

This meeting was held at the Oriental Hotel on the 16th June—Mr. W. J. F. Williamson, the President, being in the chair, and 16 members and 2 guests attending.

The business of the meeting was an exhibition of mammals, birds and reptiles recently collected on the Tenasserim boundary.

Mr. K. G. Gairdner showed the mammals and birds collected by himself—amongst the former being the tail and a piece of the adjacent skin of the rare Fea's Muntjac (*Cervulus feae*). The birds, of which a fair number had been obtained, included the following which, so far as is known, have not previously been recorded from Siam:—Black-throated Laughing Thrush (*Dryonastes chinensis*); Dusky Broadbill (*Corydon sumatranus*); Red-bearded Bee-eater (*Nyctiornis amictus*); a Frogmouth (*Batrachostomus sp.*) and a specimen of the rare Rufous-bellied Hawk-Eagle (*Lophotriorchis kieneri*).

Dr. Malcolm Smith exhibited specimens of the reptiles obtained by his collector. The total number of species which had been brought in was 31, amongst which were *Coluber oxycephalus*, *Alabes scriptus*, *Simotes violaceus*, *Tropidonotus chrysargus*, *Polyodontophis collaris*, *Acanthosaura crucigera*, *Calotes cristatellus*, *Draco blanfordi*, *Gymnodactylus marmoratus*, *Lygosoma olivaceum*, *L. vittigerum*, *Bufo asper* and *Rana macrodon*, none of which had been previously recorded in Siam north of the Isthmus of Kra.

Dr. Smith also showed a second specimen of a skink (*Lygosoma anquinoides*) and of a snake (*Simotes inornatus*) both of which were new to Science and which would be described by Mr. Boulenger in the forthcoming number of the *Journal*.

ELECTION OF MEMBERS.

The following members have been elected since the 1st January, 1914:—

Honorary Members. H. R. H. Prince Chumpon; Count Nils Gyldenstolpe.

Members. C. J. Aagaard; W. Bain; E. B. Boyce; T. B. Chatteris; Mrs. D. J. Collins; J. E. Dalgleish; S. W. Eyton; H. Gardner; W. L. Grut; J. F. Keddie; S. C. Keynes; R. H. Nisbet; A. W. Ogilvie; A. Osann; A. A. Porter; A. L. Queripel; G. Rexhausen; G. C. Smyth; Mom Luang Thong; F. Zabel,



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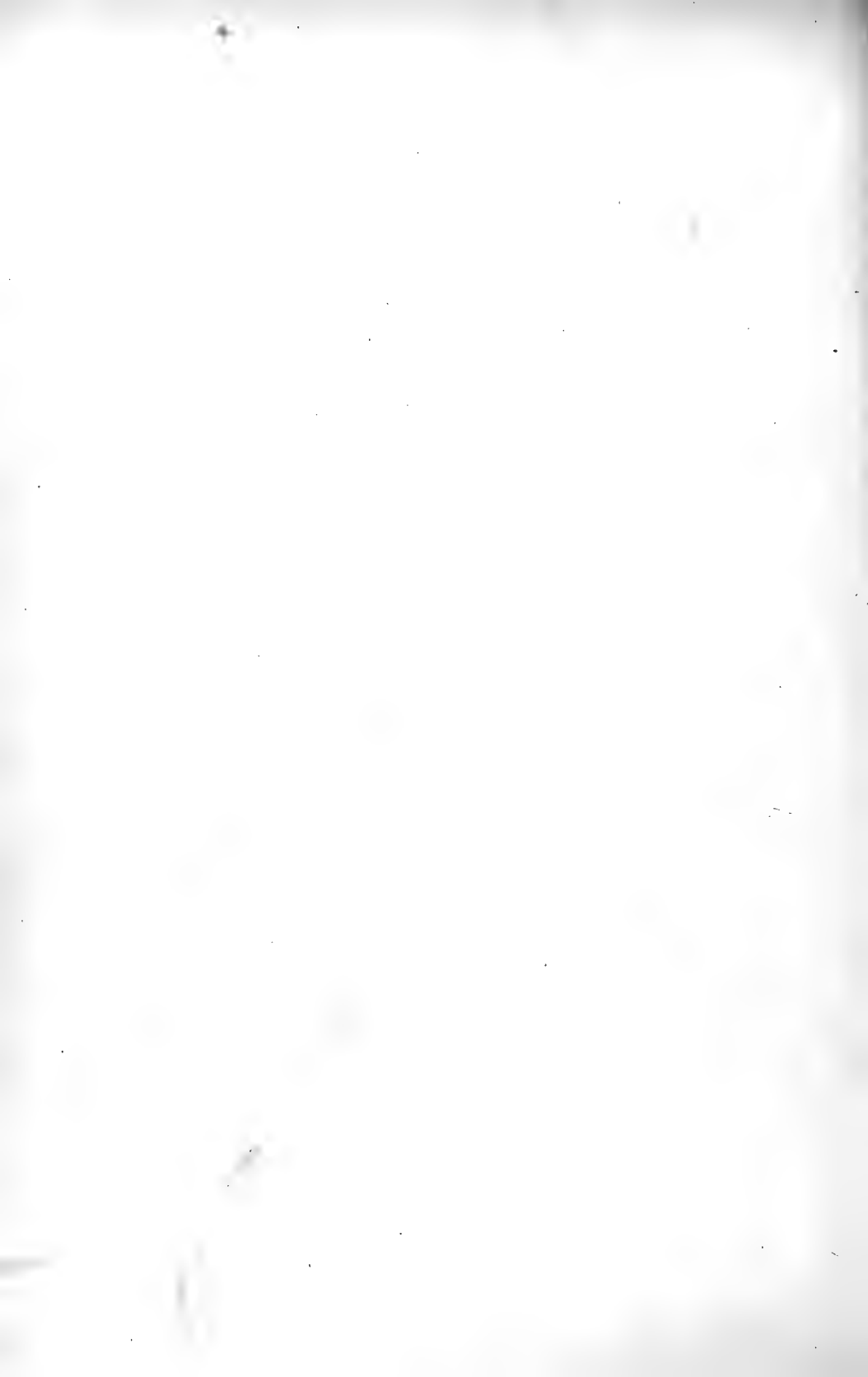
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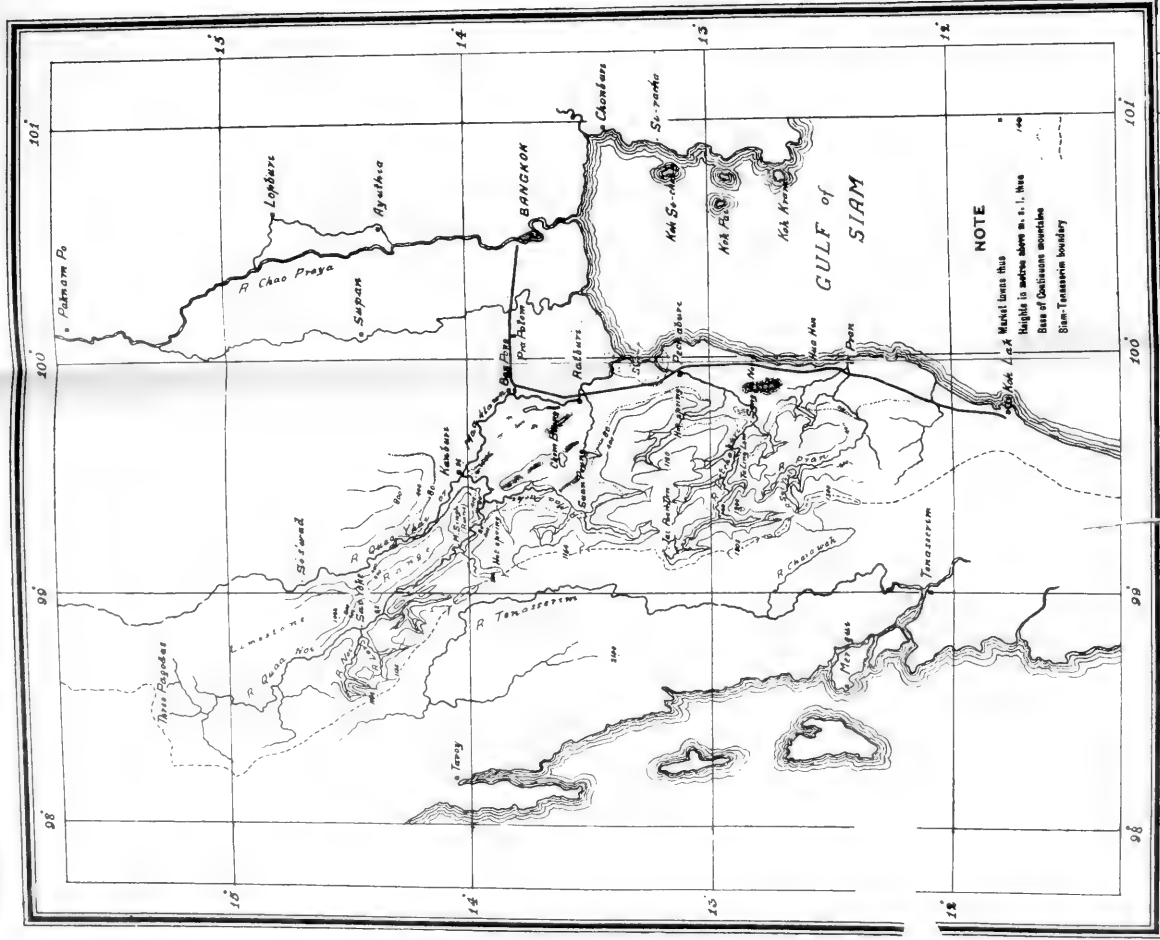
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สมุดแผนที่สยาม

Sketch Map to illustrate the Paper on the Fauna and Flora of Ratburi and Petchaburi

by K. G. Gairdner Scale 1 : 2,000,000



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✦ NOTES ON THE FAUNA AND FLORA
OF RATBURI AND PETCHABURI DISTRICTS.

(Continued)

—◆◆◆—
BY K. G. GAIRDNER.
—

MOUNTAINS ENTIRELY CLAD IN EVERGREEN FOREST.

Oates in his preface to "The Birds of British Burmah" speaks of the interior of Tennasserim bordering on Siam as being "almost impracticable to a European." The Petchaburi hinterland was, until four years ago, practically unknown both to Siamese and Europeans, being deservedly unpopular both on account of its inaccessibility and the deadly nature of the malaria only too easily contracted in the dark chasm-like valleys.

The boundary, or watershed is, however, probably more easily approached from the Tennasserim side than from the Siamese, owing to the fact of the Tennasserim river flowing due South parallel to the boundary for some 140 miles, and distant from it only some 7 to 15 miles. This river is, I believe, navigable by "dug outs" for the greater part of its length.

Expeditions in wild mountain country, practically uninhabited, are entirely dependent on coolie labour for the transport of goods and necessaries, and since a healthy Lao coolie consumes 35 to 40 lbs of rice per month (or the equivalent of one man's heavy load in such

country) it appears that trips of more than two weeks duration necessitate a considerable force engaged in bringing up supplies from a base.

As no description of this part of the country, so far as I am aware, has ever been given, it may be of interest if I shortly describe it.

The Petchaburi river, as it trickles beneath the bridge at the town of Petchaburi in the dry season, is an insignificant looking stream, and gives little indication of the fact that its course is upwards of 80 miles in length, draining an area of 1200 square miles, 600 of which are mountains of considerable elevation in the direct line of the S. W. monsoon.

The source of this river is in N. Lat. $12^{\circ} 40'$ E. Long. $99^{\circ} 20'$, this point being the birthplace of two other big streams:—the Huey Sat Yai (Big Beast river) which flows East into the Pran river, and the Cha-ra-wah flowing West into the Tennasserim river. From its source the Petchaburi river flows due North for 20 miles to the Elephant's Tusk rapid, where it is joined by the Menam Bang Kloï, which latter has its source some 17 miles to the N. W. The ground level at the junction is 145 metres above sea level and the boundary is distant westwards some 10 miles or four days' march.

The Elephant's Tusk is an impassable rapid for dug outs,—the banks being precipitous there is no opportunity, as at other bad rapids, of dragging the canoes through overgrown shallows at the sides of the main stream.

From this point the river flows some 18 miles due East when the first Kariang hamlet is reached, viz:—Ta Ling Lom (Wind monkey landing) and a further 12 miles E. S. E. carries one to Sarahett. Here the river makes a sharp bend and flows due N. E. to Petchaburi town.

The northern portion of this area is drained by the Meh Pachee river which rises with the Bang Kloï in N. Lat. $13^{\circ} 10'$ and flows due North some 50 miles where it joins the Quaa Noi.

The area to the south of the Petchaburi watershed is drained by the Pran river, the source of which lies some 10 miles N. E. of the source of the Petchaburi river and about 10 miles on the Eastern or Siamese side of the boundary range.

All these three rivers for the first 20 miles of their courses lie in deep gorges, together with their hundreds of tributaries. Only occasionally do small flats occur in the bottoms, and these are seldom of any extent. The greatest altitude found was 1505 metres (5000 ft.)

on the boundary in N. Lat $12^{\circ} 54'$, and as a rule in that district the boundary is over 1100 metres in height, rarely falling below 800 metres. There is an entire absence of plateau-like or undulating ground, the mountains being steep sided, and the ridges or summits, seldom more than 10 to 30 metres in breadth, falling away on either side to the valleys at slopes varying from 25 to 60 degrees. Generally speaking the summits of ranges or ridges are from 300 to 500 metres higher than the valleys directly beneath them.

There is, thus, very little deep humus or water holding soil, the greater part of the rainfall finding its way immediately to the rivers, and accounting for the sudden floods to which these streams are subject, it being no uncommon occurrence for the Petchaburi river in the rainy season to rise 20 feet in 12 hours, and 30 feet has been known in the same period. The formation is granite with a few small and isolated limestone outcrops.

With the exception of *H. odorata*, which is mainly confined to the banks of running streams, and a species of *Salix* growing both on the banks and in the shallows, the jungle is very varied, but the greater portion is dark and gloomy—the undergrowth varying in intensity according as the overhead foliage is light or heavy. Once off the main game tracks it is usually necessary to cut one's way when ascending to mountain tops for work. As previously stated, the ridges slope away sharply on either side of the crest, but no view is obtainable until extensive clearing has been done. In the same way in the valleys, if one required sunlight in camp to dry clothes or dry up the land leeches, it was always necessary to spend some hours felling the timber and jungle, and then frequently, owing to the depth of the ravine, it was only possible to obtain 3 or 4 hours sunshine.

The Karangs make a few paths in the vicinity of their houses and clearings, but otherwise the only paths available are those made by the wild elephants. These cross and recross the streams every 50 or 100 yards but are otherwise frequently quite good. A few main tracks were found leading over the less steep ranges—paths used by the elephants during the rains when in search of bamboo shoots, and leading over dividing ranges from one valley to another.

I propose to describe a couple of trips in that country which will indicate its nature away from the main stream.

On the 15th March 1912 I left my headquarters camp with 20 coolies and, crossing a low ridge, slept that night at a big rock pool in the Huey Ma Rew, a favourite haunt of langurs, and attracted by the excrement of these, or some other cause, numberless flies kept up a humming as of swarms of bees till nightfall and started again at dawn. In the previous year a herd of sladang haunted this pool for some months : and on one occasion while we were improving the game track to make it serviceable for mail transport, a sladang waited at the side of the path watching me till I approached within 10 yards. The first intimation I had of its presence was when, whirling round, it dashed up the hillside. At other times I have found them lying down during the heat of the day on the more open knolls of a hillside, and on such occasions they go crashing down to the valleys before one gets near them ; and the fact of this beast waiting is probably attributable to the haphazard and "doing nothing in particular" manner of my approach.

Following the stream to its source, the path ascends steeply and crosses the rather flat watershed between the Ma Rew and Maa La Liang valleys at an elevation of some 450 metres. I found the bed of a small dry stream crossing the path to be much encrusted with a deposit of lime several inches in thickness, and more especially of course where the water had trickled down small declivities. In the previous year I saw on this path a large family of the big muscular Stump-tailed Macacques—never found outside the evergreen jungle and usually at some elevation. In 1911 I obtained a young one dropped by his mother in her flight, and this I kept till it died of sun-stroke during the present year.

Continuing along the well defined game track, the path descends at an easy slope to the Huey Maa La Liang. This stream has its source at the base of a mountain range surmounted by a grass covered peak some 1250 metres in height, and is the only mountain within a radius of ten miles with a name to it (Kao Pa Nern Toong). In the previous year the valley was inhabited by a Karang and his family, but in April the wife and daughter fell ill with cholera, and the husband fled leaving them to die and their bodies to dry in the sun. In cases of cholera and small pox, Kariangs and Karangs immediately flee, forming new settlements elsewhere, but I believe as a rule bury their dead. In 1912, small pox broke out in my headquarters camp, and

some few Kariangs did temporarily quit their homes near by, but a Government official arriving, tied new 5 cent pieces round the necks of all and sundry and so averted disaster.

Following the game track, we were attracted by the smell of some dead beast, and found, some 10 yards from the path, a black leopard lying flat on its back with its neck or its back apparently broken. The ground at that point was flat and covered with very tall trees, the nearest branches being not less than 80 feet from the ground. It appeared to me that the leopard had been chasing langurs in the branches overhead and, missing its footing, fell from a great height and was killed. There was no wound on the body apparently, though I did not long pursue investigations on account of the stench,

Though shut in by mountains on all sides this valley is more open than most, and contains a good deal of secondary growth.

The Grey Peacock-pheasant (*Polyplectron thibetatum*) was exceptionally common, and the call when heard from a great height above the valley resembles that of a hoarse goat. Near at hand it is "qua-qua-qua," repeated with lessening intervals until the bird apparently becomes apoplectic and can only screech. I have been told by trustworthy men that the Peacock-pheasant is the "kaw kaw" bird, and that on a sudden clap of thunder a captive bird was actually seen uttering this sound. On the crash caused by falling trees or on a clap of thunder, this "kaw kaw" is instantly heard, together with the barking of any langurs within hearing, and I have only heard this "kaw kaw" in jungle inhabited by the Peacock-pheasant. In the higher and darker portions of this valley I first saw the Pittas, and also an Orange-headed Ground-Thrush, snared by the feet. Wood Partridges also were common and were snared by the coolies, who imitate the call with a reed.

At this point I turned South, ascended to about 600 metres and dropped down into the head waters of the Pran river, and following down this, arrived at a Karang settlement of four houses. Here I obtained the Bronze-winged Dove (*Chalcophaps indica*) which is by no means common in Petchaburi though generally distributed, and I have only met them singly, never in small flocks as, according to Oates, they are found in Burmah.

I obtained also the White-breasted Water-hen. The only mammal shot was the big black squirrel (*Ratufa melanopepla*), much more

sluggish than the common squirrel, and which has the habit of lying spread flat on big horizontal branches for some time when observed, with perhaps the end of the tail appearing over the side only.

From here I followed down the Pran valley to the next Karang hamlet, and ascending a range of 600 metres to the South East, crossed over into the Huey Sat Yai, a stream considerably bigger than the parent Pran river.

On the march we found old evidences of rhinoceros, and the cook collected all the dried excrement he could find, the Chinese having great faith in anything connected with the rhinoceros as medicine.

The game track up the Sat Yai is excellent going in the dry season, and the track must have been used without change for generations by pachyderms, judging by the gnarled tree roots and rocks polished and worn smooth occurring in the path. On the 2nd day's journey up this stream, at about nine o'clock, we found ourselves on the brink of a dry gully, which extended in an almost straight line far up the hill side, and showed up clearly against the deep green jungle on either side. A pair of Malay bears were observed feeding and leisurely turning over stones up the gully some 200 yards away. These I stalked and missed, but I came back at 6 p.m. when another bear appeared in the same spot, and this I also missed, misjudging the distance in the failing light. The Malay bear was frequently observed in that valley and took little heed of the coolies going to and fro for rice and supplies.

Two days later, continuing the march upstream, the fresh tracks of rhinoceros were found. I have not yet seen one, but from the fact of native hunters recognizing the "raadt" or one-horned species and the "kra-soo" with two horns, it is almost certain that both *R. sondaicus* and *R. sumatrensis* exist in that area. I have found their tracks up to and above 4000 feet. In 1911, a female with young attacked a Survey party in the Yang Choom valley, and savagely bit a coolie in the arm.

It was found necessary to camp on a ridge of some 1200 metres on the boundary, water being brought up daily by the coolies from the valley 700 metres below. The trees at that elevation are entirely clothed with mosses, tree ferns and orchids, and many of the outer trees are stunted, there being no high ranges on the Tenasserim side at that point to lessen the force of the S. W. monsoon.

+ The Grey-headed Imperial Pigeon (*Carpophaga griseicapilla*) was obtained here. The call is a peculiarly deep "er-woob-woom" and I have

only heard it at elevations of 1000 metres or more. A Davison's Barbet † (*Cyanops davisoni*) was obtained with three young, in a hole at the top of a dead stump. All the barbets are bad sleepers, and throughout the night in jungle country, whether camping in valley or mountain top, one hears their monotonous call.

At this high elevation a brilliantly coloured snake was found, possibly *Doliophis bivirgatus*. The snake, some 4 feet long, was azure-blue covered with small white spots, the whole head and last 6 inches of the tail being a brilliant red, glistening as though painted with enamel. In July my coolies met and described to me a similar snake, found at some 800 metres elevation.

Working on this 1200 metre ridge, two species of Horse Fly (*Tabanus rubidus* and *T. striatus*) were very troublesome, in addition to hundreds and thousands of thirsty bees of five different sizes which, during the hot season, are always attracted to freshly felled spots, and hinder one's work by entering eyes, ears, and nose, swarming on the hands and exploring up one's sleeves in their search for moisture. Frequently they become so bad as to necessitate smoke fires. Fortunately only two of the larger species of bee sting. The largest, with a buff band round the body, constructs big half-circular nests beneath the horizontal limbs of a smooth backed species of *Ficus*, or beneath an overhanging rock on a cliff face. This species is widely distributed and I saw a nest in course of making beneath an arch at the Colombo Museum.

While on the subject of thirsty insects, it may be of interest to mention that certain Skipper and Fritillary butterflies have the power of exuding drops of water to moisten surfaces on which they wish to feed, and I think this must be a peculiarity of tropical butterflies, as I certainly never noticed or heard of it in Europe. On one occasion a Skipper exuded five drops of water within the space of two minutes on the back of my hand, dabbling his trunk in the drop between his hind legs until finished, when he repeated the process. The drops were of large size and the five together would apparently equal the bulk of the insect's body. I have seen them do the same thing on a chair or table in camp.

When ascending to this camp on the 28th March, we experienced torrential rain, and on the 31st the camp was enveloped in cloud. Descending on the 1st April, we found the rains and floods had brought

out the land leeches, and the coolies, who are as a rule rather leisurely on the march, fairly raced through the valleys, halting only on rocks in mid-stream to pull or scrape the leeches off. Later in the season the coolies became more expert, and on the march carried a stick apiece, to the end of which they tied on a tiny bag containing tobacco, pounded chilies, and red lime. This dabbed on a leech had the effect of instantly shrivelling it up. From observation I think these worms are very sensitive to, and hunt or are attracted by, vibration, making no use of their rudimentary eye spots. Keeping quite still, and with ten or more leeches in sight standing erect, slowly waving their heads about, I stamped my foot, when they would all advance towards me, but would then stop in doubt, unless the stamp were repeated. The young appear in May or June and are a great nuisance in July, being then only the size of needles, and can get through lace holes in boots and crevices in putties with ease.

The camp in the valley was some 400 metres above sea level, shut in on all sides by mountains of 1200 to 1300 metres elevation, and two hours after arrival in camp the Huey Sat Yai rose some five feet and became quite impassable. I obtained here a Rail which I believe to be *Rallina superciliaris*, and which seemed to me quite out of place in dense forest, nor have I met the bird elsewhere.

On the return journey heavy rain fell on the 4th April. On the 5th my dogs picked up the scent of a tiger off the shrubs and bushes bordering on the path, and, as the scent got hotter, off the path itself; this was 9 a.m. and it became apparent that the tiger was going down for a morning drink at a rock pool just ahead. I crawled round the last bend hoping to see the beast drinking, but found two Karangs having breakfast there, and they informed me that on sight of them the beast had bolted up the hillside. Tigers have recently been giving some trouble in the coast districts of Ratburi, but I do not know of any authentic case of molestation by tigers among the hundreds of coolies who have been employed by the Survey Department in the wild parts of Ratburi. They have taken an inquisitive interest in our doings and eaten our transport mules; and on one occasion a tiger walked all round and between a party of four coolies sleeping out on a sand bank, but they knew nothing of its presence till morning.

On the 15th April I left headquarters camp for a trip to the head waters of the Bang Kloï river, and on the 3rd day out arrived

at a surveyor's camp situated in a deep gorge at the head of the Hue Maa Pradohn. The surveyor had a live larder containing peacock-pheasants and hill partridges. He had also the skin of a very rare cat, *Prionodon maculosus* (the Burmese Linsang), which had been trapped after several raids on the penned birds. The skin was subsequently lost in the floods. The following night I slept at a Trig. station above the camp, elevation 1150 metres. Heavy rain fell that night, and the following morning the view was exquisite—the whole valley of the Bang Kloi being a sea of white cloud with the higher ridges and peaks showing up as dark green islands. To the East the Gulf of Siam was just visible. Descending Westwards from here was very bad going, and a couple of days were spent in searching the numerous ravines for anything like a human track leading up to the "House at the Heart of the World" (*Ban Chai Paan Din*). We arrived there on the 24th April, very curious to see this solitary Karang household and eager to buy rice, of which the Trig. party had reported there was a large supply. The husband was away, and neither the wife nor a dirty youth (alleged to be an 'angel' with a knowledge of all languages) could speak Siamese. The place certainly surprised me, being situated on a slight spur jutting out from a small flat-topped range of some 800 metres elevation. On a cleared space was a "bawt" or temple, and near it a small "wihan," together with a couple of buildings not usually found in Buddhist places of worship, viz:—to the North of the "bawt" a small rectangular building for the male "chao" or spirit and to the South, one for the female—the latter being some 8 feet square and perched on the top of a 6 feet pole, access being had by a ladder. Around these buildings the ground was perfectly cleared of weeds, and flowering trees and shrubs had been planted and clipped for ornament. From this point a splendid view of the mountain ranges to the East was obtained. The following day the owner, Palloogaw, returned, a tall Karang with a heavy moustache. He could speak a little Siamese, and sold me a quantity of rice and chickens—the only Karang in the whole of Petchaburi who had rice for sale. On my asking him how he had found this spot for his abode, Palloogaw replied that the "chao" had told him of the spot in a dream; but I afterwards found out that he himself was reared at Lum Sai on the Quaa Noi River, and had lived here with his wife for the past 22 years, her parents having migrated from Tennasserim, the boundary being only two miles distant. The

man was apparently his own head priest, and on moonlight nights entered his temple and slowly beat a small drum. My coolies were afraid to trespass near the temple, and when my assistant asked permission to worship there, the old man said he must first anoint him.

The household was unusually large, the parents and eleven children, all alive and sturdy, owing their health presumably to the high elevation, and having been settled there for many years past, the primeval forest had been felled each year in small patches for some distance around. Karang families as a rule are very small, one man this year telling me that his wife had had twenty children, of whom three survived, and they are, too, very improvident, seldom having sufficient rice to last for the whole year. In 1912, the Karangs at the head waters of the Petchaburi, were living on a species of a big potato in July, and would have to subsist on roots and tubers until the rice crop matured in December. Being laid up here for a week with a poisoned foot, I was able to study the "angel" previously referred to. He appeared to be a youth more weakly and therefore more indulged than the others, and could speak neither Siamese nor Burmese, though he was an excellent shot with a cross bow.

Travelling North and crossing the head waters of the Bang Kloi, we crossed the watershed at 1000 metres elevation and followed down the Meh Pachee river, and on the second day arrived at the Karang hamlet nearest to "Chai Paan Din," arriving at Soan Peung on the 3rd day. Here mules were obtained, and when nearing Ratburi on the 6th May a heavy storm burst, lightning striking the parched fields and raising huge clouds of dust. Hail falling in large lumps whitened the ground, and within half an hour the paddy fields were flooded.

I was laid up in Bangkok some three weeks, but left again at the end of May with 74 Lao coolies and 10 Chinese. Of these latter, four succumbed to malaria and privation,—the Chinese appearing to be useless for any kind of pioneer work. Arriving at headquarters camp, I found a number of men down with malaria, so on 9th June started off to complete the Topo. detail survey on the boundary. The water had risen considerably but the dug outs all reached the rice depot at the Elephant's Tusk rapid without mishap on the 12th June.

On the way up we met the Kariang head man from Tah Ling Lom with five others, returning from a fruitless search for Ban Chai

Paan Din, he having received orders to bring in the reported "angel."

With the water rising steadily, the old route for supplies along the bed of the Petchaburi river became impossible, and a new route had to be cut over the mountains. In three days we progressed two miles and regained the East bank of the Petchaburi river again. I ascended two hills here to get the lie of the country and find a possible route to the boundary, and while camped here an emaciated party rafted down in search of food.

We endeavoured to bridge the flooded river by felling trees, but finally had to cross on a pontoon raft of bamboos, hauling it to and fro with giant rattans. Even thus it was a perilous journey, and all valuables had bamboo floats tied to them before being put aboard.

Arrived at the far bank, further path cutting was necessary, and while we were doing this a pair of porcupines ran out of their burrow and, gazing for a second, ran off. The burrow was situated some 100 metres up the hillside, and later on, endeavouring to smoke them out, the half-gnawed lower jaw of a pig was discovered in the burrow. No records were kept of porcupines obtained, but I presume they are of the same species as those obtained at Hua Hin, viz, *Hystrix grotiei*.

Crossing a ridge, we descended into a tributary stream flowing from the West, and ascending this for a day's march, made camp at a spot showing fresh tracks of tapir, and the bed place of one of them was found some 150 metres up the hillside. Tapirs appear to have the habit, in common with the great cats, of scratching up the ground with the hind feet, and frequently deposit their excrement at the bases of trees. They are never, I believe, intentionally shot by jungle folk, who look upon these rather defenceless creatures as peculiar. They allege that the Creator, having devised all other beasts to his entire satisfaction, had left over numerous remnants of clay. Taking these in his hands, he rolled them all up together, exclaiming "p'som-sett".* Hence the tapir, with four toes in front, and three on the hind feet as in the rhinoceros, and in other parts superficially resembling some other animals.

On the return of the coolies sent back to the depot for rice, camp was again shifted up on to a ridge of 900 metres elevation.

* Literally, "the mixing is finished."

Being July, the S. W. Monsoon was at its height and my work was greatly hindered by mist. Heavy rain fell daily, but fortunately the leaves of a broad-leaved palm were available for roofing.

At this time, of my 32 coolies, only 10 were available for work, 12 went to and fro to the "Elephant's Tusk" depot for rice, and one-third were always down with malaria. Of the gang sent back for rice, three men preferred the excitement of rafting down the rapids (on a few bamboo poles strung together) to the drudgery of scrambling along the cut path on the banks, and in consequence were laid up for several weeks with bad wounds. Added to the climatic discomforts was the fact that we were constantly short of rice, owing to the ferry raft breaking away on one trip, when a considerable amount of rice was lost.

On this ridge I met a species of black langur (*Presbytis femoralis*) not previously observed elsewhere.

This species is less robust in form than the other species inhabiting Petchaburi, viz. *P. obscurus*, and was not observed at elevations below 800 metres. The fur is woollier than in other species, and the young appear to be black or dark-coloured in early life. The call, which may be rendered "oo-oo-terruk", is entirely different from that of *P. obscurus* or *germaini*, and it lacks the hoarse bark of these two species. The Northern limit of *P. femoralis* appears to be N. Lat 13° 50', where the boundary range drops to 350 metres elevation and is crossed by a belt of deciduous dry jungle, which would appear to be unsuitable for the species. From here it ranges down to Singapore, though the Malayan type has considerably more white on the belly and underparts than any specimens obtained by me.

The White-handed Gibbon (*Hylobates lar*) was also obtained here, and was found to have a good deal of fat on the shoulders and back, possibly affording it some protection against the awful weather. The hill men (*Karang*s) have also observed that the gibbon is very fat during the rains. The species is most variable, ranging from a dirty straw colour to black, but the hair on hands and feet is invariably white, as also is a ring round the face.

On this ridge was found a very big herd of Stump-tailed Macaques (probably *M. rufescens*), and hearing them before seeing them I thought the sound was that of a pack of wild dogs quarrelling over a carcass. The adults galloped off leaving the youngsters to make their way to the tree tops. Following the game track on top of the

ridge, a solitary boar was bagged, not apparently in the least perturbed by the explosion of the gun in shooting a hornbill only 70 yards away. A flying lemur (*Galeopithecus volans*) was observed clinging to the side of a tree, hanging at the full extent of its fore legs with the tail tucked away out of sight, and certainly not head downwards as reported by Blanford. This specimen was a beautiful soft grey in colour, and when disturbed the parachute was seen to be a dark brown. It floated away to the base of a tree, and flopped up the trunk in a most ungainly way. When hanging on the trunk of a tree it has the appearance of a pear-shaped excrescence, and finding itself observed would imperceptibly slide round the trunk. At 900 metres a monitor (*Varanus nebulosus*) was shot while eating a lizard of the genus *Calotes*, and afforded a pleasant change in a daily diet of dried pig, the flesh having the appearance of fish and a taste resembling chicken.

Work on this ridge being completed, on the 18th July camp was shifted down to the stream, the sick men being pushed and rolled down, and the treatment apparently did them good for none died. Making these men as comfortable as possible and putting the convalescents in charge, the following day I climbed a ridge of 1,000 metres to the North, taking with me 4 days rice, and water for one night. The first day on the ridge was fine and a considerable amount of work was completed, but on the following day, shifting camp again northwards along the ridge, the clouds never lifted for more than three or four minutes at a time, several hours being wasted searching for a Trig. point near which I wished to camp. During the search, an immense solitary boar was shot, standing 33 inches at the shoulder. This beast was very fat and estimated to weigh about 300 lbs. Only one testicle had dropped. The tusks were fair, being about 9 inches in length.

This ridge was broader than usual, and running water was obtained only 50 metres below the summit. During the next twelve days the climatic conditions were not pleasant. The mountains on the Tennasserim side, to the West, being of low elevation, the full force of the monsoon whistled through the trees, driving clouds and mist through the camp, and the tree tops were usually invisible. Mosses and orchis flourished on the firewood, and did not wither till actually licked by the flames. Land leeches paraded about the kitchen, and a small blood-sucking fly left peculiar blood spots beneath the skin on exposed parts of the body. The fly attacked the bare legs of the coolies,

and on scratching, mud or dirt penetrated, poisoning the blood and incapacitating them.

On the day of arrival we found the fresh tracks of elephant, rhinoceros and tapir; but it was surprising to find the black langur (*P. femoralis*) staying on the exposed ridges during such weather, when even the gibbons were silenced, and also numerous small passerine birds including flower-peckers, fantail-flycatchers and babblers. A big flock of hill partridges haunted the camp, and on the 2nd August a green + jay (*Cissa chinensis*) was obtained, one of a party of five. On one occasion when going to the Trig. station, for the daily dreary wait for a break in the clouds, a large herd of pig were observed feeding within 20 yards of the ridge summit, all unconscious of our presence; and so they remained, for the guns had been sent in another direction to secure langur meat.

It may be of interest to mention that wild pigs make nests, and when first I struck one of these I took it to be the nest of some archaic bird, but the coolies recognised it immediately as a pig's nest. Several have been observed, entirely composed of sticks ranging from the size of a finger to an inch in diameter, all having been bitten off from the jungle around the nest. The pile is rather less than 3 metres broad by 1 high, and the pig tunnels beneath the pile. Blanford mentions that in India pigs make nests of grass, but in the evergreen jungle there is little or no grass.

During this year I came across another nest or shelter which puzzled me considerably. At an elevation of 850 metres on the boundary, I found a rough shelter formed of leafy branches, thick end uppermost and supported by a thin clump of small bamboos. The branches appeared to have been arranged methodically, and looking for the mark of a knife, I found that the branches had been bitten and torn off from the tree overhead, which was stripped of its smaller branches, some of which had not fallen to the ground but lay withered in the forks above. A bear's claw marks were visible on the tree, so it is a point for investigation as to whether bears form some sort of shelter during the rains.

On the 13th day of our sojourn in this inhospitable region the clouds lifted for short periods, and on the 4th August the sun broke through for 3 hours, enabling me to complete the work on the boundary. The following day the return journey was commenced in the

pouring rain, the descent to the valley not being easy on the slippery clay, and the flooded stream down which our path lay was barely negotiable. On arrival at the big river, one of a very noisy flock of + Tickell's Hornbill (*Anorrhinus Tickelli*) was obtained, the species apparently having a much wider range than supposed by Oates, who records this bird only from one valley near Moulmein, about 200 miles to the North of this point.

On arrival at Elephant's Tusk depot, I was relieved to find that all other parties had completed and returned to headquarters camp some time previously. The canoe men on rice transport told me that 50% of the bamboo rafts starting from Elephant's Tusk had smashed up in the rapids, and I therefore decided to cut my way out, using the canoes for the sick. The canoe men picked up four starving and raft-wrecked Chinese coolies on the way down, two of whom died after arrival at headquarters camp.

Of the 400 men engaged on the work in the Petchaburi hinterland, 7% died of malaria in the district, and 3% from other causes, cholera, small pox, suicide and drowning; and looking back on the awful difficulties experienced in that country during the monsoon, I am surprised that the percentage was not greater. Of my own coolies none died of malaria, and this I attribute to their having plenty of pig and monkey meat when the rice failed, and to a daily dose of 5 grains of quinine.

LIST OF MAMMALS, BIRDS, REPTILES AND
BATRACHIANS OBTAINED IN THE RATBURI
AND PETCHABURI DISTRICTS.



The nomenclature as in *Fauna of British India* has been followed except in such cases where the British Museum or other authority has reverted to an earlier name or split up species. In such cases the newer name is used, those in the *Fauna* being given in brackets.

Species identified by the authorities of the British Museum are shown in heavy type, thus :—**Hylobates lar**.

Species of which no specimens have been retained or which were only observed are marked with an asterisk.

M A M M A L S .

ORDER PRIMATES.

Hylobates lar. *The White-handed Gibbon.*

MACACUS ARCTOIDES. *The Brown Stump-tailed Macaque.*

M. RUFESCENS. *The Rufous Stump-tailed Macaque.*

Of Nos. 2 and 3 no adult specimens have yet been obtained, and it is impossible to tell whether the young are *arctoides* or *rufescens*. The young of the species obtained by me (I believe *rufescens*) has a very fetid scent, whereas adult captive specimens of what I think are *arctoides* from N. Lat. 10° have no scent.

M. NEMESTRINUS. *The Pig-tailed Macaque.*

M. CYNOMOLOGUS. *The Crab-eating Macaque.*

Presbytis Barbei. *Barbe's Langur.*

P. obscurus. *The Dusky Langur.*

P. Germaini. *Germain's Langur.*

P. femoralis. *The Banded Langur.*

Presbytis is the *Semnopithecus* of Blanford. *P. Germaini* occurs only as an isolated colony west of Ratburi and separates *obscurus* to the South from *Barbei* to the North.

NYCTICEBUS TARDIGRADUS. * *The Slow Loris.*

ORDER CARNIVORA.

- FELIS TIGRIS. * *The Tiger.*
 F. PARDUS. * *The Leopard or Panther.*
 F. TEMMINCKI. * *The Golden Cat.*
 F. VIVERRINA. * *The Fishing Cat.*
F. bengalensis. *The Leopard Cat.*
F. chaus. *The Jungle Cat.*
Viverra zibetha. *The Large Indian Civet.*
 PRIONADON MACULOSUS. * *The Burmese Tiger-Civet.*
Paradoxurus hermaphroditus, *The Malayan Palm-Civet.*
Canis aureus. *The Jackal.*
Cyon rutilans. *The Malay Wild Dog.*
 URSUS TORQUATUS. * *The Himalayan Black Bear.*
 URSUS MALAYANUS. *The Malay or Honey Bear.*

ORDER INSECTIVORA.

- TUPAIA FERRUGINEA. *The Malay Tree Shrew.*
Galeopterus (GALEOPITHECUS) volans. *The Flying Lemur.*

ORDER CHIROPTERA.

- PTEROPUS SP. * (probably EDULIS. *The Flying Fox.*)
 RHINOLOPHUS LUCTUS. *The Great Eastern Horse-shoe Bat.*

ORDER RODENTIA.

- Ratufa melanopepla** (SC. BICOLOR). *The Large Malay Squirrel.*
Sciurus caniceps. *The Golden-backed Squirrel.*
S. atrodorsalis. *The Black-backed Squirrel.*
S. epomophorus.
 S. MACCLELLANDI BARBEL. *The Striped Himalayan Squirrel.*
Hapalomys longicaudatus. *Berdmore's Rat.*
 RHIZOMYS SUMATRENSIS. *The Large Bamboo Rat.*
 RHIZOMYS SP. * (probably BADIUS. *The Bay Bamboo Rat.*)
Hystrix grotei. *The Malay Porcupine.*
 LEPUS SIAMENSIS (PEGUENSIS.) *The Siamese Hare.*

ORDER UNGULATA.

- ELEPHAS MAXIMUS. * *The Indian Elephant.*
 RHINOCEROS SONDAICUS. * *The Small One-horned Rhinoceros.*

RHINOCEROS SUMATRENSIS. * *The Asiatic Two-horned Rhinoceros.*

TAPIRUS INDICUS. * *The Malay Tapir.*

BOS GAURUS. * *The Gaur or Indian Bison.*

B. SONDAICUS. * *The Banting.*

CAPRICORNIS (NEMORHAEDUS) SUMATRENSIS MILNE-EDWARDSI.
The Goat Antelope.

CERVULUS MUNTJAC CURVOSTYLIS. *The Barking Deer.*

CERVULUS FEAE. *The Black Barking Deer.*

CERVUS UNICOLOR EQUINUS. *The Malay Sambar.*

TRAGULUS SP. * (probably JAVANICUS. *The Mouse Deer*).

SUS CRISTATUS. *The Indian Wild Pig.*

EDENTATA.

MANIS SP. * (probably JAVANICA. *The Malay Pangolin*).

BIRDS.

I regret that this list is in no way representative of the avifauna of the Petchaburi—Ratburi district, but my collecting has been done with a 12 bore gun, which is not suitable for small Passerine birds. Other classes I have inexcusably neglected—noticeably the Woodpeckers which abound in this area.

The numbers are those of the *Fauna of British India—Birds*.

ORDER PASSERES.

- +4. CORVUS MACRORHYNCHUS. *The Jungle-Crow.*
- +14. CISSA CHINENSIS. *The Green Magpie.*
- +64. DRYONASTES CHINENSIS. *The Black-throated Laughing-Thrush.*
- +71. GARRULAX DIARDI. *The Siamese White-crested Laughing-Thrush.*
- +118. POMATORHINUS OLIVACEUS. *The Tenasserim Scimitar Babbler.*
- +176. MIXORNIS RUBRICAPILLUS. *The Yellow-breasted Babbler.*
- +250. CHLOROPSIS CHLOROCEPHALA. *The Burmese Chloropsis.*
- +255. MELANOCHLORA SULTANEA. *The Sultan-bird.*
- +290. OTOCOMPSA FLAVIVENTRIS. *The Black-crested Yellow Bulbul.*
- +299. PYCNONOTUS FINLAYSONI. *Finlayson's Stripe-throated Bulbul.*
- +327. DICRURUS ATER. *The Black Drongo.*
- +340. DISSEMURUS PARADISEUS. *The Larger Racket-tailed Drongo.*

- †475. *LANIUS NIGRICEPS*. The Black-headed Shrike.
 †491. *PERICROCOTUS FRATERCULUS*. The Burmese Scarlet Minivet.
 †512. *ARTAMUS FUSCUS*. The Ashy Swallow-Shrike.
 †514. *ORIOLOUS INDICUS*. The Black-naped Oriole.
 †521. *ORIOLOUS MELANOCEPHALUS*. The Indian Black-headed Oriole.
 †524. *EULABES INTERMEDIA*. The Indian Grackle.
 †536. *STURNIA SINENSIS*. The Chinese Myna.
 †546. *GRACULIPICA NIGRICOLLIS*. The Black-necked Myna.
 †549. *ACRIDOTHERES TRISTIS*. The Common Myna.
 †553. *AETHIOPSAR GRANDIS*. The Siamese Myna.
 †556. *STURNOPASTOR SUPERCILIARIS*. The Burmese Pied Myna.
 †575. *CYORNIS RUBECULOIDES*. The Blue-throated Flycatcher.
 †599. *TERSIPHONE AFFINIS*. The Burmese Paradise Flycatcher.
 †601. *HYPOTHYMIS AZUREA*. The Indian Black-naped Flycatcher.
 †606. *RHIPIDURA JAVANICA*. The Java Fantail Flycatcher.
 †663. *COPSYCHUS SAULARIS*. The Magpie-Robin.
 †664. ***Cittocincla macrura***. The Shama.
 †686. *GEOCICHLA CITRINA*. The Orange-headed Ground-Thrush.
 †721. *PLOCEUS MEGARHYNCHUS*. The Eastern Baya.
 †801. *EMBERIZA RUTILA*. The Chestnut Bunting.
 †841. *ANTHUS MACULALUS*. The Indian Tree-Pipit.
 †884. *AETHOPYGA CARA*. The Tenasserim Yellow-backed Sun-bird.
 †912. *DICAЕUM CRUENTATUM*. The Scarlet-backed Flower-pecker.
 †930. *PITTA CYANEA*. The Blue Pitta.
 †931. *PITTA CYANOPTERA*. The Lesser Blue-winged Pitta.
 †935. ***Pitta cucullata***. The Green-breasted Pitta.

ORDER EURYLAEMI.

- †939. *CORYDON SUMATRANUS*. The Dusky Broadbill.
 †940. *CYMBORHYNCHUS MACRORHYNCHUS*. The Black-and-red Broadbill.

ORDER PICI.

- †984. ***Micropternus brachyurus***. The Malay Rutous Woodpecker.

ORDER ZYGODACTYLLI.

- †1009. *THEREICERYX LINEATUS*. The Lineated Barbet.
 †1013. *CYANOPS DAVISONI*. Davison's Blue-throated Barbet.
 †1019. *XANTHOLAEMA HAEMATOCEPHALA*. The Crimson-breasted Barbet.

ORDER ANISODACTYLI.

- †1023. CORACIAS AFFINIS. The Burmese Roller.
 †1027. MEROPS PHILIPPINUS. The Blue-tailed Bee-eater.
 †1032. NYCTIORNIS AMICTUS. The Red-beaded Bee-eater.
 †1033. CERYLE VARIA. The Indian Pied Kingfisher.
 1035. ALCEDO SP. * (probably ISPIDA. The Common Kingfisher).
 †1043. PELARGOPSIS GURIAL. The Brown-headed Stork-billed Kingfisher.
 †1050. CARCINEUTES PULCHELLUS. The Banded Kingfisher.
 †1051. DICHOCEROS BICORNIS. The Great Hornbill.
 †1053. ANTHRACOCEROS ALBIROSTRIS. The Indo-Burmese Pied Hornbill.
 †1055. **Rhytidoceros subruficollis**. Blyth's Wreathed Hornbill.
 †1059. PTILOLAEMUS TICKELLI. Tickell's Hornbill.
 †1067. UPUPA INDICA. The Indian Hoopoe.

ORDER MACROCHIRES.

- †1091. CAPRIMULGUS ASIATICUS. The Common Indian Nightjar.
 †1096. LYNCORNIS CERVINICEPS. The Great Eared Nightjar.
 †1098. **Batrachostomus affinis**. Blyth's Frogmouth.

ORDER TROGONES.

- †1103. HARPACTES ORESCIUS. The Yellow-breasted Trogon.
 †1120. EUDYNAMIS HONORATA. The Indian Koel.
 †1130. CENTROPUS SINENSIS. The Common Coucal or Crow-Pheasant
 †1133. CENTROPUS BENGALENSIS. The Lesser Coucal.

ORDER PSITTACI.

- †1140. PALAEOORNIS ROSA. The Eastern Blossom-headed Paroquet.
 †1145. PALAEOORNIS FASCIATUS. The Red-breasted Paroquet.

ORDER STRIGES.

- †1152. STRIX FLAMMEA. The Barn-Owl or Screech-Owl.
 †1170. HUHUA NEPALENSIS. * The Forest Eagle-Owl.
 †1178. SCOPUS BAKKAMOENA. The Collared Scops Owl.
 †1183. GLAUCIDIUM CUCULOIDES. The Large Barred Owlet.
 †1187. NINOX SCUTULATA. The Brown Hawk-Owl.

ORDER ACCIPITRES.

- †1189. PANDION HALIAETUS. The Osprey.

- +1191. *OTOGYPS CALVUS*. The Black Vulture.
 †1196. *PSEUDOGYPS BENGALENSIS*. The Indian White-backed Vulture.
 †1209. *Lophotriorchis kieneri*. The Rufous-bellied Hawk-Eagle.
 †1217. *SPILORNIS CHEELA*. The Crested Serpent-Eagle.
 †1226. *POLIOAËTUS ICHTHYAËTUS*. The Large Grey-headed Fishing-Eagle.
 †1228. *HALIASTUR INDUS*. The Brahminy Kite.
 †1229. *MILVUS GOVINDA*. The Common Pariah Kite.
 †1230. *MILVUS MELANOTIS*. The Large Indian Kite.
 1248. *ACCIPITER* SP. * (probably *VIRGATUS*. The Besra Sparrow-Hawk).
 †1251. *BAZA LOPHOTES*. * The Black-crested Baza.
 †1269. *MICROHIERAX FRINGILLARIUS*. * The Red-legged Falconet.

ORDER COLUMBAE.

- †1273. *OSMOTRERON PHAYREI*. The Ashy-headed Green Pigeon.
 †1278. *OSMOTRERON BICINCTA*. The Orange-breasted Green Pigeon.
 †1281. *TREERON NEPALENSIS*. The Thick-billed Green Pigeon.
 †1284. *CARPOPHAGA AENEA*. The Green Imperial Pigeon.
 †1287. *DUCULA GRISEICAPILLA*. The Grey-headed Imperial Pigeon.
 †1291. *CHALCOPHAPS INDICA*. The Bronze-winged Dove.
 †1302. *ALSOCOMUS PUNICEUS*. The Purple Wood-Pigeon.
 †1308. *TURTUR TIGRINUS*. The Malay Spotted Dove.
 †1311. *OENOPEPELIA TRANQUEBARICA*. The Red-Turtle Dove.
 1312. *MACROPYGIA* SP. * (probably *TUSALIA*. The Bar-tailed Cuckoo-Dove).

ORDER GALLINAE.

- +1325. *PAVO MUTICUS*. The Burmese or Javan Peafowl.
 †1327. *POLYPECTRUM CHINQUIS*. The Grey Peacock-Pheasant.
 †1328. *GALLUS FERRUGINEUS*. The Red Jungle-fowl.
GENNAEUS SP. (probably *SHARPII*, Sharpe's Silver Pheasant).
 †1353. *ROLLULUS ROULROUL*. The Green Wood-Quail.
 * ***Arboricola chloropus***. (A species of Hill-Partridge).
 †1369. *CALOPERDIX OCULEA*. The Ferruginous Wood-Partridge.
 †1374. *FRANCOLINUS CHINENSIS*. The Eastern or Chinese Francolin.

ORDER HEMIPODII.

- +1386. *TURNIX BLANFORDI*. * The Burmese Button-Quail.

ORDER GRALLAE.

- +1401. AMAUORNIS PHOENICURUS. The White-breasted Waterhen.
 †1403. GALLICREX CINEREA. The Water-cock.
 †1404. PORPHYRIO POLIOCEPHALUS. The Purple Moorhen.
 +1410. GRUS SHARPII. The Burmese Sarus Crane.

ORDER LIMICOLAE

- +1428. METOPIDIUS INDICUS. The Bronze-winged Jacana.
 †1429. HYDROPHASIANUS CHIRURGUS. The Pheasant-tailed Jacana.
 +1432. SARCOGRAMMUS ATRINUCHALIS. The Burmese Wattled Lapwing.
 +1435. HOPLOPTERUS VENTRALIS. The Indian Spur-winged Plover.
 †1439. CHARADRIUS FULVUS. The Eastern Golden Plover.
 †1447. AEGIALITIS DUBIA. The Little Ringed Plover.
 †1484. GALLINAGO COELESTIS. The Fantail Snipe.
 †1485. GALLINAGO STENURA. The Pintail Snipe.

ORDER STEGANOPODES.

- +1523. PELECANUS PHILIPPENSIS. * The Spotted-billed Pelican.
 †1526. PHALACROCORAX CARBO. The Large Cormorant.
 †1528. PHALACROCORAX JAVANICUS. The Little Cormorant.
 †1529. PLOTUS MELANOGASTER. The Indian Darter or Snakebird.

ORDER HERODIONES.

- †1541. IBIS MELANOCEPHALA. * The White Ibis.
 † **Thaumatibis gigantea.** The Giant Ibis.
 +1548. DISSURA EPISCOPUS. The White-necked Stork.
 †1549. XENORHYNCHUS ASIATICUS. The Black-necked Stork.
 +1550. LEPTOPTILUS DUBIUS. The Adjutant.
 †1552. PSEUDOTANTALUS LEUCOCEPHALUS. The Painted Stork.
 †1553. ANASTOMUS OSCITANS. * The Open-bill.
 †1554. ARDEA MANILLENSIS. The Eastern Purple Heron.
 †1555. ARDEA CINEREA. The Common Heron.
 †1562. BUBULCUS COROMANDUS. The Cattle Egret.
 †1565. ARDEOLA GRAYI. The Pond Heron.
 †1572. ARDETTA CINNAMOMEA. The Chestnut Bittern.

ORDER ANSERES.

- +1589. *DENDROCYCNA JAVANICA*. The Whistling Teal.
 +1591. *NETTOPUS COROMANDELIANUS*. The Cotton Teal.
 +1601. *Querquedula querquedula* (circia). The Garganey or Blue-winged Teal.

REPTILES AND BATRACHIANS.

BY MALCOLM SMITH.

The following species were obtained by my collector during a trip with Mr. Gairdner's party in January, February and March, 1914. They were all obtained in the Sai Yoke district, West of Long. 99° and between Lats. 14° and 14° 30'

REPTILES.

CHELONIA.

TESTUDO ELONGATA, *Blyth*.

TESTUDO EMYS, *Schleg. & Müll.*

GEOEMYDA GRANDIS, *Gray*.

PLATYSTERNUM MEGACEPHALUM, *Gray*.

A single specimen of this rare tortoise was obtained. Mr. Gairdner's Karen guide told him that it sometimes climbed the trees overhanging the streams, and that when disturbed would drop off into the water below and so escape.

LACERTILIA.

PEGUENSIS *Blyth*.

GYMNODACTYLUS MARMORATUS, *Fitz.*

The only previous record of this gecko in Siam is by Messrs. Annandale and Robinson, from Patani.

DRACO VOLANS, *Linn.*

DRACO BLANFORDI, *Blyth*.

Previously recorded in Siam from Patani and Trang. Found in the Malay States, but according to Boulenger, not below 2500 feet in the more southern portions of the Peninsula. Some of my specimens were caught at an elevation of 400 feet.

My man brought in five males and six females, and could have got many more as they appeared to be plentiful throughout the district. The wing membrane was distinctly paler in the males than

in the females. A young specimen ^(D. formosula) had black bars upon the membranes. Gular pouch in the males considerably longer than the head, in the females a short tag.

Mr. Gairdner tells me these lizards were found chiefly upon trees of the genus *Shorea*, with the bark of which their coloration harmonized very closely. The male would frequently be seen to puff out his gular pouch, which then extended forwards beneath and beyond the chin, parallel with the head.

One female specimen contained two eggs.

ACANTHOSAURA CRUCIGERA, *Blyr.*

Four specimens of this somewhat rare lizard were obtained in dense evergreen jungle. It has not previously been recorded from Siam.

CALOTES VERSICOLOR, *Daud.*

CALOTES EMMA, *Gray.*

CALOTES CRISTATELLUS, *Kuhl.*

This lizard, the common "chameleon" of the Peninsula, has not been previously recorded from Siam.

CALOTES MYSTACEUS, *Dum & Bibr.*

LIOLEPIS BELLIANA, *Gray.*

VARANUS NEBULOSUS, *Gray.*

LYGOSOMA OLIVACEUM, *Gray.*

I have received specimens of this lizard also from Bangtaphan, but it has not previously been recorded from the country.

LYGOSOMA VITTIGERUM, *Blyr.*

Two specimens of this very handsome skink were caught on trees in the Bong Tee Valley. It has not been previously recorded from Siam. One specimen had 28 scales round the body, the other 30. *Coloration* (in spirits):—A greenish white vertebral stripe bordered on either side by a black one. A less distinct and narrower dorso-lateral stripe starting from behind the eye. Sides pale greenish, thickly powdered with dark grey. Below greenish white. Digits with alternate light and dark bars, tail light brown.

LYGOSOMA MACULATUM, *Blyth.*

This widely distributed lizard does not yet appear to have been recorded from Siam. I have since seen other specimens from various parts of the country.

LYGOSOMA BOWRINGII, *Günther.*

OPHIDIA.

PYTHON RETICULATUS, *Schneid.*

POLYDONTOPHIS COLLARIS, *Gray.*

This snake, not previously recorded from Siam, appears to be fairly widely distributed throughout the country.

TRIRHINOPOLIS NUCHALIS, *Blgr.*

Two specimens of this rare snake were obtained near the border at an elevation of 700 m. Details are as follows:—

No. 1. (sex undermined, owing to damage). Total length, 458 mm., tail 53. Costals 15 throughout, the median scales faintly keeled on the posterior part of the body. Ventrals 141. Subcaudals 24.

Colour (in spirits). Above purplish brown, most of the scales edged with black so arranged across the back as to present a series of fairly well-defined circular or oval rings. Below whitish, freely speckled with black, and with large, black rectangular spots, placed laterally. A black arrowheaded mark upon the nape, beginning at the frontal shield, and a pale chevron behind it. Most of the head scales edged with black. Chin and throat white.

No. 2. Male. Total length 458 mm, tail 47. Dorsal keels more strongly marked than in No. 1. Ventrals 132. Subcaudals 24.

Colour (in spirits). Light pinkish-brown above, the black edging to the scales forming posteriorly, fairly well defined crossbars. Belly only sparsely sprinkled with black. The rectangular spots become crescentic in shape in the posterior half.

The infralabials in this species are unusual, in that the first pair are not in contact with each other, but are separated by the chin-shields which are in contact with the mental.

TROPIDONOTUS PISCATOR, *Kuhl.*

TROPIDONOTUS CHRYSARGUS, *Schleg.*

This species does not yet appear to have been recorded from the country except from Patani. It is fairly common in the jungle east of Sriracha.

COLUBER RADIATUS, *Schleg.*

COLUBER OXYCEPHALUS, *Boie.*

A large specimen of this handsome snake was found in the Bong Tee valley. It has not previously been recorded from Siam.

SIMOTES VIOLACEUS, *Cantor.*

Two specimens of this snake, not previously recorded from Siam, were taken. They belong to var. A (*Boulenger, Cat. Snakes Brit. Museum*).

HYPSERHINA PLUMBEA, Boie.

PSAMMODYNASTES PULVERULENTUS, Boie.

BATRACHIANS.

RANA MACRODON, Dum. & Bibr.

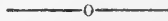
A specimen of this frog, one of the largest species known, was heard calling one stormy night in the Huey* Maw Tee Maw by my man, who immediately sallied forth and captured it. Its loud cry of "jong hong," repeated at intervals of a minute, could be heard at a great distance.

It has not elsewhere been recorded in the country except from Patani.

RHACOPHORUS LEUCOMYSTAX, Gravenh.

BUFO ASPER, Gravenh.

One specimen of this giant toad was caught in the Huey Bong Tee at an elevation of 740 m. It has not been previously recorded in Siam north of the Isthmus of Kra.



* Huey = stream.

ON TWO NEW SQUIRRELS FROM THE INNER GULF OF SIAM.

—◆◆◆—
BY C. BODEN KLOSS, F.Z.S.

In January 1915 I paid a short visit to Koh Si Chang* in the Inner Gulf of Siam and at its conclusion (having no time to go on myself to the next island) sent my collectors to Koh Phai.

Koh Si Chang has been regarded of late as the type locality of *Sciurus finlaysoni*, but in looking through the history of that name it becomes evident that this is a mistaken view and that it applies to the white squirrel of the Siamese mainland.

Sciurus finlaysoni was described by Horsfield in 1824 (*Zoological Researches in Java*) from specimens collected by Dr. George Finlayson, the naturalist who accompanied Crawford in his mission to Siam and Cambodia. It is evident that Horsfield, when erecting the species, had in mind the mainland animal, for he says that it is Buffon's "Ecuriel blanc de Siam" which was seen at Lonpeen, a village situated in the extensive forests of Siam, by P. Tachard in his travels. The account of the species closes with an extract from Finlayson's manuscript describing the white squirrel which ends "one of the specimens was shot by Lieut. Rutherford on the Islands called Sichang in the Gulf of Siam." It is once more obvious that Finlayson, too, was dealing with the mainland animal and that this reference to the island example was merely a detail as to extent of range.

Further Horsfield, in the *Catalogue of the Mammalia in the Museum of the East India Company, 1851*, again gives the locality of a specimen of *S. finlaysoni* as Siam, while Anderson who personally studied all the types of what he regarded as varieties of *Sciurus ferrugineus* states (*Zoological Research in Yunnan*, p. 244) that "the type of *S. finlaysoni* was obtained in Siam by Dr. Finlayson and another was procured by the same traveller in Sichang Id."

* Koh (Siamese) = Island.

This view of the case is much more satisfactory than the opinion held by recent workers, for the type of the *finlaysoni* group will then be one of the mainland animals and not a degenerate island form, which on account of its small size and rather yellower colour, requires a separate name and may be known as:—

Sciurus finlaysoni portus.

Sciurus finlaysoni, Anderson, loc. cit. supra; Flower (partim) *P. Z. S.* 1900, p. 355; Wroughton, *Ann. and Mag. Nat. Hist.*, ser. 8, vol. II, p. 398 (1908); Gyldenstolpe (partim) *Arkiv för Zoologi*, Band 8, no. 23, p. 11 (1914).

Type. Adult male (skin and skull) No. 1938/CBK. Collected on Koh Si Chang, Inner Gulf of Siam, 26th January, 1915.

Characters. Like *S. finlaysoni finlaysoni* of the Siamese mainland but smaller and rather yellower,

Colour. Ivory yellow throughout, most intense on the upper surface and tail; but paler, almost white, on sides of head, chin and forelimbs. Skins of nostrils, lip, ears, soles of both feet, genitals black. Eyes black. Vibrissae black,

Measurements. Ear 17.5* Skull: basilar length 36.5, braincase breadth 21.7, proximal breadth of nasals 3.3, distal breadth of nasals 6.6. For other measurements see table p. 161. Ears of the series 17—19 mm.

Specimens examined. Twenty-seven; fifteen males and twelve females, all from the type locality.

Remarks. I found *S. f. portus* very common on Koh Si Chang and very fearless. Its small size is due to its insular habitat and to the poverty of the vegetation, large scrub rather than forest, with which the island is covered. It runs busily about the stems and branches, often almost descending to the ground, in its search for food. The pelage of many of the animals obtained is considerably abraded and in every case has a sticky feeling very different from the smooth glossy hair of other squirrels, while both as skins and in the flesh a peculiar characteristic odour attaches to them.

In the series a number of animals have black vibrissae like the type, in an equal number the vibrissae are pure white, while some have

*All measurements in millimetres.

them black and white mixed. In about half the series the hairs of the distal half of the tail are black tipped.

S. finlaysoni finlaysoni has been recorded by Anderson from the mainland, by Flower from the Banpakong River, by Bonhote from the Menam at an altitude of 75 metres, by Wroughton from the Menam and Cambodia, and by Gyldenstope from the Korat Plateau.

Sciurus finlaysoni folletti.

Type. Adult female (skin and skull) No. 1991/CBK. Collected on Koh Phai, Inner Gulf of Siam, 2nd February, 1915.

Characters. Pelage generally greyish yellow; size small.

Colour. Hairs of pelage above deep neutral grey at base, at tips ivory yellow, top of head slightly deeper yellow; the sides of head, fore and hind limbs greyer owing to decrease in the yellow element, probably due to wear. Below, the base of the fur is light grey and the yellow tips are less distinct. Axillae and groin slightly washed with tawny. Toes of fore and hind feet blackish, the hairs only slightly tipped with yellow. Tail above rather paler than back, below slightly yellower, the distal half obscurely banded grey and ivory yellow: the tip blackish. Vibrissae black.

Skull and Teeth. Do not differ from the Koh Si Chang race of *S. finlaysoni* either in size or characters.

Measurements. Ear 21, Skull: basilar length 36.6, braincase breadth 22, proximal breadth of nasals 3.4, distal breadth of nasals 6. For other measurements see table p. 162. Ears of the series * 19—23 mm.

Specimens examined. Thirty-eight; seventeen males and twenty-one females, all from the type locality.

Remarks. This squirrel is subject to a certain amount of variation. When the pelage is abraded, as is frequently the case, the dorsal region is considerably darker and greyer than as given above. In some animals there is no tawny wash on axillae and groin, in others these areas are pale chesnut and the lower abdomen is also suffused with this colour.

One example has the tail ivory white throughout as in *S. finlaysoni portus* from the neighbouring island, two or three have the tip only darkened, while in a number of the specimens the tail is throughout

* Measured by native collector.

obscurely and coarsely banded dark and light. There is also a tendency to a slight darkening along the median line of the under-surface which is, though very indistinctly, margined from the colour of the sides.

In size this race most nearly approximates among mainland animals to *Sciurus floweri*, Bonhote (*Ann and Mag. Nat. Hist.*, ser. 7, vol. VII. p. 455, 1901), but, as Mr. Bonhote himself has noted, the affinities of that species are not very clear so that for the present I prefer to treat the Koh Phai animal as a race of *S. finlaysoni*. In colour there is a partial resemblance to certain phases of *S. bocourti*, Milne Edwards (*Wroughton, loc. cit. supra*), but the presence of a white tail in several examples indicates a connection with the Koh Si Chang squirrel.

I have named this island race after Mr. C. B. Follett, Superintendent of Police in charge of Koh Si Chang and Koh Phai, whose assistance rendered it possible for me to send collectors to the latter island from Koh Si Chang after I returned to Bangkok.

MEASUREMENTS OF *SCIURUS FINLAYSONI PORTUS* IN MILLIMETRES.

Locality	Sex	Head and Body	Tail	Hind foot	SKULL								Remarks	
					Greatest length	Condylobasilar length	Palatilar length	Diastrama	Upper molar row	Inter-orbital breadth	Zygomatic breadth	Median nasal length		Collector's No.
Koh Si Chang, Inner Gulf of Siam	M	180	190	44	45	39	19	10.3	9	15	26.5	11.8	1917	Adult
"	M	179	166	42	45	37.7	19	10	9.1	15	25.6	12.4	1918	"
"	F	190	193	44.5	47.5	39.3	19.2	10.4	9.2	15.4	27.7	13	1923	Aged
"	M	181	176	42	45	37.4	18.3	10	8.8	15.6	26.6	13	1925	Adult
"	F	200	190	45	47.7	41	20	10.4	9.5	16.7	28	12	1935	Aged
"	M	197	183	44	46.3	39.5	19.5	10.7	8.7	16.7	27.5	12.6	1938	Adult, Type
"	M	202	183	43	45.9	39	19.7	10.6	9	16.4	26.7	12.2	1939	"
"	M	195	190	43.5	46.4	39.7	19	10.7	9.2	16.4	27	11.8	1948	"
"	F	197	180	43.5	47	39.8	19.3	10	9.5	17	27.3	11.8	1950	Aged
"	F	197	173	42	46.3	39.3	19.5	10.6	9.2	16	27	12.2	1950	Adult
"	F	190	185	41.5	45	38.5	19	10	9	15.8	26.8	12.1	1952	"
"	F	186	192	44	46.2	39.7	20	10.7	9.3	16.5	27.7	11.6	1954	"

MEASUREMENTS OF *SCIURUS FINLYSONI FOLLETTI* IN MILLIMETRES.

Locality	Sex	Head and Body *	Tail *	Hind Foot *	SKULL								Collector's No.	Remarks
					Greatest length	Condyl. basilar length	Palatilar length	Diastema	Upper molar row	Inter-orbital breadth	Zygomatic breadth	Median nasal length		
Koh Phai, Inner Gulf of Siam	F	194	168	40	46	39	19	10	9.1	16.4	28.2	12.5	1972	Adult
"	M	187	165	40	45	38	18.5	9.9	8.5	15.5	27.9	12.3	1976	Aged
"	M	191	142	41	46	38.8	18.5	9.9	9.2	17.2	27	12.9	1978	Adult
"	F	184	152	39	46	38.3	18.8	9.9	9	17	28	11.7	1982	Aged
"	F	192	177	42	46.3	40	19	10	9	17	28	13	1991	Slightly aged, Type
"	M	186	129	41	45.4	38.5	18.3	10	9	16.4	27	12.1	1994	Adult
"	F	192	166	42	46.5	39.3	19	10	9	16.6	27.1	13	1995	"
"	F	186	168	39	46.5	39	19	10.3	9.2	16.2	27.2	13.5	2000	Aged
"	M	170	160	41	45.2	38.6	19	10	9.1	16.3	27.3	12.8	2001	"
"	M	190	157	40	45.5	38.5	18.9	10	8.9	16.5	27.1	12.2	2002	"
"	M	194	175	41	46.9	39.7	19.2	10.1	9.2	18	27.8	12	2003	"
"	F	197	171	41	46	38.4	18.5	9.8	9	16.7	27.2	13	2005	Adult

* Measured by native collector.

LIST OF BIRDS COLLECTED BY MR. EMIL EISENHOFER IN NORTHERN SIAM.

BY NILS GYLDENSTOLPE, B. A.

The following list is based upon a collection of birds made in Northern Siam by Mr. Emil Eisenhofer, Divisional Engineer of the Northern Railway. The birds were collected chiefly at Pa Hing, Bang Buei and Koon Tan—all these places being situated along the line to Chiengmai. There are many interesting and very rare species in the collection, as will be seen from the list, and a number are quite new to the Siamese fauna. Most of the species have, however, been previously recorded from Burma, the Shan States and the adjoining parts of French Indo-China.

Owing to lack of literature with me in Siam, I have been unable to go deeply into the question of subspecies. I have, therefore, followed closely the classification given by Oates and Blanford in the *Fauna of British India*, except in the case of the *Columbidae*, where I have adhered to the nomenclature adopted by Mr. E. C. Stuart Baker in his recently published *Indian Pigeons and Doves*, which is the latest work on that Family.

For the convenience of readers possessing the *Fauna of British India*, I have given the numbers in that work in brackets for each bird recorded therein.

In 1913 Mr. Eisenhofer sent a large collection to the Museum at Hannover. By the courtesy of its Director, Professor Doctor A. Fritze, all the birds were handed over to me for identification and a list of these has been published in the *Proceedings* of the Museum. The species recorded in that paper are marked with an asterisk in the following list.

Nearly all Mr. Eisenhofer's specimens are in very good condition and it is to be hoped that he will further add to his fine collection.

Fam. CORVIDÆ.

1. (4). CORVUS MACRORHYNCHUS, *Wagl.* (*) The Jungle-Crow.
2. (12). UROCISSA OCCIPITALIS, *Blyth.* (*) The Red-billed Blue Magpie.
3. (14). CISSA CHINENSIS, *Bodd.* (*) The Green Magpie.
4. (16). DENDROCITTA RUFA, *Hartl.* (*) The Indian Tree-pie.
- †5. (18). DENDROCITTA HIMALAYENSIS, *Blyth.* The Himalayan Tree-pie.

There is only a single specimen of this bird, collected at Koon Tan on the 27th of May, 1914. It does not quite agree with the description given by Oates, who says that all the primaries but the first two have a patch of white at their base. In the Koon Tan specimen all the primaries but the first have a white patch near the base.

Measurements:—wing = 135 mm.; tail = 195 mm.; culmen = 28 mm.

6. (21). CRYPSIRHINA VARIANS, *Lath.* (*) The Black Racket-tailed Magpie.
7. (25). GARRULUS LEUCOTIS, *Hume.* (*) The Burmese Jay.

Fam. CRATEROPODIDÆ.

8. (64). DRYONASTES CHINENSIS, *Scop.* (*) The Black-throated Laughing-Thrush.

One specimen shows the following measurements:—wing = 115 mm.; tail = 124 mm.; culmen = 20 mm.; tarsus = 35 mm.

9. (71). GARRULAX DIARDI, *Less.* (*) The Siamese White-crested Laughing-Thrush.
10. (72). GARRULAX PECTORALIS, *Gould.* (*) The Black-gorgeted Laughing-Thrush.
- †11. (73). GARRULAX MONILIGER, *Hodys.* The Necklaced Laughing-Thrush.
- †12. (77). GARRULAX STREPTANS, *Blyth.* Tickell's Laughing-Thrush.

Of this rare bird, which is only to be found at rather high elevations, there are some specimens from Koon Tan. Oates gives the throat and breast chocolate-brown, but I should say it is of a brownish black colour.

Measurements of four specimens:—

Wing = 140 mm.; tail = 140 mm.; culmen = 23 mm.

„ = 137 „ „ = 132 „ „ = 22 „

„ = 131 „ „ = 138 „ „ = 20 „

„ = 132 „ „ = 130 „ „ = 24 „

- + 13. (126). POMATORHINUS OCHRACEICEPS. *Wald* Lloyd's
Scimitar Babbler.

Seems to be rather rare. Only two specimens were obtained, both of them at Koon Tan.

Measurements:—wing = 95 mm.; tail = 115 mm.; culmen = 33 mm.

- + 14. (132). POMATORHINUS TICKELLI, *Blyth*. Tickell's Scimitar Babbler.

Like the preceding species, this Babbler also seems to be rather rare, and there are only two specimens in the collection, one from Hue Pu and one from Koon Tan.

The specimen from Hue Pu, a female, was shot on the 27th May, 1912, and has the following measurements:—wing = 103 mm.; tail = 103 mm.; culmen = 38 mm.; tarsus = 37 mm.

- + 15. (138). GAMPORHYNCHUS TORQUATUS, *Hume*. The Ring-necked Shrike-Babbler.

This species has only been procured in dense bamboo jungle near Koon Tan, and also seems to be rather rare. One specimen measures as follows:—wing = 98 mm.; tail = 120 mm.; culmen = 18 mm.

16. (145). PELLORNEUM SUBOCHRACEUM, *Swinh.* (*) The Burmese Spotted Babbler.

17. (176). MIXORNIS RUBRICAPILLUS, *Tick.* (*) The Yellow-breasted Babbler.

18. (187). MYIOPHONEUS TEMMINCKI, *Vig.* (*) The Himalayan Whistling-Thrush.

Measurements:—wing = 165 mm.; tail = 115 mm.; culmen = 25 mm.

In this species the bill is entirely blackish brown.

19. (188). MYIOPHONEUS EUGENII, *Hume.* (*) The Burmese Whistling-Thrush.

Measurements:—wing = 193 mm.; tail = 147 mm.; culmen = 26 mm.

20. *AETHORHYNCHUS XANTHOTIS*, *Sharpe*. (*) The Siamese Great Iora. Allied to *A. lafresnayü*, *Hartl.*; *vide F. B. I.*, No. 242. Only a single specimen—female.
- + 21. (243). *ÆGITHINA TIPHIA*, *Linn.* The Common Iora.
22. (247). *CHLOROPSIS AURIFRONS*, *Temm.* (*) The Gold-fronted Chloropsis.
23. (250). *CHLOROPSIS CHLOROCEPHALA*, *Wald.* (*) The Burmese Chloropsis.
24. (254). *IRENA PUELLA*, *Lath.* (*) The Fairy Blue-bird.
25. *MELANOCHLORA SULTANA FLAVOCRISTATA*, *Lafr.* (*) The Sultan-bird. A sub-species of *M. sultanea*, *Hodgs.*, *F. B. I.*, No. 255.
- + 26. (265). *CRINIGER GUTTURALIS*, *Müll.* The Malayan White-throated Bulbul.
- + 27. (270). *HYPSPETES CONCOLOR*, *Blyth.* The Burmese Black Bulbul.

The black patch under the ear-coverts is very small and in some species not clearly visible.

Measurements:—wing = 132 mm.; tail = 111 mm.; culmen = 23 mm.

28. (288). *OTOCOMPSA EMERIA*, *Linn.* (*) The Bengal Red-whiskered Bulbul.
29. (290). *OTOCOMPSA FLAVIVENTRIS*, *Tick.* (*) The Black-crested Yellow Bulbul.
- + 30. *IOLE OLIVACEA*, *Blyth.* Allied to *I. virescens*, *Blyth.* The Olive Bulbul, *vide F. B. I.*, No. 296.

One specimen measures as follows:—wing = 86 mm.; tail = 86 mm.; culmen = 15 mm.

31. *PYCNONOTUS ATRICAPILLUS*, *Vieill.* (*) The Chinese Red-vented Bulbul. Synonymous with *Molpastes atricapillus*, *Vieill.*, *F. B. I.*, No. 281.
32. (299). *PYCNONOTUS FINLAYSONI*, *Strickl.* (*) Finlayson's Stripe-throated Bulbul.
33. (306). *PYCNONOTUS BLANFORDI*, *Jerd.* (*) Blanford's Bulbul.
Fam. *SITTIDÆ*
- + 34. *SITTA CINNAMOVENTRIS*, *Blyth.* The Cinnamon-bellied Nuthatch. Synonymous with *S. cinnamomeiventris*, *Blyth.*, *F. B. I.*, No. 316.

- †35. (317). *SITTA NEGLECTA*, *Wald.* The Burmese Nuthatch.
 36. (325). *SITTA FRONTALIS*, *Horsf.* (*) The Velvet-fronted Blue Nuthatch.

Fam. *DICRURIDÆ*.

37. (327). *DICRURUS ATER*, *Herm.* (*) The Black Drongo.
 †38. (333). *DICRURUS CINERACEUS*, *Horsf.* The Grey Drongo.
 39. (334). *CHAPTIA ÆNEA*, *Vieill.* (*) The Bronzed Drongo.
 40. (335). *CHIBIA HOTTENTOTTA*, *Linn.* (*) The Hair-crested Drongo.
 41. (340). *DISSEMURUS PARADISEUS*, *Linn.* (*) The Larger Racket-tailed Drongo.

Fam. *SYLVIIDÆ*.

- †42. (361). *LOCUSTELLA LANCEOLATA*, *Temm.* The Streaked Grasshopper-Warbler.

A single specimen, measuring as follows:—wing = 52 mm. ; tail = 47 mm. ; culmen = 9 mm.

43. *LUSCINIOLA AËDON*, *Pall.* (*) The Thick-billed Warbler. Synonymous with *Arundinax aëdon*, *Pall.*, *F. B. I.*, No. 393.
 †44. *CRYPTOLOPHA BURKI TEPHROCEPHALA*, *Anders.* Anderson's Flycatcher-Warbler. Corresponds to *C. tephrocephala*, *Anders.*, *F. B. I.*, No. 432.
 †45. (440). *ABRORNIS SUPERCILIARIS*, *Tick.* The Yellow-bellied Flycatcher-Warbler.

Fam. *LANIIDÆ*.

- †46. (474). *LANIUS COLLURIOIDES*, *Less.* The Burmese Shrike.

The crown and nape dark ashy, with some feathers earthy brown. Forehead and lores almost white, with some small black spots.

Measurements:—wing = 84 mm. ; tail = 94 mm. ; culmen = 12 mm.

47. (481). *LANIUS CRISTATUS*, *Linn.* (*) The Brown Shrike.

48. (482). *LANIUS LUCIONENSIS*, *Linn.* The Philippine Shrike.

A single specimen. Some of the upper tail-coverts have black centres to the feathers.

Measurements:—wing = 89 mm. ; tail 90 mm.

- †49. (484). *HEMIPUS PICATUS*, *Sykes.* The Black-backed Pied Shrike.

† 50. (486). TEPHRODORNIS PELVICUS, *Hodgs.* The Nepal Wood-Shrike.

† 51. (488). TEPHRODORNIS PONDICERIANUS, *Gm.* The Common Wood-Shrike.

Fam. *CAMPHEPHAGIDÆ.*

52. (491). PERICROCOTUS FRATERCULUS, *Swinh.* (*) The Burmese Scarlet Minivet.

† 53. (500). PERICROCOTUS PEREGRINUS, *Linn.* The Small Minivet.

54. (506). CAMPOPHAGA MELANOPTERA, *Rüpp.* (*) The Pale-grey Cuckoo-Shrike.

Measurements:—wing = 113 mm.; tail = 68 mm.; culmen = 17 mm.

† 55. (507). CAMPOPHAGA NEGLECTA, *Hume.* The Small Cuckoo-Shrike.

† 56. GRAUCALUS MACEI, *Less.* The Large Cuckoo-Shrike. Synonymous with *G. macii*, *Less.*, *F. B. I.*, No. 510.

Fam. *ORIOOLIDÆ.*

57. (514). ORIOLUS INDICUS, *Jerd.* (*) The Black-naked Oriole.

58. (521). ORIOLUS MELANOCEPHALUS, *Linn.* (*) The Indian Black-headed Oriole.

Fam. *EULABETIDÆ.*

59. GRACULA JAVANA INTERMEDIA, *Cuv.* (*) The Indian Grackle. Synonymous with *Eulabes intermedia*, *A. Hay*, *F. B. I.*, No. 524.

Fam. *STURNIDÆ.*

† 60. (538). STURNIA MALABARICA, *Gm.* The Grey-headed Myna.

61. (543). AMPELICEPS CORONATUS, *Blyth.* (*) The Gold-crest Myna.

62. (546). GRACULIPICA NIGRICOLLIS, *Payk.* (*) The Black-necked Myna.

† 63. (549). ACRIDOTHERES TRISTIS, *Linn.* The Common Myna.

64. (553). AETHIOPSAR GRANDIS, *Moore.* (*) The Siamese Myna.

† 65. (556). STURNOPASTOR SUPERCILIARIS, *Blyth.* The Burmese Pied Myna.

One specimen only. From the neighbourhood of Bangkok Dr. Bowdler Sharpe has described a bird closely allied to *Sturnopastor super-*

ciliaris and has named it after Capt. Stanley S. Flower. This bird, *S. floweri*, Sharpe, has the upper parts of a blackish color, while those in *S. superciliaris* are brownish black. The specimen in Mr. Eisenhofer's collection agrees better with the description of *S. superciliaris*, and I have therefore referred it to that species, as I have at present no material for comparison.

Its measurements were as follows:—wing = 122 mm.; tail = 77 mm.; culmen = 27 mm.; tarsus = 30 mm.

Fam. *MUSCICAPIDÆ*.

† 66. (562). *SIPHIA ALBICILLA*, *Pall.* The Eastern Red-breasted Flycatcher.

† 67. (572). *CYORNIS OATESI*, *Salv.* The Rufous-bellied Blue Flycatcher.

Of this rare bird there is only a fine male specimen in the collection, with the following measurements:—wing = 86 mm.; tail = 63 mm.; culmen = 10 mm.; tarsus = 20 mm.

68. *CYORNIS DIALILEMA*, *Salv.* (*) The Blue-throated Flycatcher. Synonymous with *C. rubeculoides*, *Vig.*, *F. B. I.*, No. 575.

† 69. (579). *STOPAROLA MELANOPS*, *Vig.* The Verditer Flycatcher.

† 70. (588). *ALSEONAX LATIROSTRIS*, *Rajfl.* The Brown Flycatcher.

71. (592). *CULICICAPA CEYLONENSIS*, *Swains.* (*) The Grey-headed Flycatcher.

72. (599). *TERPSIPHONE AFFINIS*, *Hay.* (*) The Burmese Paradise Flycatcher.

73. (601). *HYPOTHYMIS AZUREA*, *Bodd.* (*) The Black-naped Flycatcher.

Stresemann has recently published a paper (*Nov. Zool.*, Vol. 20, No. 2, 1913) on the subject of the different subspecies of this widely distributed bird, and he believes that the race inhabiting Siam ought to be referred to *Hypothymis azurea styani*, *Hartl.* The range of distribution of this subspecies is given as Hainan, Siam, Cochin-China, Tenasserim, Burma, Assam, Bengal, Himalayas and Northern India as far south as the Deccan. Owing to lack of material for comparison it is impossible for me to make out if the birds in

Mr. Eisenhofer's collection are *Hypothymis azurea styani*, Hartl., or one of the other closely allied forms. For such an enquiry large series are necessary, and up to the present very little has been done to investigate the avifauna of Siam. In a later paper I hope to be able to solve the question whether this subspecies occurs in Northern Siam or not.

Fam. TURDIDÆ.

74. PRATINCOLA CAPRATA BICOLOR, *Sykes*. (*) The Common Pied Bush-Chat. Synonymous with *P. caprata*, Linn., *F. B. I.*, No. 608.
- + 75. (615). OREICOLA FERREA, *Hodgs*. The Dark-grey Bush-Chat
76. (632). HENICURUS SCHISTACEUS, *Hodgs*. (*) The Slaty-backed Forktail.
- + 77. (634). HENICURUS LESCHENAUTI, *Vieill*. Leschenault's Forktail.

One specimen from Koon Tan with the following measurements:—wing = 108 mm.; tail = 137 mm.; culmen = 21 mm.: tarsus = 29 mm.

78. (663). COPCYCHUS SAULARIS, *Linn*. (*) The Magpie-Robin.
79. (664). CITTOCINCLA MACRURA, *Gm*. (*) The Shama.
80. MONTICOLA SOLITARIA PHILIPPENSIS, *P. L. S. Müll*. (*) The Eastern Blue Rock-Thrush. Synonymous with *Petrophila solitaria*, Müll., *F. B. I.*, No. 692.
- + 81. MONTICOLA CYANEA, *Linn*. The Western Blue Rock-Thrush. Synonymous with *Petrophila cyanus*, Linn., *F.B.I.*, No. 693.
- + 82. (698). OREOCINCLA DAUMA, *Lath*. The Small-billed Mountain-Thrush.

Fam. PLOCEIDÆ.

- + 83. (726). MUNIA ATRICAPILLA, *Vieill*. The Chestnut-bellied Munia.
- + 84. (727). UROLONCHA ACUTICAUDA, *Hodgs*. Hodgson's Munia.

Fam. FRINGILLIDÆ.

- + 85. (761). CARPODACUS'ERYTHRINUS, *Pall*. The Common Rose-Finch.

86. (797). *EMBERIZA AUREOLA*, *Pall.* (*) The Yellow-breasted Bunting

Fam. *MOTACILLIDÆ*.

- +87. *MOTACILLA ALBA LEUCOPSIS*, *Gould.* The White-faced Wagtail. Synonymous with *M. leucopsis*, *Gould*, *F. B. I.*, No. 827.
88. *MOTACILLA BOARULA MELANOPE*, *Pall.* (*) The Grey Wagtail. Synonymous with *M. melanope*, *Pall.*, *F. B. I.*, No. 832.
- +89. (833). *MOTACILLA BOREALIS*, *Sundev.* The Grey-headed Wagtail.
- +90. (839). *LIMONIDROMUS INDICUS*, *Gm.* The Forest-Wagtail.
91. *ANTHUS TRIVIALIS MACULATUS*, *Jerd.* (*) The Indian Tree-Pipit. Synonymous with *A. maculatus*, *Hodgs.*, *F. B. I.*, No. 841.
- +92. *ANTHUS RICHARDI STRIOLATUS*, *Blyth.* Richard's Pipit. Synonymous with *A. richardi*, *Vieill.*, *F. B. I.*, No. 845.
- +93. (847). *ANTHUS RUFULUS*, *Vieill.* The Indian Pipit.

Fam. *ALAUDIDÆ*.

94. (873). *MIRAFRA MICROPTERA*, *Hume*, (*) The Burmese Bush-Lark.

Fam. *NECTARINIDÆ*.

- +95. (884). *AETHOPYGA CARA*, *Hume*. (*) The Tenasserim Yellow-backed Sun-bird.

There is only a single (male) specimen in the collection.

- +96. (898). *ARACHNECHTHRA FLAMMAXILLARIS*, *Blyth.* The Burmese Yellow-breasted Sun-bird.
97. (909). *ARACHNOTHERA LONGIROSTRIS*, *Lath.* (*) The Little Spider-hunter.

Fam. *DICÆIDÆ*.

98. (912). *DICÆUM CRUENTATUM*, *Linm.* (*) The Scarlet-backed Flower-pecker.
99. (914). *DICÆUM CHRYSORHÆUM*, *Temm.* (*) The Yellow-vented Flower-pecker.
100. (921). *PIPRISOMA SQUALIDUM*, *Burt.* (*) The Thick-billed Flower-pecker.

Fam. *PITTIDÆ*.

+ 101. *ANTHOCINCLA PHAYREI*, *Blyth*. Phayre's Pitta. Synonymous with *A. phayrei*, Blyth, *F. B. I.*, No. 926.

+ 102. (928). *PITTA OATESI*, *Hume*. The Fulvous Pitta.

There is only a single specimen of this rare bird in the collection. Its measurements are, as follows:—wing = 115 mm.; tail = 72 mm.; culmen = 25 mm.; tarsus = 52 mm.

+ 103. (930). *PITTA CYANEA*, *Blyth*. (*) The Blue Pitta.

Sparingly distributed in suitable localities in Loi Koon Tan.

104. (931). *PITTA CYANOPTERA*, *Temm.* (*) The Lesser Blue-winged Pitta.

(*To be continued.*)

— : —

THE SNAKES OF BANGKOK.

BY

MALCOLM SMITH, M.R.C.S., L.R.C.P.

Subfamily. *DIPSADOMORPHINÆ.*

30. *Dipsadomorphus multimaculatus.*

Siamese ๓ ๓ (nuju sing) ?

A rare snake in Bangkok. Mr. Tatner tells me that several years ago, when the grass was being cut at the Sports Club, a small patch remained which the men were afraid to enter owing to some very fierce snakes which they said were in it. He went out with the men, and as the cutting was completed and the snakes driven forth, killed no less than 13 of this species. I have never seen any other specimens from Bangkok.

This snake bears a superficial resemblance to Russell's Viper, and at a casual glance might be mistaken for it. Russell's Viper, however, is a much heavier snake, and the spots are larger, more distinct, and somewhat differently arranged. In lepidosis the two species are entirely different.

Length. The largest specimen I have seen came from Sanam Cheng and measured 890 mm. in total length. It appears to be longer than any previously recorded.

Color. Light brown or greyish brown above, with two series of roundish dark brown dorso-lateral spots, and a series of smaller spots or short cross bands on either flank. These spots are usually paler in the centre, and are edged with white. Below, whitish or yellowish, spotted and speckled with pale brown. Head with a blunt \wedge -shaped mark above, and with a dark band from the eye to the angle of the mouth.

Distribution. From Southern China and Burma to the Malay Peninsula and Archipelago.

31. *Psammodynastes pulverulentus*. *The Mock Viper.*

I have seen two specimens of this little snake, both from Dusit Park. It is fairly common in some parts of the country. One which I kept alive for some time was shy and very active, but made no attempt to bite when handled. It fed upon frogs.

Distribution. From the Eastern Himalayas and Southern China to the Malay Peninsula and Archipelago.

32. *Dryophis mycterizans*. *The Common Green Whip Snake.*

Common in Bangkok. This snake is entirely arboreal in its habits, living among the bushes and hedges about the gardens and plantations. I have hardly ever seen one on the ground, nor do I think they ascend trees to any great height. It is of a gentle and placid disposition. Individuals that have only just been caught show hardly any fear of one, and will, after a few hours, allow themselves to be handled quietly and without protest. As an instance of the placid nature of this snake, a half grown specimen was once found in my garden and brought in at tiffin time. It was placed among the flowers on the table, and remained there calmly throughout the entire meal, watching me, but making no effort to get away. Old ones are sometimes bad tempered, and cannot always be trusted. Unlike most snakes, that bite at your hands, they have a nasty habit of watching your face, and especially your eyes, and then suddenly making a dart at you. Fortunately the teeth in the front of the jaws are extremely small, and they are unable to inflict any damage. It is the only snake I know of that the Siamese are not afraid to handle, and boys may be sometimes seen carrying one along, fastened with a noose of thread or string.

The Green Whip Snake appears to take more interest in its surroundings than most snakes. Captive specimens may be frequently seen to observe one, following with both head and eyes whatever is taking place before them. The rest of the body is kept absolutely still. They hardly ever move about their cage, and will remain extended upon a branch in almost the same position for days together. I should imagine that these snakes in a wild state seldom go in search of their food, but rather wait for their prey to come to them. For this purpose their protective coloring, harmonizing so perfectly with the

foliage among which they live, must be of the greatest value. They feed chiefly upon lizards and small birds, killing the latter by constriction.

Length. The largest specimen I have seen measured 1670 mm.

Color (in life). Verdant green, paler below than above. A yellow or white line at the outer border of the ventral shields. Throat white. Interstitial skin in the fore part of the body, alternately white and black. Iris golden yellow with horizontal pupil. The young have generally two fairly distinct whitish lines down the middle of the belly.

The identification of this snake is easy, the coloration, the elongated head with the curious tip to the snout, and the horizontal pupil, serving to distinguish it easily from the Green Pit Viper, the only other entirely green snake that is found in Bangkok.

Distribution. India, Ceylon, Burma, Siam. This species does not extend into the Malay Peninsula and it would be interesting to find out its most southern habitat in this country.

33. *Chrysopelea ornata.* *The Green and Black Tree Snake.*

Siamese จ ฎีจ (*ngu khieo*).

Very common in Bangkok, and, owing to its partiality for living in houses, is the snake which is brought more into contact with the residents of the town than any other kind. There is probably hardly a house or office where it has not been met with at some time, and one might safely say, that of every ten snakes encountered inside dwelling places, eight of them would prove to be of this species. This partiality for living in habitations is by no means universal, but appears more especially to be a trait of Bangkok individuals. Its climbing powers are extraordinary and are shown at their best amongst masonry. The special formation of its ventral shields greatly assists it in these performances, and by taking advantage of every projection, crack and corner available, it is enabled to scale perpendicular walls and to reach positions apparently quite inaccessible.

Chrysopelea ornata is a bold and courageous snake, and, for its size, extremely powerful. Its habits are diurnal. It is a voracious feeder and will, I believe, devour anything that it can overcome. Mice, birds, lizards and frogs have all been recorded as forming part of its diet, but I do not think that other snakes have yet been mentioned. In the stomach

of one sent me last year, I found the head and fore part of the body of a young tree-snake (*Dendrophis pictus*). Even the great "tuk-kaa" (*Gecko verticillatus*) is not secure against this rapacious creature, and I know of several occasions on which it has been tackled. It is not always that the snake comes out of these combats unharmed, and considering the tremendous bite which this lizard can give, it is not surprising. In one encounter at least that I know of, the gecko had got a firm hold immediately behind the head of its opponent, and although the snake ultimately proved the victor, it was so badly damaged as to be only just able to crawl away, leaving its victim uneaten.

I have seen this snake, also, catch a full grown mouse, crush it to death in its coils, and swallow it, the whole operation being accomplished in mid-air, the snake suspended by its tail only from a small branch.

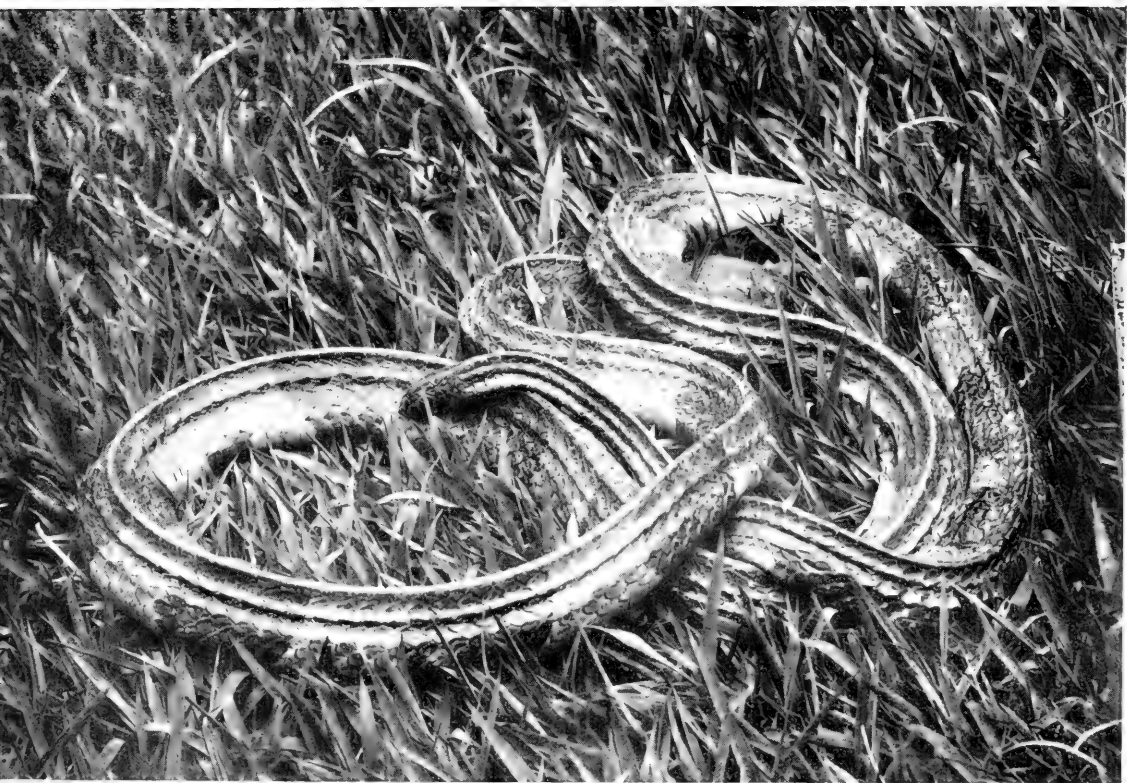
Flower calls it the fiercest snake he has ever met, and says that individuals which he tried to keep in captivity showed no signs of becoming tamer, and were also an annoyance to other inmates of the cage. I have not found this so. Those I have kept became moderately tame, and soon allowed themselves to be handled.

Length. 1400 mm.

Color. Very variable, but only one form (*var. D. Blgr. Cat. Snakes*) is found in Bangkok, and as far as I am aware, throughout the whole of Siam. It is as follows:—Above pale green, each scale edged with black and with a median black line, giving the whole the appearance of fine longitudinal lines drawn down the body, with finer diagonal cross-lines. Below, a paler green, with a series of black dots at the lateral keel. Subcaudals edged with dark grey. Head yellowish, extensively marked with black, which takes the form of transverse bars.

In the young, the black lines mentioned above, coalesce and form a regular series of dorsal cross-bars. In some specimens this is so marked that the snake appears to be black, with narrow green cross-bars.

Distribution. India, Ceylon, Burma and Southern China to the Malay Archipelago.



The Banded Krait (*Bungarus fasciatus*), poisonous.

Subfamily. *HYDROPHINÆ*. The Sea Snakes.

Siamese งูทะเล (*ngu talay*).

34. **Enhydrina valakadien**.

35. **Enhydris Hardwickii**.

Both the above species have been occasionally recorded from Bangkok, having been caught in the river Menam. The true Sea Snakes are, however, strictly inhabitants of the salt water and their occurrence here can only be regarded as accidental, carried up probably upon some unusually heavy tide.

As far as is known at present, all the Sea Snakes are extremely poisonous.

Subfamily. *ELAPINÆ*.

36. **Bungarus fasciatus**. *The Banded Krait*.

Siamese. งูสามเหลี่ยม (*ngu sam liem*).

The Siamese name refers to the marked triangular shape which the body of this snake has in section, and which is produced chiefly by the prominence of the vertebral region.

It is curious that Flower did not record this snake from Bangkok, or indeed meet with it himself in any part of the country. Its vivid and striking coloration make it unusually conspicuous, whilst its sluggish movements render it an easy victim whenever encountered by man. Its strictly nocturnal habits have probably saved it on many occasions.

The Banded Krait, whilst by no means common in Bangkok, is not infrequently met with. It prefers, I believe, the open country, but has been found in many parts of the town. One of the finest specimens I ever caught, was in hiding beneath a box beside the Chancery at the British Legation, whilst a young one was once sent me, having been killed in the dining room of the mess at the Borneo Company. In disposition it is an extremely quiet and inoffensive creature, and I have never seen one attempt to bite, even under strong provocation. Its strange behaviour and the attitude which it often assumes when captured is well illustrated in the accompanying photograph. Instead of endeavouring to escape, it throws its body into a loose coil or two, and hides its head away beneath some part of

it. Perhaps like the ostrich of fable, with its head concealed, it thinks itself entirely hidden from view. If provoked with a stick it will give a convulsive jerk or two, and hide its head again beneath some other part of the body. If left undisturbed, it will remain in this position for a long time. The photograph was taken the day after the snake had been caught, and although it gives no idea of the brilliant contrasts in colouring, shows very clearly the strong vertebral prominence, and the blunt, enlarged ending to the tail which is characteristic of this snake.

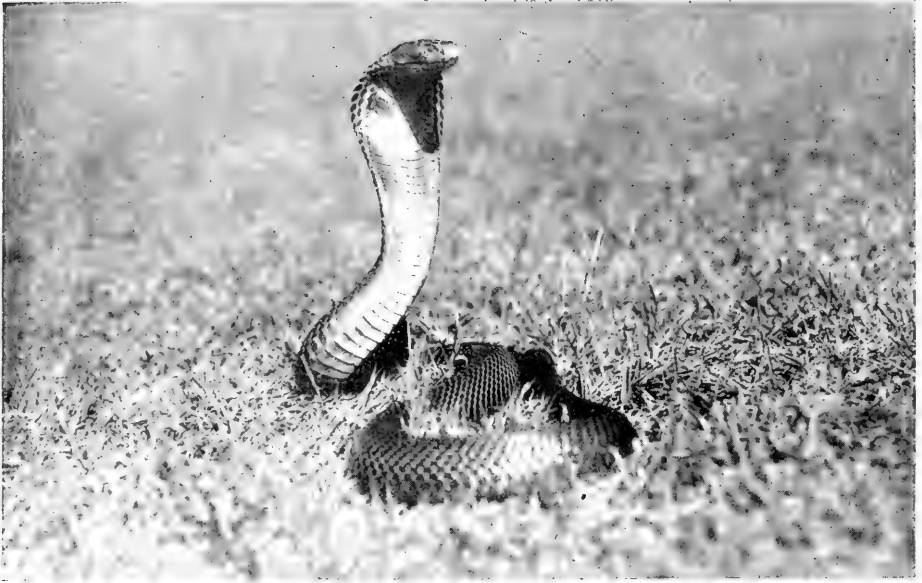
The Banded Krait feeds almost entirely upon other snakes.

Length. This snake grows to a great size in Bangkok. I have seen seven specimens over 6 feet in length. One of the largest ever recorded was mentioned previously in this *Journal* (No. 1, Vol. I, p. 58), and I have since seen another almost as long. It was killed at Klong Rangsit and measured 1955 mm. in length.

Poison. No authentic case of a bite from this snake in man has yet been recorded, but the poison appears from experimental evidence to be considerably less toxic than Cobra venom, and is possibly not fatal to human beings.

Color. The coloration of the Banded Krait is so distinctive that it is quite impossible to mistake it for any other snake in Bangkok. It is commonly described as being marked with alternate broad bands of black and yellow, which completely encircle the body. In the majority of Bangkok specimens, however, except in very large ones, this yellow color is buff or dirty buff above, pale yellow below, the two shades meeting with a distinct line of demarcation at the costo-ventral junction. These yellow bands number from 17 to 23 on the body and from 3 to 4 on the tail. Many Siamese specimens have in addition a variable patch of black upon the belly in some of the ventral bands. Wall mentions this as occurring in a specimen which he examined in Hongkong, but it does not appear to occur elsewhere. There is a black mark upon the top of the head, beginning between the eyes and widening and extending backwards into a saddle-shaped mark upon the neck. The blunt and enlarged tip to the tail which is characteristic of this snake in adult life, I have not found in the young. The whole snake has a fine polished appearance.

Distribution. India, Burma, and South China to the Malay Archipelago.



The Cobra (*Naia tripudians*), poisonous.

37. *Naia tripudians*. *The Cobra*.

Siamese งูเห่า (*ngu hao*).

Various other names are also used, such as งูเห่าดง (*ngu hao dong*), งูเห่าม้อ (*ngu hao maw*), งูเห่าดอกจันทน์ (*ngu hao dork chan*), according to markings and coloration. The last named term, meaning the sandal-wood flower, but also used to designate any small round mark, is applied generally to those specimens that have a well-defined circular mark upon the hood.

The name "ngu hao", or the snake that barks, has no doubt been given to it on account of the characteristic spitting or explosive hiss which it makes when angered.

The Cobra, fortunately for Bangkok residents, cannot be considered a common snake, although it is by no means rare. In the country round it is more plentiful, and in some localities, (notably at Klong Rangsit and Pachim, and probably also at many others) is very plentiful. In Bangkok it may be found almost anywhere, being more abundant upon the West side of the river than upon the East. The many old and disused buildings there harbour a considerable number of them, among the foundations of which they find easy and convenient hiding places. In the country districts, away from habitations, they live upon the open grass-lands and in the paddy fields, finding shelter in holes in the earth, chiefly those that have been made by rats. In those places, as the country is completely under water for several months in the year, they must be flooded out of their homes, and forced, for the time, to lead a semi-aquatic existence.

It is astonishing how few Europeans in Bangkok, with the exception of those who have come from India, where they have been treated to displays by snake charmers, have ever seen a cobra alive. Under ordinary circumstances, when moving about in search of food, or when lying in repose, the so-called "hood" is not expanded at all, but lies as a loose fold of skin on either side of the neck, adding but little to its thickness, and hardly noticeable. It is only in the presence of danger, when suddenly encountered and confronted, that the characteristic pose is assumed, with the fore part of the body perpendicularly erect and the

“hood” spread out. This menacing attitude however, threatening as it may appear, usually goes no further, and the snake if left undisturbed, will soon quieten down and glide away. I have never seen a cobra take the offensive, and it will not, I believe, attempt to bite one, unless thoroughly angered or actually seized. The accompanying illustrations, of specimens that had been recently caught, were taken upon an open lawn. They were photographed at a distance of from 3 to 4 feet, and are a further testimony, I am sure the photographer will not object to my saying so, more to the non-aggressive disposition of the creature, than to his own courage. Adult cobras when met with in their native haunts, generally seek refuge in immediate flight, and disappear into the nearest shelter available. Young ones are more aggressive. They are very alert, inclined to bite readily, and undoubtedly more dangerous.

Cobras live well in captivity and are voracious feeders. Their natural food is small mammals, (chiefly rats), frogs, toads, and sometimes other snakes. My own experience with them in captivity is unusual, in that they feed almost entirely upon toads. The reason of this is not one of preference, as they will readily devour dead rats and frogs if placed before them, but simply because they are not sufficiently quick to catch anything else. Even the slow-hopping toad is not caught with any ease and certainty. I have watched them when feeding on numberless occasions, and also when angered and fighting with each other in their cage, and so often do they miss and go wide of the object at which they strike, that they given one the impression of having defective sight. Or else they are particularly clumsy. In dealing with toads they do not attempt to make any use of their poison, but proceed at once to swallow the creature alive.

Poison. Upon the rare occurrence of cases of cobra bite in Bangkok, I have already remarked (No. 1, Vol. I, p. 6). They occur more frequently in the outlying districts, as the records of the Pasteur Institute, during the short time in which it has been opened, will show. Dr. Robert who is in charge, told me that all that he had seen had occurred at night, and were due to the snake having been accidentally trodden upon in the dark. Dr. Yai Sanitwongse also informs me, that since the decree has been issued for the destruction of Java weed in this country, quite a number of people have been bitten at Klong Rangsit. The snakes, it would appear, during the hot and



Cobras.



dry months of the year, retire to the canals, for cobras drink freely and do not like to be long without water. Here they find excellent shelter, and can lie entirely concealed among the dense packs of this weed, and the people in dragging it out to destroy it, accidentally seize the snakes and so get bitten.

The treatment of cobra bite is not within the scope of this article, but I may mention briefly, that the permanganate of potash cure, so strongly boomed a few years ago, has shown itself to be of much less value than was originally claimed for it. The only antidote at present known of any real benefit, is antivenene, a large stock of which is now always on hand at the Pasteur Institute. Ligature above, and deep incisions at the seat of, the bite, should of course always be performed at once.

Length. 1830 mm.

Color (in life). Above.—From darkish olive-brown to black. Hood usually adorned with a clear, pale yellow or whitish circle or oval. It may be incomplete and indistinct, but is seldom entirely absent. Across the back, just behind the hood, usually a pale chevron or oval mark or only a plain bar, and sometimes one or two or more similar marks farther down the body. Below.—Throat and commencement of body yellow, rest of belly and tail grey or pale brown. Hood usually with a black spot on either side, and a dark transverse bar behind. The transverse markings across the back, may be continued as yellowish bars across the belly. The young when first born are black, usually with a high polish like a well polished boot. As they grow up they become lighter. The markings upon the hood are even more variable than I have mentioned, and it would be unnecessary to describe them all. This description applies to Bangkok and the neighbouring country only.

Distribution. Southern Asia, from Transcaspia to China and the Malay Archipelago.

Family. *AMBLYCEPHALIDÆ.*

38. *Amblycephalus moellendorffii.*

Count Gyldenstolpe records a specimen of this little snake from Bangkok, and another was recently found in a garden in the Suriwongse Road.

Distribution. S. China, Indo-China, Siam, Tenasserim.

Family. VIPERIDÆ.

39. *Vipera Russellii*. *Russell's Viper*.

Siamese งู แมว เสอ (*ngu maaw sao*).

The origin of the words "maaw sao," meaning "sleepy cat," is obscure, but may refer to the lethargic disposition of this creature.

As far as I am aware, the only specimen of this poisonous snake that has been found in Bangkok was one killed on the grounds of the Sports Club several years ago. It has been met with in several localities near Bangkok, but appears to be nowhere common. My collector once caught one in the roof of an attap shelter upon a raft at Sam Kok, an unusual position to find this snake in, as its corpulent build does not at all fit it for climbing. It is no doubt in this way, namely drifting down the river upon some log or floating structure, that most of them find their way to us from the North. Russell's Viper is not usually accounted a lover of the water, and the wet paddy plains of this part of the country, are probably not to its liking.

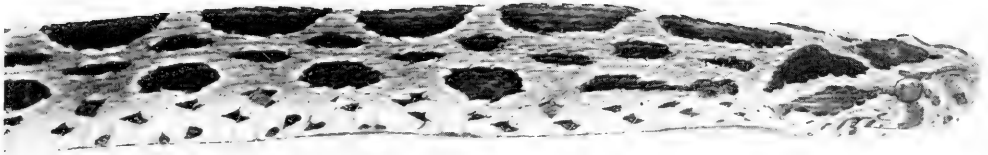
In disposition it is sluggish in the extreme, and will usually not attempt to move out of the way when met with. The three occasions that I know of, when snipe shooters have encountered it, all confirm this, the snake making no attempt to escape and allowing itself to be shot at close quarters.

The only specimen I ever kept alive, fed readily upon mice.

Poison. The poison of Russell's Viper, although less toxic than cobra venom, is fatal to man, death occurring in the cases which have been recorded, in about 24 hours or longer.

Length. 1600 mm.

Color (in life). Light brown above, with three longitudinal chains of large dark brown oval spots, the dorsal row somewhat larger than the two lateral ones. The spots have a black periphery and are edged with white. Between them are two other series of spots, considerably smaller and much elongated, and others adorn the flanks lower down. Belly white, with dark semi-lunar spots. Head with dark symmetrical markings, including a lozenge shaped patch upon the forehead, another patch below the eye, and a streak from the eye to the angle of the mouth. The photograph is excellent. Upon the superficial resemblance of this snake to the harmless *Dipsadomorphus multimaculatus* I have already remarked.



Russell's Viper (*Vipera Russellii*), poisonous.



The Common Green Tree Viper (*Lachesis Gramineus*), poisonous.



Distribution. India, Ceylon, Burma, Siam.

40. **Lachesis gramineus.** *The Common Green Pit Viper.*

Siamese งูเขียวหางไหม้ or หางแดง (*nyu khieo hāng mai or hāng daung*).

“Hāng mai,” meaning literally “burnt tail”, refers to the rusty coloration upon the tail of this snake.

It is by far the most common poisonous snake that is to be found in Bangkok, frequenting the gardens and plantations everywhere, usually arboreal in its habits, but seldom found at any great elevation above the ground. One at least, is generally to be seen in the large bamboo clump in my compound, and I have had many opportunities of watching the habits of these snakes. The same one seldom remains there for any length of time; a few days perhaps, or sometimes a few weeks, and then it is gone and another one takes its place.

They are very sluggish creatures. When discovered they seldom endeavour to escape, or even show any signs of alarm, but remain quietly in their position, eyeing one steadily. Sometimes one will lift its head fiercely, as if protesting at the disturbance. Even when actually dislodged from their post, they preserve the same calm demeanour, and move away in a quiet and leisurely manner. They can, however, be extremely fierce, and when once roused will bite furiously. Their habits are strictly nocturnal, and they do not move about until it is quite dark. On the other hand, they are not particular where they lie up during the day, and any shady bough or nook, provided it is not actually exposed to the sun, seems to satisfy them. After feeding they remain completely at rest until their meal is digested, and this may occupy many days. One, I remember, remained in exactly the same position for 15 days, apparently without moving at all. Another one that I watched, lived in a hole in a tree, and when hungry and in need of food, could be seen each night outside its home. How far afield it went in search of prey I do not know, but I never saw it very far away, and in the morning it was back again in the hole. It remained in this spot for ten weeks, and then disappeared.

In captivity these vipers live well, feeding upon mice, frogs and lizards, particularly the house gecko. In catching mice, they seize the animal if possible across the middle of the back, burying their long fangs deeply into the vital parts of the body. I use the word seize,

for they do not strike and let go, but continue to hold on, and do not relax their grip, until the victim is quite dead. A mouse caught in this way dies with extreme rapidity, generally in two or three minutes, and beyond a few faint convulsive kicks does not struggle at all. The actual paralyzing factor in this case is no doubt shock. If perchance, from the snake not being sufficiently quick, some other part of the animal is caught, such as a limb or the head, death is by no means so rapid, and the mouse usually manages to shake itself free and escape. The snake then goes off in search of it, but appears to have no sense of direction, and in a wild state, if the animal had been able to travel any distance before collapsing, would certainly not be found.

Poison. The poison of this snake is almost entirely local in its action. It is fatal to small mammals, but can hardly be considered dangerous to human beings. I see a fair number of patients who have been bitten by this snake every year, and their symptoms vary in intensity from those with slight swelling round the bitten part and practically no pain, to others with considerable swelling and very severe pain. General symptoms are entirely absent, except for some occasional slight feeling of giddiness, which may be due to a very natural trepidation on the part of the patient. In my own case, which may be looked upon as a severe one, I was bitten in the terminal joint of the right thumb whilst incautiously handling the snake. I had seized it too far down the neck, and it was able to turn its head round and bite me. Fortunately it could only reach me with one fang, but that one went deeply in. The pain was intense and immediate, as if a red hot needle had been thrust into me, and it continued with great severity for 24 hours. Sleep was impossible without opium. The whole hand as far as the wrist swelled rapidly up, and at the actual seat of the bite, a small area, as big as a pea, became necrotic and ultimately sloughed away. The swelling of the hand subsided within a week, but in the thumb itself it persisted much longer, and it was six weeks before the wound had healed and I had recovered the full use of my hand. Treatment in this case consisted in applying a ligature to the base of the thumb until the pain from the constriction became unbearable, and in scarifying the wound and rubbing in crystals of permanganate of potash. Owing to the difficulty, however, of operating upon myself with my left hand,

this part of the treatment was not sufficiently deep to be of any value.


Length. Up to 870 mm.

Color (in life). Above verdant green, below pale green, yellowish green, bluish green or light blue. There is usually a well-marked flank line, upon the last row of the costal scales beginning at the neck and running the entire length of the body and tail. It may be white, yellowish or pale blue in colour. Dorsum of tail and tip, reddish brown. Interstitial skin blackish, the colour often extending on to the adjacent scales and forming indistinct dark cross bars. Iris golden yellow with vertical pupil.

This snake is well known to the Siamese, and its local name may be relied upon.

Distribution. From India to China and the Malay Archipelago.

This concludes the Snakes of Bangkok. Three other species will probably have to be recorded, namely, *Dryophis prasinus*, *Hypsirhina plumbea*, and *Typhlops siamensis*. The two former are fairly common in the country districts outside the city, and there appears no reason why they should not be found in Bangkok. Of the earth snake, *T. siamensis*, only one specimen is so far known, obtained by M. Mouhot many years ago. Last year, however, Major Sprater was given a snake, caught at Bangsue, which I considered to be this species, in spite of some slight differences in lepidosis. He took it home with him to compare with the type specimen in the British Museum but unfortunately the War broke out before he was able to do so.



KEY TO THE SPECIES DESCRIBED.

The accompanying key will enable anyone, with a little care and trouble, to identify all the species described in the previous articles. It is entirely an arbitrary key, and is of no value elsewhere.

Method of using the key. Count the number of costal scales across the middle of the body, as shown in the diagram opposite p. 5 of this volume, and compare it with the color description given. Note that the middle of the body is mid-way between the head and the vent, and not the head and the tip of the tail. The characters of the scales given, although not essential to this list, will be of further assistance. The "keel" is a more or less pronounced ridge down the centre of a costal scale, and is an important feature in identification.

Costal scales.	Character of scales.	Name of Species.	Page in Journal.
		Ventral shields enlarged	
13	Smooth	Dryocalamus Davisonii	93
15	Smooth	Xenopeltis unicolor	12
"	"	Zamenis korros	94
"	Vertebrales } enlarged }	Dendrophis pictus	96
"	"	Dryophis mycterizans	174
"	"	Bungarus fasciatus	177
16-17	Partly keeled	Zamenis mucosus	93
17	Smooth	Chrysopelea ornata	175
"	"	Psammophis condanarus	17
"	"	Lycodon aulicus	16
"	"	Simotes Mouhoti	99
19	Smooth	Simotes taeniatus	98
"	Partly keeled	Coluber radiatus	95
"	Vertebrales } enlarged }	Dipsadomorphus multimaculatus	173
"	Keeled	Tropidonotus piscator	14
"	"	Tropidonotus subminiatus	15
19-21	Smooth	Naia tripudians	178
21	Smooth	Simotes cyclurus	97
"	"	Hypsirhina enhydria	100
"	Keeled or not	Lachesis gramineus	182
27	Smooth	Hypsirhina bocourti	100
29-31	Keeled	Vipera Russellii	181
35-39	"	Herpeton tentaculatum	103
45-47	"	Homalopsis buccata	101
70-80	Smooth	Python reticulatus	9
		Ventral shields not enlarged	
20	Smooth	Typhlops braminus	8
21-23	"	Cylindrophis rufus	10
—	Tubercular	Acrochordus javanicus	13

FIREFLIES AND GLOW-WORMS AND THEIR LIGHT.

BY K. G. BLAIR, B.SC. F.E.S.

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There is perhaps no more striking phenomenon in the insect world, than the brilliant and frequently flashing lights exhibited at night by the insects popularly known as Fireflies and Glow-worms, yet at first sight it is astonishing how little is known to scientists at home of the habits of these insects, and of the part played by this luminosity in their life history. But when we consider that our knowledge of these creatures is almost entirely based on the dried specimens of our collections, which are practically never accompanied by detailed or in any way critical notes on their habits as observed by the collectors, this deficiency in our information on the subject becomes more readily intelligible.

The lack of co-operation between the systematic student at home and the actual collector in the field, whether a trained entomologist or not, was particularly brought home to me in conversation on this subject with my friend Mr. K. G. Gairdner on the occasion of his present visit to this country, and it is at his request that these notes are written with the express purpose of interesting the members of the Natural History Society of Siam in the study of these fascinating creatures, and of helping to elucidate the life histories of some of the Siamese species.

With few exceptions, luminous insects throughout the world belong, broadly speaking, to one family of Beetles, the *Lampyridae*, or to give them their popular name, the Fireflies and Glow-worms. The most important exception to this statement is afforded by the Fireflies of the West Indies and Central America, locally known as "Cucujos," which, though still Beetles, belong to quite a different family, the *Elatridae* or Skipjacks.

With the *Lampyridae* are associated a few, small, closely allied families at present very insufficiently known and imperfectly characterised, but which from our point of view are of peculiar interest, since it is to this systematically doubtful position that some of the Siamese species belong.

In the *Lampyridae*, the luminous organs are situated in the terminal or subterminal segments of the abdomen, and the light is shown from the under surface. In dead as well as in living specimens, these luminous areas are usually evident by their whitish, opaque, almost waxy appearance, in strong contrast with the generally dark colour of the underside. Though usually present to a greater or lesser degree in both sexes, the luminous property is generally developed much more highly in one sex than in the other. When it is the male beetle that possesses it in the greater degree, the light is shown when the insect is on the wing, and is generally of an intermittent or flashing character, and gives to the insects their popular name of Fireflies.

On the other hand, when the power of luminosity is the more highly developed in the female beetle, the character is usually associated with a more or less complete absence of wings, and the insect becomes merely a crawling, unpleasant-looking, worm-like creature, generally known in fact as a Glow-worm, which nobody who is not an entomologist would ever dream of calling a Beetle. The males of these insects are winged, in form closely resembling the Fireflies, and are totally unlike their spouses. The consequence of this utter dissimilarity between the two sexes of one species is, that it is not easy to co-relate them properly in our collections. Very often we have large numbers of the males of a species, even of whole groups of species or genera, and yet not a single female that we can say definitely belongs to this species or to that. On the other hand we have a considerable number of females of many different species which we are unable at present to assign to their respective males. Some females, for example, that Mr. Gairdner brought home are of great interest as being differently constructed from females of normal *Lampyridae*: evidently they belong to one of the small closely allied families referred to above, but to which species or even genus they should be assigned cannot be determined without a knowledge of the male. We have also in the British Museum collection some larvae from Siam,

also undetermined, which belong apparently to the same species, hence it is very desirable that the male be ascertained and the identity of the species established.

In this case the requisite information may be obtained in various ways, either by rearing the larva and breeding the male beetles from them, or by catching the male beetle when it comes to pair with the living female and forwarding both insects for identification.* Both these methods may require a little patience, but in neither case are the difficulties likely to be insuperable.

As regards the first method, the first step is to be able to distinguish the larva from the perfect female, for the resemblance between the two is very close.

The most ready means of distinction lies perhaps in the legs; in the larva these are short and pointed, almost conical, terminating in a single stout claw, while in the female beetle they are rather longer and more slender, the different sections being articulated at an angle, and the last section, the foot or tarsus, being composed of five (or perhaps only four or three) minute joints, the last of which terminates in two slender claws.

If the specimen found prove to be a larva, it should feed, judging from the analogy of the better known species of this group, on small snails and slugs, and if kept moist with a plentiful supply of food, should complete its transformations without much trouble. A small tin box with a tightly fitting lid, half filled with fine earth, makes a convenient breeding cage, and is easily cleaned and kept free from mould. When full grown the larva will remain quiescent for a few days, lying on its side and taking no food; it will then cast its skin and become a pupa; this is at first white, but gradually becomes darker, the change showing most quickly and most completely in the eyes. If the pupa is to produce a male beetle, the rudiments of wings will now be visible at the sides of the body, but if it is to produce a female beetle there will be hardly any noticeable change from the form of the larva, except in the limbs which now are fixed and motionless. A few days in this state should be sufficient, then the pupa will in turn cast its skin and the perfect beetle emerge.

* In the case of specimens captured *in cop.* particular care should be taken that the pairs are kept together and confusion with other specimens avoided.

If the female beetle has been secured, she should be kept alive and placed in a likely situation, and a watch kept for the males coming to visit her. At the same time it is essential that careful notes should be made of the behaviour of the female and of the arrival of the male. As an indication of what may be expected a brief account of the habits of some of our better known species may not be out of place.

Many members of the Natural History Society of Siam will no doubt be familiar with the common Glow-worm of our English lanes and hedges. The pale greenish lights may sometimes be observed in numbers in the grass by the roadside in June and July. At Lugano this summer they were noticed to be particularly partial to the walls, sitting sometimes 10 or 12 feet from the ground, and in this situation their light would be visible from a long distance. If more closely observed, whether sitting on the ground amongst low vegetation, or hanging vertically on some stem a few inches above it, the light will be seen streaming from the organ on the underside of the tail; the body is twisted first to one side then to the other, in order to expose the light more fully. Often I have carefully noted the position of one of these lights and visited the spot from time to time; at one visit the light has been found to have disappeared, but a careful search of the spot where it should be, has revealed the female beetle with one or more males in close attendance. Unfortunately I have never been able to witness the actual arrival of the male, which in this species is not or but very feebly luminous.

Mr. E. G. Green (1) has published notes on the use of the light of two species of Glow-worm from Ceylon. In one of these, *Lamprophorus tenebrosus*, the apterous female exhibits her light much as does our Glow-worm; the male, though normally brilliant, approaches a "calling" female with the light shut off, its advent being heralded only by the partial extinction of the light of the female. In the other, *Dioptoma adamsi*, the larviform female was observed to recurve the body over the back so as to exhibit the ventral subterminal light organ. On the approach of the male, the light was partially eclipsed and the tail turned down. The male at the time was not known to be luminous, but under the stimulus of sexual excitement it was observed to exhibit luminous spots along the sides of the abdomen

(1) *Trans. Ent. Soc.* 1912, p. 717.

and on the thorax. This is an unusual type of illumination for the *Lampyridae*, but the genus *Dioptoma* is one of those of rather doubtful systematic position to which reference has been made above. To this genus may possibly belong the undetermined Siamese female mentioned earlier, which, Mr. Gairdner informs me, behaved in a very similar manner.

The Fireflies of Southern Europe have been critically observed by Emery (2) and others, and only this summer my friend Mr. Hugh Main and I spent several evenings at Lugano watching the behaviour of *Luciola italica*. In this species and its allies, both sexes are winged, but all the specimens caught on the wing are found to be males. The females closely resemble them, but are rather smaller and less parallel, with the eyes very much smaller in proportion. They are of a more sluggish disposition, and are found lurking in the grass and low herbage. Very soon after sunset the lights of the flying males may be observed sparkling over the grass; as it becomes darker a careful search will probably detect the fainter more continuous light of the female close to the ground. If one of these be kept under observation, the light will be found to disappear at intervals, then to shine again, sometimes continuously, sometimes with a flashing periodicity much slower than that of the male. While the light is shining, a passing male perceiving it will alter his course and fly down, alighting near the female; he then approaches flashing vigorously, as if not quite sure of her exact whereabouts, until he finds her, when the lights of both are extinguished. Even when one male is in attendance the female may start flashing again to attract another, and it is not uncommon to find a small group of males gathered round one female. Though often observed quite early in the evening we frequently noticed that the lights of the females were more numerous and brighter about 10 or 11 p.m. when the lights of the males were becoming scarcer, as though the females, despairing of attracting a mate, were becoming bolder in their efforts. In this species as observed by us, there was no suggestion of the synchronous flashing in concert of large numbers of males that is recorded of another European species as well as of numerous tropical species both of the Old and New Worlds, and which is mentioned by Mr. Gairdner as being very striking in the case of certain Siamese species.

(2) *Bull. Soc. Ent. Ital.* 1886, p. 406.

Of late years much important work has been done by Mr. A. McDermott⁽³⁾ upon North American species of Fireflies. These insects, popularly known as Lightning—bugs, resemble the Fireflies of Southern Europe mentioned above in that the male beetle flies about flashing his light, while the female lurks in the grass below. But whereas in the case for example of the European *L. italica* the female would seem to shew her light on her own initiative to attract the attention of passing males, in the American Lightning-bugs (and also in the European species observed by Emery) the female is more modest, and shews her light only in reply to the "calling" flash of the male. In the United States the number of species is very considerable, and in many cases two or more of them have been found flying together over the same ground, so that specific differences in the light exhibited have been evolved to a high degree. A female of one species will, as a rule, only reply to the flash of a male of her own species, and a searching male will only respond to the answering flash of a female of his own species. Specific differences are found to exist in the periodicity of the flash, in its colour, its duration or in its direction, some species rising and falling with a kind of dancing motion and omitting the flash on the dip or on the rise, etc. Mr. McDermott's investigations were assisted by an ingenious series of experiments with small electric bulbs, which could be operated to simulate the flash of the particular species under observation. A brief summary of some of his results may serve as a guide to similar enquires in other parts of the world.

Photinus pyralis. The flash of the female is given 3 or 4 seconds after that of the male, and is of the same colour but of longer duration and less intense.

Females would answer in numbers to the flash of a match swung in an arc to simulate the flash of a male, though as a rule not more than one female would reply to a flashing male.

A particular female would not reply to the flash of a male of another species (*P. consanguineus*) though she would to that of a match.

The male could also be deceived by a bulb placed in the grass and flashed 3 or 5 seconds after his own flash. When the bulb was flashed without the pause it was not so effective.

(3) *Canad. Ent.* 1910-11-12.

No male was observed to reply to the flash of a creeping male.

P. consanguineus. The male gives a double flash in quick succession followed by a pause, then another flash, and so on; the female replies within a second to the second flash of the male. A particular female would not reply to the flash of a match, but would answer the double flash of a bulb when 20 or 30 feet away; on a nearer approach she seemed to recognise something unusual and would not reply.

P. scintillans. The male gives a short single flash, and the female a longer single flash.

A female would reply to the first flash of a male of *P. consanguineus* but the latter takes no notice. The female of this species is apterous.

P. marginellus. The male gives a single short sharp flash yellower than that of *P. scintillans*: the female replies with a double flash, the first sharper and brighter than the second and followed at once by the second. The reply is given very quickly after the flash of the male.

P. castus. The male gives a single flash not so short and sudden as that of *P. marginellus*; the female gives a single flash very much like that of *P. scintillans* but delivered immediately after the flash of the male; there is no distinct pause as in *P. pyralis* and no indication of doubling as in *P. marginellus*. These last two species are very similar, and indeed by some authorities they have been considered to be merely forms of the same. Mr McDermott admits that he can find no structural difference between them, but their flash is so distinct that he considers them good species. They are frequently found flying together but no case of interbreeding has been observed though specially watched for.

Careful observations of this nature, not only upon Fireflies but upon insects of any sort are very badly wanted. Too often such habits are regarded as merely everyday events of no particular interest, yet outside the particular region in which the species occur very little is known about them. At the same time it is very necessary that the species of which such habits are recorded should be correctly determined; notes on the habits of any animal only vaguely or loosely specified are of little use, hence it is essential, if any observations are to be of scientific value, that specimens should be collected and their identity definitely establi-

shed. It is to be hoped that before long the Society will have its own reference collection of the Siamese fauna, which will greatly facilitate such identifications, but until then specimens may be forwarded for comparison to the National Collection at the Natural History Museum, South Kensington. If at any time I can render any assistance, either in making the necessary comparisons or in other ways, I shall be most happy to place my services at the disposal of the Society, and any material or notes concerning the subject of this paper will be most welcome.



+ CORRECTIONS AND ADDITIONS TO PRELIMINARY LIST OF BANGKOK BIRDS.

BY W. J. F. WILLIAMSON.

Since the publication of the Preliminary List*, I have obtained a number of new species, and have also had the opportunity of submitting to Mr. H. C. Robinson, Director of Museums, Federated Malay States, for identification, specimens of all the birds in my collection with the exception of the Vultures mentioned on p. 47 of the List. As a result a few errors have been discovered, which are set forth below, together with the names of the new species. Of these latter, birds which do not appear to have been previously recorded from Siam are given in heavy type—thus :—**Cisticola volitans**. The figures in brackets are those of the *Fauna of British India*, quoted in the Preliminary List.

DELETIONS.

(363) *Acrocephalus stentoreus*. The Indian Great Reed-Warbler.

(423) *Acanthopneuste plumbeitarsus*. Middenorff's Willow-Warbler.

(611) *Pratincola leucura*. The White-tailed Bush-Chat.

In these three cases the birds proved to be identical with other species already in the List.

CORRECTIONS.

For (307) *Pycnonotus plumosus*, The Large Olive Bulbul, read, (306) *Pycnonotus blanfordi*, Blandford's Bulbul.

For (599) *Tersiphone affinis*, The Burmese Paradise Flycatcher, read, ***Tersiphone incii***, The Chinese Paradise Flycatcher.

For (826) *Motacilla alba*, The White Wagtail, read, (827) *Motacilla leucopsis*, The White-faced Wagtail.

* A Preliminary List of the Birds of Bangkok, *Journal, Nat. Hist. Society of Siam*, Vol. I., No. 1., pp. 41-48.

For (869) *Mirafra cantillans*, The Singing Bush-Lark, read, *Mirafra* sp.

Mr. H. C. Robinson, to whom I have submitted a number of specimens of this bird, is in some doubt as to the species to which it is referable, and advises me, pending the examination of a series by the authorities of the British Museum, to refrain from assigning to it any definite specific name.

For (950) *Gecinus occipitalis*, The Black-naped Green Woodpecker, read, (949) *Gecinus viridanus*, The Burmese Scaly-bellied Green Woodpecker.

For (1081) *Collocalia fuciphaga*, The Indian Edible-nest Swiftlet, read, (1076) *Tachornis infumatus*, The Eastern Palm-Swift.

For (1138) *Palaeornis torquatus*, The Rose-ringed Paroquet, read, (1145) *Palaeornis fasciatus*, The Red-breasted Paroquet.

For 1354 *Excalfactoria chinensis*, The Blue-breasted Quail, read, (1386) *Turnix blanfordi*, The Burmese Button-Quail.*

ADDITIONS.

ORDER—PASSERES.

FAMILY *Crateropodidae*—LAUGHING THRUSHES,

BABLERS, BULBULS, ETC.

(160) *Turdinus abbotti*. Abbott's Babbler.

(-) *Molpastes germaini*. Germain's Indo-Chinese Bulbul.

FAMILY *Sylviidae*—WARBLERS.

⊕ (360) *Locustella certhiola*. Pallas's Grasshopper-Warbler.

(365) *Acrocephalus bistrigiceps*. Schrenck's Reed-Warbler.

⊕ (380) *Cisticola volitans (exilis)* The Golden-headed Fantail-Warbler.

FAMILY *Sturnidae*—STARLINGS AND MYNAS.

⊕ (539) *Sturnia memoricola*. The White-winged Myna.

(549) *Acridotheres tristis*. The Common Myna.

* *Turnix blanfordi* belongs, of course, to a different Order to that under which *Excalfactoria chinensis* is placed, viz, *Hemipodii*—Family, *Turnicidae*.

FAMILY *Ploceidae*—WEAVER BIRDS AND MUNIAS.

- (726) *Munia atricapilla*. The Chestnut-bellied Munia.

FAMILY *Fringillidae*—FINCHES.

- (797) *Emberiza aureola*. The Yellow-breasted Bunting.

FAMILY *Motacillidae*—WAGTAILS AND PIPITS.

- (846) *Anthus striolatus*. Blyth's Pipit.
 †(849) *Anthus cervinus*. The Red-throated Pipit.

FAMILY *Dicaeidae*—FLOWER-PECKERS.

- (922) *Piprisoma modestum*. Hume's Flower-pecker.

ORDER—*PICI*.

FAMILY *Picidae*—WOODPECKERS.

- (983) *Micropternus phaeocephus*. The Northern Rufous Woodpecker.

- (988) *Tiga javanensis*. The Common Golden-backed Three-toed Woodpecker.

ORDER—*ANISODACTYLI*.

FAMILY *Alcedinidae*—KINGFISHERS.

- (1040) *Ceyx tridactyla*. The Indian Three-toed Kingfisher.

FAMILY *Upupidae*—HOOPOES

- (1067) *Upupa indica*. The Indian Hoopoe.

ORDER.—*COCCYGES*.

FAMILY *Cuculidae*—CUCKOOS.

- (1107) *Cuculus micropterus*. The Indian Cuckoo.

ORDER—*STRIGES*.

FAMILY *Asionidae*—OWLS.

- †(1157) *Asio accipitrinus*. The Short-eared Owl.

ORDER—*ACCIPITRES*.

FAMILY *Falconidae*—EAGLES, KITES, FALCONS, ETC.

- (1261) *Falco severus*. The Indian Hobby.
 (1265) *Tinnunculus alaudarius*. The Kestrel.

ORDER—GRALLÆ.

FAMILY *Rallidae*—RAILS.

- + (1402) **Gallinula chloropus.** The Moorhen.

ORDER—LIMICOLÆ.

FAMILY *Parridae*—JACANAS.

- (1428) **Metopidius indicus.** The Bronze-winged Jacana.

FAMILY *Charadriidae*—PLOVERS. SANDPIPERS AND SNIPES.

- (1466) **Totanus glottis.** The Greenshank.
+ (1473) **Tringa subminuta.** The Long-toed Stint.
+ (1474) **Tringa temmincki.** Temminck's Stint.

ORDER—HERODIONES.

FAMILY *Ardeidae*—HERONS.

- (1566) **Ardeola bacchus.** The Chinese Pond-Heron.

The second, third, fourth and fifth birds mentioned in the above Additions belong to Families which have already been dealt with in the Paper on Bangkok Birds which is being published in this *Journal* in parts. These, and any other birds which may similarly be added to the List too late to be taken up in their proper places, will be described at the end of the Paper.



† THE BIRDS OF BANGKOK.

BY W. J. F. WILLIAMSON.

(Continued from Vol. I., No. 2, p. 92).

In the Introduction to the first part of this Paper, which appeared in the previous number of the *Journal*, I gave a list of books and papers to which references would be made. Since then several lists of Birds from Siam (some of them important ones) have made their appearance or are in course of publication, and our knowledge of the geographical distribution of species has, in consequence, been much increased. The following are the lists in question, in chronological order of publication, with the names of their authors:—

- Barton.....C. S. Barton. A short List of Birds from the Raheng District. Vol. I, No. 2, pp. 105-109 of this *Journal*.
- Robinson.....H. C. Robinson. On a collection of Birds from the Siamese Province of Bandon, N. E. Malay Peninsula. *Journal of the Fed. Malay States Museums*. Vol. V, No. 3, pp. 83-110.
- Robinson.....H. C. Robinson. The Zoology of Koh Samui and Koh Pennan—Birds. *Journal of the Fed. Malay States Museums*. Vol. V, No. 3, pp. 139-152.
- Gairdner.....K. G. Gairdner. List of Mammals and Birds, obtained in the Ratburi and Petchaburi Districts. Present number of this *Journal*, pp. 148-153.
- Gyldenstolpe.....Count Nils Gyldenstolpe. List of birds collected by Mr. Emil Eisenhofer in Northern Siam. Part 1, Order *Passerres*, present number of this *Journal*, pp. 163-172. Remaining Orders to follow in Vol. I, No. 4.

In order to distinguish the last-named List from that of Gyldenstolpe's own collection, previously quoted in the Introduction to this Paper, Mr. Eisenhofer's name will be given, in conjunction with that of Count Gyldenstolpe, for each species referred to. In all other cases the names of the authors alone will be quoted.

Family *ORIOOLIDÆ*—Orioles.

+ 26 (514). *Oriolus indicus*. *The Black-naped Oriole*.

Siamese, นกขมิ้นเหลืองอ่อน (Nok khamin luang-on).

Description. Length about 267 mm. (10.5 in). *Male.* Whole head and body bright yellow, except the lores and a band through each eye broadening and meeting across the nape, which are black; primaries and secondaries black, tipped and edged with yellowish white; outer webs of tertiaries yellow; inner webs black; primary coverts black tipped with yellow; middle pair of tail feathers black narrowly tipped with yellow, the others progressively more yellow at the ends. *Female.* Similar colouration, except that the back is slightly greenish.

Iris pink (Oates). Bill pinkish white. Legs plumbeous.

Young birds are yellowish green above, paler on the rump; throat, breast and centre of abdomen whitish streaked with brown; flanks, under wing-coverts and under tail-coverts yellow with greenish tinge. Quills and tail feathers brownish where the adults have black. Iris brown. Bill dark horny to pinkish brown—the basal half of the lower mandible being paler. Legs as in adults.

Habits, etc. This beautiful and striking bird is a fairly common cold weather visitor, occurring (as far as my observation goes) from October to April. Adults have rich flute-like note, but young birds (which are the more plentiful) utter a harsh call of *chē-eh*. Orioles are of strictly arboreal habit, and feed on fruit as well as the insects to be found on trees.

Distribution. Also recorded from Trang by Robinson and Kloss, who state that they found it "fairly abundant" during December and January; from the Ratburi and Petchaburi Monthons by Gairdner; and from Northern Siam by Mr. Emil Eisenhofer (Gyldenstolpe).

+ 27 (521). **Oriolus melanocephalus.** *The Indian Black-headed Oriole.*

Siamese, นก ขันนํ้า เหลือง ค้อน (Nok khamin liang-on).

Description. Length, up to 241 mm. (9.5. in.). *Male.* Head, neck, chin and throat black; remainder of body rich yellow; primary coverts black with yellow tips; quills black, all but the first primary with yellowish tips which become successively larger on the secondaries and tertiaries; tail yellow, except the middle pair of feathers which are black on their terminal half, with a yellow tipping, and the next two pairs which are partly black. *Female.* As above, but the yellow of the breast and back is duller, with sometimes a greenish tinge.

Iris crimson. Bill pinkish. Mouth flesh-colour. Legs plumbeous.

In young birds the yellow parts are greenish, and the black parts brownish to brownish black, except the chin and throat which are whitish with dark brown stripes—traces of the stripes being also visible on the breast. The iris is brown to reddish brown, and the bill blackish brown.

Habits etc. Similar to those of the last species.

Distribution. So far as Bangkok is concerned this appears to be a rare bird, as I have only obtained a single specimen, an immature male, which I shot in my garden in February 1914. It appears, however, to be common almost throughout the country, as it is recorded by Gyldenstolpe from Eastern, Central and Northern Siam, while Robinson and Kloss state that they obtained a pair in Pulau Lankawi (an island off the coast of Kedah, at that time under Siamese protection), but apparently did not meet with it on the mainland, in Trang. It is also reported from the Ratburi and Petchaburi Monthons by Gairdner, and I have obtained it both at Koh Lak and at Sriracha in November and December.

Family. *STURNIDAE*—Starlings and Mynas.

+ 28 (536), **Sturnia sinensis.** *The Chinese Myna.*

Description. Length, up to 203 mm. (8 in.). Forehead whitish with a ferruginous tinge; chin whitish; rest of body grey, darkest on back and paling almost to white on lower part of abdomen, the flanks and upper tail-coverts sometimes with a ferruginous tinge; wing-coverts white, slightly tinged with ferrugi-

nous; quills black, the tertiaries and tips of the other feathers suffused with metallic blue and lilac; tail black with metallic blue gloss, the middle pair of feathers narrowly, the others more broadly, tipped sullied ferruginous white.

Iris greyish white to white. Bill slatey blue. Legs plumbeous.

Immature birds are darker grey on the body, and lack the conspicuous patch formed by the white wing-coverts of adults.

Habits, etc. A common cold weather visitor, occurring here in great numbers from September to February, after which the majority of the birds depart, though some linger on until April. They invariably go about in flocks numbering from three or four up to thirty or forty, and are a familiar and striking object, with their distinctive grey and white plumage, as they fly past rapidly in company, or settle on some tree to search for their food. This consists of insects and the nectar from flowers.

Oates states that the few specimens of this bird which he procured in Pegu were feeding on the ground, but in Bangkok, where they occur in large numbers, I have always found them strictly arboreal, and while searching for their food they move along the branches and twigs with a peculiar creeping motion. The note of this bird is a harsh, but not loud, double *chick-chick*.

I have been unable to get any satisfactory Siamese name for this bird, though it appears to bear several.

Distribution. Also recorded from the Monthons of Ratburi and Petchaburi (Gairdner).

† *29 (539). ***Sturnia memoricola.*** *The White-winged Myna.*

Description. Length about 203 mm. (8 in.) Upper plumage grey, darker on the back—the feathers of the head and neck having whitish shafts and those of the rump and upper tail-coverts being tinged with ferruginous; quills blackish, all the feathers being tipped and edged with grey, the edging becoming broader on the secondaries and tertiaries; edge of wing white; middle pair of tail-feathers grey with black shafts, the others dark brown at the base and tipped with ferruginous. Chin, throat and upper breast greyish white to ferruginous grey, the breast feathers with white shafts; remainder of lower plumage ferruginous white to deep ferruginous.

Iris dull white. Bill, anterior half yellow, basal half plumbeous—the culmen greenish. Legs pinkish flesh-colour.

Distribution. I obtained a pair of these birds from a Siamese bird-catcher in Bangkok in December 1914. He assured me he had trapped them here, and that in the course of a season he gets as many as 40 or 50. I have no reason to doubt this statement, as the man appears to devote himself to the business of catching birds in Bangkok and selling them either to private individuals or to the proprietors of the numerous bird shops here.

I can trace no other record of this bird in Siam. Mr. Emil Eisenhofer (Gyldenstolpe) records *S. malabarica* from Northern Siam, and though the two species are very similar in appearance, *S. memoricola* can be distinguished by the white edge to its wing which is entirely lacking in *S. malabarica*. The identification of my specimens has been confirmed by Mr. H. C. Robinson.

† 30 (546). **Graculipica nigricollis.** *The Black-necked Myna.*

Siamese, นกเขียงโครงใหญ่ (Nok iang-khrōng yai).*

Description. Length, up to 304 mm. (12 in). Whole head and neck white, bordered all round by a black collar; behind this, on the back, is an indistinct band of feathers with whitish tips, while the remainder of the back is dark brown, the feathers with paler tips; rump and shorter tail-coverts white, primary wing coverts white; remaining wing-coverts and quills dark brown with white tips—minute on the primaries. Lower plumage, with the exception of the black collar, white.

Iris rich dark brown, surrounded by a narrow ring dull white. Bill dark horny. Mouth dark slate to blackish. Legs dull fleshy white. Bare skin round the eyes pale to deep yellow. Young birds have the head and neck brown.

Habits, etc. One of our commonest resident birds, usually going about in pairs or small flocks, and frequently to be seen walking about on the ground searching for insects, of which its food appears chiefly to consist. This Myna is a very noisy bird and has a number of loud and cheerful but not unmusical notes. Being of a gregarious nature, it usually roosts, out of the breeding season, in considerable companies, selecting some leafy tree or bamboo clump for the purpose.

* Colloquially known as *Nok iang-khrong yai*.

The noise the birds then make, for half an hour or so before dark, is almost deafening.

Distribution. Probably to be found over the greater part of the country, as it is also recorded by Gyldenstolpe from Eastern, Northern and Central Siam, and by Gairdner from the Provinces of Ratburi and Petchaburi. I have found it common both at Koh Lak and at various places on the east coast of the Gulf of Siam.

† * 31 (549). *Acridotheres tristis.* *The Common Myna.*

Siamese. นกสามิตกา (Nok sālika).

Description. Length 254 mm. (10 in). Upper portion of head and neck glossy black, succeeded by a band of dull greyish black, fading into the vinous brown of the back and the paler brown of the rump and upper tail-coverts; primary wing-coverts white; other wing-coverts and tertiaries vinous brown; primaries black with white bases; tail feathers blackish, tipped with white. Lower neck and breast dull black, passing into the vinous brown of the abdomen and flanks; under tail-coverts white.

Iris reddish brown. Bill, bare facial skin and legs yellow. Mouth blackish purple.

Habits, etc. Largely a ground-bird feeding on insects, and of a gregarious and sociable character.

Distribution. So far as regards Bangkok, this bird appears to be somewhat of a rarity as I have only obtained specimens on three occasions, in February, March and October. Mr. E. W. Trotter, however, informs me that he found it common in December at Klong Rangsit (only 12 miles due north of Bangkok) whence he sent me a specimen. Outside Bangkok I have obtained the bird at Koh Lak, and also observed it at Paknampo, while Gairdner records it from the Provinces of Ratburi and Petchaburi, and Barton from Raheng in Northern Siam.

† 32 (553). *Æthiopsar grandis.* *The Siamese Myna.*

Siamese, นกเขียงดำ (Nok iang dam).

Description. Length up to 254 mm. (10 in). Body plumage black—the lower parts with a brownish tinge and the under tail-coverts

white; primaries black, with a large white patch near their bases, and all the wing feathers more or less glossed with bronze; tail black, broadly tipped with white.

Iris reddish brown. Bill orange yellow, paler at tip. Legs pale orange-yellow to dusky yellow.

Habits, etc. A fairly common resident species, occurring in pairs or small flocks, and easily recognised by its narrow frontal plumes, 18 mm. (.75 in.) long, rising from the forehead and curling backwards. It is frequently to be seen perched on the backs of Water Buffaloes, picking off and eating the ticks on those animals.

Distribution. Also recorded from Eastern and Northern Siam by Gyldenstolpe who describes it as "very common everywhere in favourable localities." Outside Bangkok I have obtained it at Koh Lak, while Gairdner records it from the Provinces of Ratburi and Petchaburi.

33 (556). **Sturnopastor superciliaris.** *The Burmese Pied Myna.*

Siamese, นกเขยง ไกรง เต็ก (Nok iang-khrōng lek).*

Description. Length, up to 241 mm. (9.5 in). Forehead and crown black, closely streaked with white; patch behind eye white; chin, throat, upper breast, neck (all round) and back glossy black; lower rump white; edge of wing, lesser wing-coverts and edges of inner median wing-coverts white. Lower plumage from middle breast downwards white, with pale vinaceous tinge; under wing-coverts white.

Iris pale yellow to yellowish buff. Bill, basal half deep orange to orange-red, remainder dull white. Mouth black. Orbital skin orange-yellow to orange. Legs, dull whitish to dusky flesh.

Young birds have the bill and legs more or less dusky brown.

Habits, etc. This is also a common and familiar resident species. Like other Mynas it feeds mainly on the ground, on insects, and possesses a variety of loud, vivacious notes. It is generally to be seen in pairs or small flocks, but sometimes large numbers congregate together.

Distribution. Also recorded from Eastern and Central Siam by Gyldenstolpe under the name of *S. floweri*, which appears to be a

* Colloquially known as *Nok king-khrōng lek*.

geographical race of *S. superciliaris*; from Northern Siam by Mr. Emil Eisenhofer (Gyldenstøpe); and from the Ratburi and Petchaburi Monthons by Gairdner. I have likewise met with the bird at Koh Lak and at various places on the East coast of the Gulf of Siam as far south as Chantabun.

Family *MUSCICAPIDÆ*.—Flycatchers.

+ 34 (562). *Siphia albicilla*. *The Eastern Red-breasted Flycatcher*.

Description. Length about 127 mm. (5 in). General colour of upper parts fulvous brown, darker on the head, and with upper tail-coverts black; quills brown, the primaries very narrowly, the other wing-feathers more broadly, edged paler; the two middle pair of tail-feathers wholly blackish, the others with the basal half or more white. Chin and throat chestnut in the male, ashy white in the female; remainder of lower plumage ashy white.

Iris dark brown. Bill dark brown, except base of lower mandible which is brownish flesh. Mouth dull yellow. Legs and feet dark brown to blackish.

Habits, etc. This bird is a cold weather visitor to Siam and occurs in Bangkok from October to February, though not, I think, in any large numbers. It is of an active and wary disposition, and usually flits away as one approaches, the while uttering its grating little note, *chr-r-r*, which is unmistakable. It usually keeps to low trees and bushes, hunting for small insects, but I have observed it descend to the ground for that purpose—flitting back again to a convenient perch near by, as soon as the insect has been captured.

Distribution. Also recorded from Northern Siam (Gyldenstøpe), while I have likewise obtained it at Sriracha in December.

+ 35 579). *Stoparola melanops*. *The Verditer Flycatcher*.

Description. Length up to 165 mm. (6.5 in). *Male*. Whole plumage verditer-blue, with the exception of the lores, feathers in front of the eye and those at the base of the lower mandible, which are black; all wing-feathers black on inner webs; tail blue, the shafts black and the inner webs edged with blackish brown. Under tail-coverts fringed with white. *Female*. Very similar to male, but the blue of the body-plumage is duller, the lores are brown, and the chin and throat are whitish.

Iris dark brown. Bill and legs black. Mouth flesh-colour to dusky flesh.

Habits, etc. A cold weather visitor to Bangkok, occurring here somewhat sparingly from October or November to February. As far as my observations go, it usually keeps well up in trees, preferably large ones, though I have on two occasions shot the bird while perched on the top of a small tree in a clearing. It takes its prey (small insects) in the true flycatcher manner, by darting on it in the air from its perch, to which it returns to devour its capture. I have never seen one on the ground.

Distribution. Outside Bangkok I have obtained this bird at Sriracha in December, while Gyldenstolpe also records it from Northern Siam where he found it "rather rare."

+ 36. (588). **Aleonax latirostris.** *The Brown Flycatcher.*

Description. Length about 127 mm (5 in.). Upper plumage ashy brown, darker on the head and paler on the rump and upper tail-coverts; tail dark brown, the outer feathers very narrowly tipped with whitish; quills dark brown, all but the primaries edged with ashy white, more broadly on those nearer the body; lores and a ring round the eye whitish. Lower plumage ashy white.

Irish brown. Bill very dark brown, except base of lower mandible which is dull yellow. Mouth yellow. Legs blackish.

Habits, etc. This is also a seasonal visitor to Bangkok, occurring from August to February or later. It has the usual flycatcher habits, and takes its prey in the air by a short dart from a perch. I have not found the bird at all common here.

Distribution. Appears to be widely distributed, as it is also recorded from Trang by Robinson and Kloss, and from Northern Siam by Mr. Emil Eisenhofer (Gyldenstolpe), while I obtained a specimen at Sriracha in October.

+ *37 (—). **Tersiphone incii.** *The Chinese Paradise Flycatcher.*

Description. † *Male.* Length 222 mm. (8.75 in.). Head and neck all round black, richly glossed with blue; remainder of upper plumage rich chestnut, the tail paler chestnut; primaries and second-

† The description here given is taken from the two specimens in my collection, and is not necessarily of general application.

aries brown, edged with chestnut; tertiaries wholly chestnut, with black shafts. Lower plumage, from breast to middle of abdomen, grey, paling to whitish on lower abdomen; lower tail-coverts white, with rufous tinge. *Female*. Somewhat similar to male, but smaller in size (190 mm. or 7.5 in.), the chestnut of the upper plumage paler and the grey of the lower plumage darker.

Distribution. There appears to be no previous record of this species in Siam. I obtained two specimens in my garden, one in 1913 (? July or September) and other in September 1914, and both have been identified by Mr. H. C. Robinson. *T. incii* is a Chinese form which extends into the Malay Peninsula as a winter visitor (Robinson, *A Handlist of the Birds of the Malay Peninsula, South of the Isthmus of Kra*, 1910, p. 13), so it would appear that the birds procured here by me were on migration. If this be the case, individuals ought also to be obtained at the end of the cold weather, on their return journey eastwards.

† 38 (601). **Hypothymis azurea.** *The Indian Black-naped Flycatcher.*

Description. Length about 165 mm. (6.5 in.), *Male*. Head and neck all round azure blue, except a patch on the nape, the extreme edge of the forehead and a narrow crescentic bar across the base of the neck below, which are black; remainder of upper plumage duller blue; wings dark brown, edged with blue; tail brown, suffused with blue on the median pair of feathers and on the outer webs of the others. Breast blue, shading off into white on abdomen and under tail-coverts. *Female*. Head and neck all round dull blue; back, wings, rump, upper tail-coverts and tail brown, the outer webs of the quills and the middle tail-feathers faintly washed with blue. Breast ashy blue; abdomen and under tail-coverts dull white, the flanks grey.

Iris dark brown. Bill very dark blue. Mouth greenish yellow. Legs bluish plumbeous to dark blue.

Habits, etc. A cold weather visitor to Bangkok, where it appears to occur from October to February, though it is not common. Its habits are similar to those of the other flycatchers, *i. e.*, it feeds on small insects which it takes in the air by a sudden dart from a perch. As far as my experience goes, the bird is a frequenter of dark undergrowth in well-wooded tracts, and avoids open country and high trees.

It is consequently only to be met with, as a rule, in a few suitable localities in the outskirts of Bangkok.

Distribution. Apparently widely distributed, as it is also recorded from Trang (Robinson and Kloss); from Northern Siam (Gyldensolpe); and from the Ratburi and Petchaburi Monthons (Gairdner); while I have obtained it on the East coast of the Gulf of Siam in October.

† 39 (606). **Rhipidura javanica.** *The Java Fantail Flycatcher.*

Siamese, นก ทราบ พนม (Nok hāng p'hēn).

Description. Length up to 190 mm. (7.5. in). *Male.* Forehead, crown and sides of head sooty brown; the remainder of the upper plumage (including wings) brown, suffused with rufous; tail dark brown, the four outer pairs of tail-feathers broadly, the pair next to them narrowly, tipped with white; a short and half-concealed supercilium pure white. Chin, a band across the breast, and the sides of the breast blackish brown; remainder of lower plumage white, tinged with buff. *Female.* Somewhat smaller, upper plumage rather duller, and lower plumage more buff than the male.

Iris dark brown. Bill black, base of lower mandible dusky flesh-colour. Legs blackish brown to black, the soles dusky greenish flesh-colour.

Habits, etc. A permanent resident in Bangkok, and one of the commonest birds in our gardens, where its liveliness and its habit of flirting and dancing about with outspread tail (hence its name of Fantail Flycatcher) and half-opened wings, make it a most noticeable and attractive little bird. Its note is a joyous one, usually of five rather slowly drawn-out syllables, *cheech che-wesch che-wēech*.

The food of this bird consists, of course, of insects, which it pursues and seizes in the air, in the usual flycatcher manner, by darting at it from a branch, but the Java Fantail Flycatcher is also frequently to be seen on the ground dancing along with outstretched tail and wings in the manner above described.

Distribution. Apart from Bangkok, this bird appears, so far, to have been recorded only by Gairdner from the Provinces of Ratburi and Petchaburi, but I have met with it at Sriracha, Ayuthia and Koh Lak, at both of which last-named places I found it common.

(To be continued).

LIST OF THE SNAKES AT PRESENT KNOWN TO INHABIT SIAM.

BY MALCOLM SMITH, M.R.C.S., L.R.C.P.

Since Captain Flower published his paper upon the Reptiles of the Malay Peninsula and Siam, (*Proc. Zool. Soc. London, 1899*, pp. 600—696) no work of any kind has appeared dealing with the snakes of this country. His paper, moreover, as far as Siam is concerned, is obscured by the fact that the two regions to which he refers are taken together instead of separately, and without going through it in detail it is impossible to see what actually belongs to each country.

A great many species have been added since that time, particularly in the last two years by the members of our Society, and I therefore take this opportunity of publishing a new list, complete, as far as possible, up to date.

The recently issued volume upon the Reptiles and Batrachians of the Malay Peninsula, sets the northern limit of that region at the Isthmus of Kra, thus including a portion of Siam. A certain amount of overlapping in the lists of the species of the two countries is therefore inevitable, and in order to avoid confusion I have adhered to that boundary, and have noted, with regard to all species added since Flower's time, whether they were obtained North or South of that line.

Flower's original paper contained 57 species from Siam. In the present list they have no mark attached to them.

Various expeditions to the Siamese Malay States, particularly one by Messrs. Robinson and Annandale to Patani in 1903 (*Fasciculi Malayenses, Zoology, Vol. 1, pp. 131-176*), have added another 16 to that number. These are marked with a †

25 more may now be included, bringing the total number of species up to 98. Those obtained North of the Isthmus of Kra are marked with a *, those South of it with a §

I should like here to express my sincere thanks to the following lady and gentlemen who have kindly collected for me in various parts of the country, and to whom I am indebted for many valuable specimens:—Mrs. Collins, Messrs. C. J. Aagaard, P. A. R. Barron, C. S. Barton, T. S. Butler, T. B. Chatteris, W. N. Dunn, G. Weston Elwes, K. G. Gairdner, S. H. Greene, E. G. Herbert, J. F. Keddie, T. H. Lyle, H. Lover, J. Miller, T. A. Slack, Sorabjee, and H. C. St. J. Yates.

FAMILY TYPHLOPIDÆ.

1. TYPHLOPS BRAMINUS, *Daud.*
2. T. SIAMENSIS, *Guthr.*
3. T. SCHNEIDERI, *Jan.*
4. T. FLOWERI, *Blgr.*
5. T. ALBICEPS, *Blgr.*
- † * 6. T. NIGROALBUS, *Dum. and Bibr.*
- § 7. T. LINEATUS, *Boie.*

FAMILY BOIDÆ.

8. PYTHON RETICULATUS, *Schneid.*
- * 9. P. MOLURUS, *Linn.*

FAMILY ILYSIIDÆ

10. CYLINDROPHIS RUFUS, *Laur.*

FAMILY XENOPELTIDÆ.

11. XENOPELTIS UNICOLOR, *Reinw.*

FAMILY COLUBRIDÆ.

ACROCHORDINÆ.

12. ACROCHORDUS JAVANICUS, *Hornstedt.*
13. CHERSYDRUS GRANULATUS, *Schneid.*

COLUBRINÆ.

14. POLYODONTOPHIS GEMINATUS, *Boie.*
- * 15. P. COLLARIS, *Gray.*
16. PRYMNOMIODON CHALCEUS, *Cope.*
- † 17. MACROPISTODON RHODOMELOS, *Boie.*
18. TROPIDONOTUS PISCATOR, *Schneid.*

19. T. TIGRINUS, *Boie*.
 * 20. T. STOLATUS, *Linn.*
 21. T. SUBMINIATUS, *Schleg.*
 † * 22. T. CHRYSARGUS, *Schleg.*
 * 23. T. NIGROCINCTUS, *Blyth.*
 24. LYCODON AULICUS, *Linn.*
 25. L. LAOENSIS, *Gnthr.*
 * 26. L. FASCIATUS, *Anders.*
 § 27. L. SUBCINCTUS, *Boie.*
 * 28. TRIRHINOPOLIS NUCHALIS, *Blyr.*
 * 29. PSAMMOPHIS CONDANARUS, *Merr.*
 30. DRYOCALAMUS DAVISONII, *Blanf.*
 31. ZAMENIS MUCOSUS, *Linn.*
 32. ZAMENIS KORROS, *Schleg.*
 33. Z. SPINALIS, *Peters.*
 34. COLUBER TAENIURUS, *Cope.*
 35. C. RADIATUS, *Schleg.*
 * 36. C. OXYCEPHALUS, *Boie.*
 37. DENDROPHIS PICTUS, *Gmel.*
 * 38. D. FORMOSUS, *Boie.*
 * 39. DENDRALAPHIS SUBOCULARIS, *Blyr.*
 § 40. D. CAUDOLINEATUS, *Gray.*
 41. SIMOTES PURPURASCENS, *Schleg.*
 42. S. CYCLURUS, *Cantor.*
 43. S. TAENIATUS, *Gnthr.*
 * 44. S. VIOLACEUS, *Cant.*
 * 45. S. INORNATUS, *Blgr.*
 * 46. ALABES SCRIPTUS, *Theob.*
 47. CALAMARIA PAVIMENTATA, *Dum. and Bibi.*

HOMALOPSINÆ.

48. HYPsirHINA PLUMBEA, *Boie.*
 49. H. JAGORII, *Peters.*
 * 50. H. SMITHII, *Blgr.*
 51. H. ENHYDRIS, *Schneid.*
 52. H. BOCOURTI, *Jan.*
 53. H. CHINENSIS, *Gray.*
 54. HOMALOPSIS BUCCATA, *Linn.*
 † * 55. CERBERUS RHYNCHOPS, *Schneid.*

56. HIPISTES HYDRINUS, *Cantor*.
 57. HERPETON TENTACULATUM, *Jacép.*

DIPSADOMORPHINÆ.

58. DIPSADOMORPHUS MULTIMACULATUS, *Boie*.
 * 59. D. HEXAGONATUS, *Blyth*.
 * 60. D. CYANEUS, *Dum. and Bibr.*
 † * 61. D. CYNODON, *Boie*.
 † 62. D. DENDROPHILUS, *Boie*.
 † 63. D. NIGRICEPS, *Guthr.*
 64. PSAMMODYNASTES PULVERULENTUS, *Boie*.
 65. DRYOPHIS MYCTERIZANS, *Linn.*
 † * 66. D. PRASINUS, *Boie*.
 67. DRYOPHIOPS RUBESCENS, *Gray*.
 68. CHRYSOPELEA ORNATA, *Shaw*.

HYDROPHINÆ.

69. HYDRUS PLATURUS, *Linn.*
 70. HYDROPHIS ORNATUS, *Gray*.
 † 71. H. JERDONII, *Gray*.
 * 72. H. VIPERINA, *Schmidt*.
 † 73. H. NIGROCINCTUS, *Daud.*
 74. H. DIADEMA, *Guthr.*
 75. H. FASCIATUS, *Schneid.*
 † 76. H. CAERULESCENS, *Shaw*.
 * 77. H. TUBERCULATUS, *Anders.*
 † 78. H. GRACILIS, *Shaw*.
 * 79. H. KLOSSI, *Blgr.*
 80. ENHYDRIS HARDWICKII, *Gray*.
 81. ENHYDRINA VALAKADIEN, *Boie*.
 † 82. THALASSOPHIS ANNANDALII *Laidlaw*.
 83. PLATURUS LATICAUDATUS, *Linn.*

ELAPINÆ.

84. BUNGARUS FASCIATUS, *Schneid.*
 * 85. B. CANDIDUS, *Linn.*
 86. NAIA TRIPUDIANS, *Merr.*
 87. N. BUNGARUS, *Schleg.*
 * 88. CALLOPHIS MACULICEPS, *Guthr.*

† 89. DOLIOPHIS BIVIRGATUS, *Boie*.

† 90. D. INTESTINALIS, *Laur*.

FAMILY AMBLYCEPHALIDÆ.

† 91. HAPLOPELTURA BOA, *Boie*.

92. AMBLYCEPHALUS MOLLENDORFII, *Boettg*.

§ * 93. A. CARINATUS, *Boie*.

94. A. MARGARITOPHORUS, *Jan*.

FAMILY VIPERIDÆ.

95. VIPERA RUSSELLII, *Shaw*.

96. ANCISTRODON RHODOSTOMA, *Boie*.

97. A. BLOMHOFII, *Boie*.

98. LACHESIS GRAMINEUS, *Shaw*.

AN APPEAL FOR LANGURS.

The following appeal is made to all those interested in the Mammalian fauna of Siam, for specimens, and notes on the habits, of the Langur Monkeys. The Siamese Langurs are very little known and the material at present to hand is not sufficient to permit of a thorough understanding of the relations existing between the various forms.

In the preparation of skins it should be remembered that the measurements and sex of each animal should be recorded on the label. The usual body measurements are (1) from the tip of the nose to the base of the tail; (2) from the base of the tail to the tip of same—not including any terminal tuft of hairs; and (3) the length of the hind foot.

The skulls of the various specimens should all be labelled so that they can be identified with the skins that belong to them; for this purpose the collector will find it easiest to number his specimens and never to repeat the same numbers in any subsequent collection. The skulls are best if sent home with the dried meat still on, as this prevents damage and loss of teeth. The localities of the specimens should be recorded on the label in such a manner that those less intimately acquainted with the local geography may be able to locate the various places. The altitude and date of capture are also items of considerable importance which should be entered upon the skin label.

As far as possible specimens of both sexes should be obtained, together with young individuals—so that any sexual or juvenile pelage-differences may be observed.

It is hoped shortly to publish an extensive monograph on the subject of the Langur Monkeys.

The Indian groups are now, thanks to the Bombay Natural History Society's mammal survey, well worked out; to bring our knowledge concerning the Siamese forms up to the same standard we require a much more complete series than is now available for examination.

GUY DOLLMAN,

British Museum (Natural History).

October 23, 1914.

PROCEEDINGS OF GENERAL MEETINGS.

3RD ORDINARY GENERAL MEETING, 1914.

This meeting was held at Mr. W. L. Grut's house on the 12th November, 1914, and was attended by 14 members and 2 guests. Mr. W. J. F. Williamson presided.

A large and interesting collection of birds and mammals made by Count Gyldenstolpe during the months of March to November 1914, in the North of Siam, was exhibited by him. During this period some 750 birds (comprising 259 species) and 100 mammals, besides a number of reptiles, fishes, intestinal worms, beetles and spiders were collected.

Among the birds were the following which had not previously been recorded from Siam :—

Pomatorrhinus tickelli, *Gampsonychus torquatus*, *Drymocathartes (Dryocataptes) tickelli*, *Corythoichla brevicaudata*, *Stachyridopsis rufifrons*, *Herpornis xantholeuca*, *Chloropsis hardwickii*, *Rhipidura albicollis*, *Aethopyga dabryi*, *Dicaeum ignipictus*, *Pyrhopicus pyrrhotis*, *Picumnus immomitatatus*, *Sasia ochracea*, *Megalaema marshallorum*, *Megalaema virens*, *Cyanops davisoni*, *Cyanops asiatica*, *Cyanops ramsayi*, *Huhua nepalensis*, *Photodilus badius*, *Polioaëtus ichthyaëtus*, *Sphenocercus apicauda* and *Macropygia tusalia*.

At the conclusion of the exhibition Mr. T. H. Lyle, in congratulating Count Gyldenstolpe on his collection, made some interesting remarks on the difficulties to be experienced while collecting specimens in the country through which Count Gyldenstolpe had travelled:

A hearty vote of thanks to Count Gyldenstolpe, proposed by Mr. Williamson, terminated the proceedings.

1ST ORDINARY GENERAL MEETING, 1915.

This meeting was held at the Oriental Hotel on the 21st January, 1915, Dr. Malcolm Smith, the Vice-President, being in the chair.

Mr. C. Boden Kloss, Assistant Director of Museums, Federated Malay States, exhibited specimens of mammals and birds collected by him on a few weeks' trip, during December 1914 and January 1915, on the islands off the East coast of the Gulf of Siam and the adjacent mainland. The collection consisted of nearly 500 mammals and some

400 birds, a large part of the former being rodents. A feature of the display was the fine condition of the specimens and the excellent manner in which they had been preserved.

The method of wrapping up the birds and pinning out the mammals was shown, and Mr. Kloss also exhibited some of his collecting guns and traps. He further made some interesting observations on the differences in colouration and markings of specimens from the mainland as compared with those obtained on the adjacent islands. Mr. Kloss also showed photographs of the various camps and other places visited.

A very interesting meeting was brought to a close by a vote of thanks which was heartily accorded to Mr. Kloss, on the proposition of Dr. Malcolm Smith.

2ND ANNUAL GENERAL MEETING.

The Second Annual General Meeting of the Society was held at the office of the *Bangkok Times* on the 26th February 1915. There were present 12 members and 3 guests, with the President, Mr. W. J. F. Williamson, in the chair.

The President stated that during the past year 20 new members had joined and 2 honorary members had been elected. There were 10 resignations during the year, leaving a membership of 75 at the end of 1914, against 63 twelve months previously.

A list of the meetings held during the year and of the publications that had been presented to the Society, as well as a list of the other Societies and Institutions to which the *Journal* was being sent, was also read out by Mr. Williamson.

The Honorary Secretary having read a statement of accounts for the year, showing a balance in hand at the end of 1914 of Tcs. 660.94, a proposal to adopt them, made by Mr. Williamson, was carried. A proposition moved by Mr. J. J. McBeth and seconded by Mr. W. L. Grut, that the officers and Committee of 1914 be elected *en bloc* for 1915, was carried.

The Committee thus re-elected was comprised as follows:—

President, Mr. W. J. F. Williamson; *Vice-President*, Dr. Malcolm Smith; *Hon. Secretary and Treasurer*, Mr. S. H. Cole; and Messrs. E. J. Godfrey, E. G. Herbert and H. Rieschick.

It was next proposed by Mr. J. R. C. Lyons and seconded by Mr. W. Nunn that Dr. Malcolm Smith and Mr. W. J. F. Williamson be re-elected Editors of the *Journal*. This was carried, and on the proposal of Mr. W. L. Grut, seconded by Mr. E. G. Herbert, a vote of thanks was accorded to the Editors for their work in getting out the Society's *Journal*.

This closing the business in connection with the Annual General Meeting, the minutes of the last Ordinary General Meeting were read and approved. Dr. Malcolm Smith then proceeded to exhibit specimens of some of the reptiles collected by Mr. C. Boden Kloss during his recent trip to the East Coast of the Gulf of Siam, and stated that a full account of this collection would be published in the *Journal*.

Mr. Williamson exhibited a fine specimen of the Spotted-billed Pelican (*Pelicanus philippensis*) shot at Singora by Mr. C. J. Aagaard, while Mr. J. J. McBeth showed some specimens of a species of leaf insect obtained near Korat. Mr. W. Nunn also exhibited the bills of an adult male and a younger female of the Indo-Burmese Pied Hornbill (*Anthracoceros albirostris*) shot on the South-East Coast by a non-member of the Society.

STATEMENT OF ACCOUNTS FOR THE YEAR 1914.

INCOME.		EXPENDITURE.	
	Ticals.		Ticals.
Balance brought over from 1913 ...	213.55	Postage	40.89
Subscriptions for 1914	1420.00	Stationery and Account Books	10.00
Arrears subscriptions for 1913 paid in 1914	20.00	Almirah for storing publications ...	40.00
Subscriptions for 1915 paid in 1914 ...	115.00	Printing & other ex- penses in connec- tion with the issue of the 1st Number of the <i>Journal</i>	422.59
Interest on balance at Bank ...	7.58	Ditto, ditto, for the 2nd Number ...	559.26
		Printing Rules, Notices, etc. ...	46.45
		Balance at Bank at end of 1914 ...	656.94
	Tcs. <u>1776.13</u>		Tcs. <u>1776.13</u>

Bangkok,

24th February 1915.

(Sd) S. H. COLE.

Hon. Secretary and Treasurer.

LIST OF MEMBERS ON 31ST DECEMBER, 1914.

- | | |
|---------------------|--------------------------------|
| Aagaard, C. J. | Lucius, Dr. R. |
| Bain, W. | Lupsa, F. |
| Barron, P. A. R. | Lyons, J. R. C. |
| Barton, C. S. | Mannsfeldt, M. |
| Bonnafous, H. | Massey, H. E. |
| Boyce, E. B. | McBeth, J. J. |
| Brewitt-Taylor, L. | Mohr, A. |
| Butler, T. S. | Nesbitt, P. |
| Cambiaso, Count F. | Nisbet, R. H. |
| Carthew, Dr. M. | Nunn, W. |
| Chatteris, T. B. | Ogilvie, A. W. |
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| Dalgliesh, J. E. | Porter, A. A. |
| Dietrich, G. | Queripel, A. L. |
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| Eisenhofer, E. | Remy, Dr. jur. E. |
| Elwes, G. F. W. | Rieschick, H. |
| Eyton, S. W. | Robert, Dr. L. |
| Forty, C. H. | Rogers, B. H. |
| Gairdner, K. G. | Ross, D. |
| Gilmore, W. M. | Slack, T. A. |
| Godfrey, E. J. | Smith, E. Wyon |
| Groundwater, C. L. | Smith, Dr. M. |
| Groves, Mrs. S. P. | Smyth, G. C. |
| Grut, W. L. | Spigno, A. B. |
| Harrop, F. S. | Sprater, Major W. |
| Healey, E. | Ward, T. R. J., C.I.E., M.V.O. |
| Herbert, E. G. | Webb, G. E. |
| Irwin, A. J. | Weeks, W. G. |
| Keddie, J. F. | Williamson, W. J. F. |
| Kemp, P. R. | Wolf, G. |
| Keynes, S. C. | Yates, H. C. St. J. |
| Lambert, S. G. | Zabel, F. |
| Laydeker, E. A. | |

HONORARY MEMBERS.

H.R.H. Prince Chumporn.

Count Nils Gyldenstolpe.

THE
JOURNAL
OF THE
Natural History Society of Siam.

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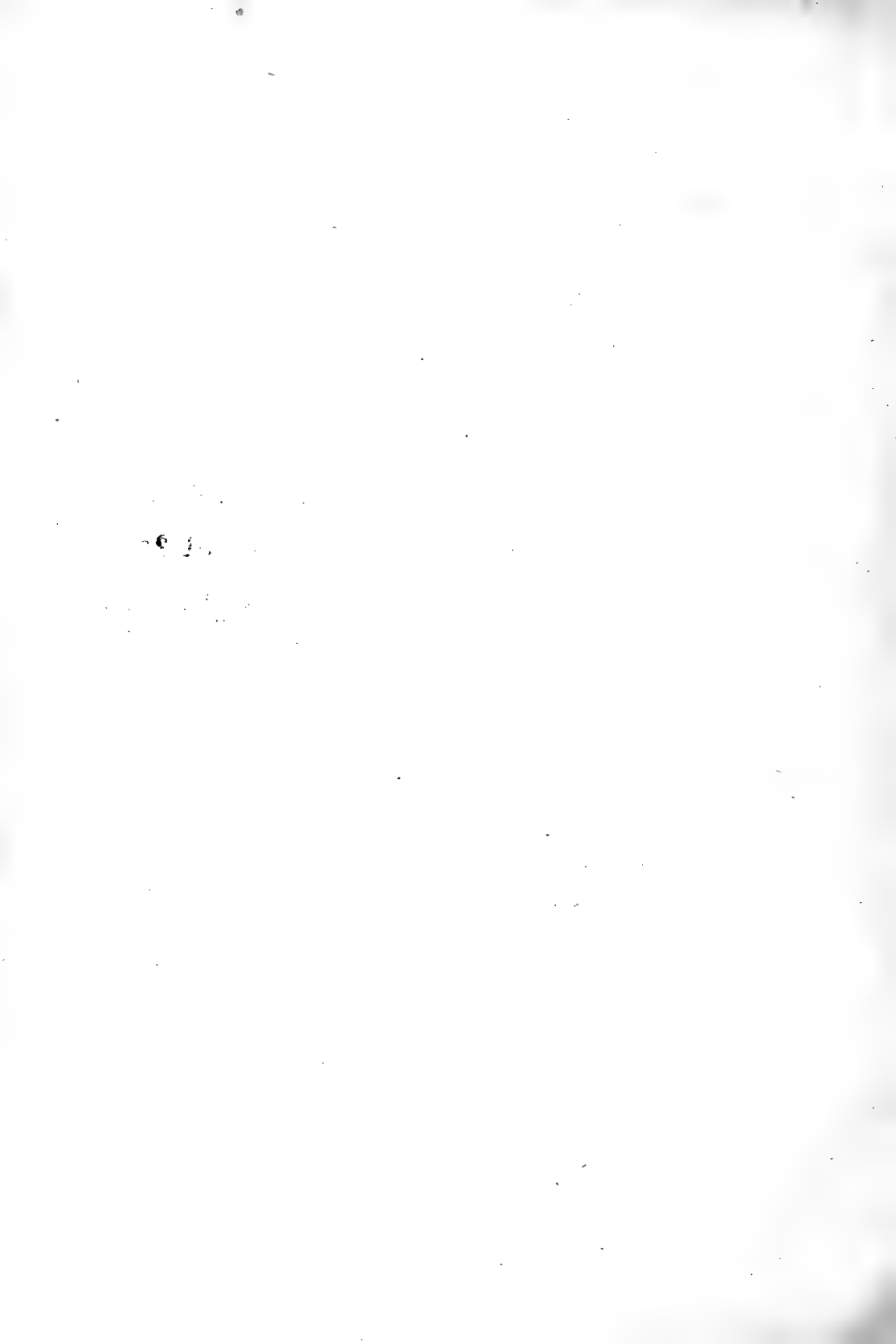
EDITED BY

Malcolm Smith and E. G. Herbert.

Price to Non-Members, _____ Tcs. 2.00.

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THE
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December 1915.

Vol. 1.

No. 4.

ON TWO NEW RATS FROM THE INNER
GULF OF SIAM.

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



During a short visit to Koh Si Chang and Koh Phai, I obtained a number of specimens of *Epimys rattus*, which appears to be the only species of terrestrial mammal inhabiting the two islands other than the squirrels that I have already dealt with in the Journal of this Society.

These rats differ sufficiently from each other and from any named form of *E. rattus* from South-East Asia to make it necessary to describe them. From Flower's notes on the common rats of Bangkok (P. Z. S. 1900, p. 361) it would seem that the animals of that locality are in part of somewhat similar type.

***Epimys rattus portus*, subsp. nov.**

Type. Aged male (skin and skull) No. 1941/C B. K. Collected on Koh Si Chang, Inner Gulf of Siam, 27th January, 1915.

Characters. A long-tailed race of *E. rattus* of notably yellow and bright colouration.

Colour. Above light ochraceous-tawny becoming paler on the sides and limbs and striped (coarsely grizzled) on the dorsal region by the dark tips of flexible pale-based spines and longer dark piles, the latter being most conspicuous on the rump. Base of fur grey.

Under-surface to the bases of the hairs, white, fairly clearly margined, and continuous down the thighs to the hind-feet which are conspicuously pale. Tail dark throughout.

Skull and Teeth. Hardly differ from those of mainland animal except that the cranium seems to be rather narrower or more pear-shaped, owing to the closer approximation of the parietal ridges while the sides of the cranium are less vertical.

Measurements. Ears of type, 24, of the series, 22-24 mm.

For other measurements see table p. 223.

Specimens examined. Thirteen, all from Koh Si Chang.

Remarks. The light upper surface closely resembling in colour the back of some races of *surifer* rats markedly separates this form from the much darker, duller mainland animals. This bright back and the pure white under surface seem further to be present at all ages, as young individuals do not differ from adults.

Epimys rattus poenitentiarii, subsp. nov.

Type. Adult male (skin and skull) No. 1966/C. B. K. Collected on Koh Phai, Inner Gulf of Siam, 1st February, 1915.

Diagnosis. Colour like *E. r. portus* but size rather smaller. Skull like that *E. r. portus* but with bullae markedly smaller and less dilated than is the case both with it and with the mainland animal.

Measurements. Ear of type 23, of series 21-23 mm.

For other measurements see table p. 224.

Specimens examined. Fifteen all from Koh Phai.

Remarks. Besides being a rather less robust animal the conspicuous difference in size and form of bullae compel separation of this animal from that of Koh Si Chang and the mainland.

MEASUREMENTS OF *EPIMYS RATTUS*. SUBSP.

Subspecies and Locality	Sex	Head and Body	Tail	Hind-foot	SKULL								No.	Remarks.	
					Greater length	Condylobasilar length	Diastema	Upper molar row	Length Palatal Foramina	Median Nasal Length	Combined Nasal Breadth	Zygomatic Breadth			
<i>Epimys rattus portus</i> .															
Koh Si Chang, Inner Gulf of Siam	M	190	217	36	43.5	38.5	12.6	7.3	8.0	16.7	5.0	21.1	1926	Adult	
"	M	195	223	38.5	45.0	39.1	12.3	7.7	8.4	16.3	5.2	19.8	1928	Aged	
"	M	183	194	37	45.0	39.7	12.7	7.8	8.7	16.2	4.8	19.6	1929	"	
"	M	184	214	35	45.3	39.5	12.3	8.0	8.6	17.0	5.1	20.8	1930	"	
"	F	198	214	34	46.0	39.5	12.0	7.8	8.5	18.0	5.4	21.8	1931	Adult	
"	F	190	210	36	44.2	38.6	11.7	7.3	8.2	16.0	4.9	21.1	1933	"	
"	M	199	228	37	47.2	41.4	13.1	7.3	9.4	17.7	5.5	21.7	1941	Type, aged	
"	M	180	214	36	43.8	38.5	11.9	7.3	8.1	15.4	4.9	20.5	1942	Adult	
"	F	185	220	35.5	43.5	38.3	12.1	7.2	8.2	16.5	4.9	20.9	1943	"	
"	F	194	216	36	43.5	38.3	11.7	7.7	8.0	16.1	5.0	21.5	1944	"	

MEASUREMENTS OF *EPIMYS RATTUS*. SUBSP.

Subspecies and Locality	Sex	Head and Body	Tail	Hind-foot	SKULL								No.	Remarks	
					Greatest length	Condylar length	Diastema	Upper molar	Length Palatal Foramina	Median Nasal Length	Combinal Nasal Breadth	Zygomatic Breadth			
<i>Epimys rattus pacificus</i>															
Koh Phai, Inner Gulf of Siam	F	176	208	35	43.0	37.1	11.2	7.7	8.1	16.0	4.4	20.2	1955	Adult	
"	F	188	209	33	42.8	37.2	11.5	7.2	8.9	16.6	5.0	20.8	1956	"	
"	M	187	219	35	42.4	37.0	11.0	7.3	8.2	15.9	4.8	20.0	1958	Aged	
"	M	186	209	36	42.8	37.8	11.3	8.0	8.6	15.8	4.4	19.5	1961	Adult	
"	M	185	215	36	43.7	38.0	11.8	7.5	8.1	17.2	4.7	20.5	1962	"	
"	M	209	220	37	43.1	37.3	11.5	7.2	8.1	15.5	4.7	19.9	1964	"	
"	M	184	206	36	44.0	38.0	11.2	7.6	8.7	16.2	4.5	19.9	1965	"	
"	M	182	209	36	43.5	37.8	12.0	6.9	9.2	16.7	5.0	20.0	1966	Type, Aged	
"	M	177	206	35	42.0	36.8	11.1	7.8	8.8	15.2	4.7	20.2	1967	Adult	
"	F	192	217	36	42.8	37.5	11.1	7.1	8.8	16.0	4.5	19.4	1968	"	

SOME NOTES ON SCIURUS FINLAYSONI, AND OTHER SQUIRRELS OF SIAM.

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

Through the kindness of Dr. Malcolm Smith I have recently received from Lopburi, two fresh spirit specimens of the "white" squirrel of Siam (*Sciurus finlaysoni finlaysoni*, Horsfield).

As our knowledge of this species is very slight and is based mainly on old and badly-prepared specimens I have taken the following measurements of these two examples and, in order that the difference in size between them and my recently described *Sciurus finlaysoni portus* from Koh Si Chang may be seen at a glance, have placed in a third column the *maximum* dimensions from the table of measurements accompanying my account of that small island race.¹

	<i>S. f. finlaysoni</i>		<i>S. f. portus</i>
	Lopburi		Ko Si Chang
	Male	Female	Maximum, both sexes.
Head and body	210	207	202
Tail	207	218	193
Hind foot	48	49	44.5
Skull :—			
Greatest length	51.3	53.0	47.7
Condylö-basilar length	43.0	44.0	41.0
Palatilar length	20.9	21.2	20.0
Diastema	11.2	11.4	10.7
Upper molar row	10.0	10.4	9.5
Interorbital breadth	19.9	19.0	17.0
Zygomatic breadth	32.3	31.6	28
Median nasal length	14.7	17.0	13

A large series of the mainland animal would doubtless show much greater differences than are evident here, but even with the present material these are sufficiently distinct.

1. *antea*, p. 157.

In the account of *S. f. portus* it was stated that that race was rather yellower than the mainland form, but the fresh material shows that the contrary is the case especially about the rump and base of tail. In both races the base of the fur of the upper side is pale grey; the large series of *S. f. portus* (26 examples) is very variable in that respect; many are as grey as the mainland pair but again many have the grey very pale and confined to the extreme roots of the hair.

There are no other differences between the two: both have black eye and soles.

Dr. Anderson when discussing the squirrels of this type² classed them all as forms of *Sciurus ferrugineus*, F. Cuv., but, *finlaysoni*, dating from 1824, is the older name in the group if we admit the relatedness of many of the squirrels of Burma and Siam as Anderson maintained. The latest review of them is that of Mr. R. C. Wroughton in the *Annals and Magazine of Natural History* ³ under the title "On the forms of Squirrel hitherto classed under *Sc. finlaysoni*, Horsf."

Therein *S. ferrugineus* of Burma and *S. cinnamomeus*, Temm., of Siam are given rank as distinct species on the ground that the former has black feet while the latter has not, but the reason seems inadequate for regarding these as other than subspecies of *ferrugineus*.

Further it seems to me possible to arrange the forms dealt with by Mr. Wroughton in such a way that their affinities are more clearly shown than is the case in his valuable paper. The present notes, however, are only of a tentative nature for I have had no opportunity to see the whole of the material of which they treat.

First then come the red *ferrugineus* with the subspecies *cinnamomeus* (and possibly other races to be distinguished from the mainland), together with *frandseni*, mihi, from Koh Chang: these are large squirrels with a greatest length of skull of about 56 mm. and appear to be quite distinct from those mentioned below.

Next, on account of similar size, may be placed *harmandi* M-Edw., of Phu Quoc and *albivivilli*, mihi, of Koh Kut, both of which, being island forms, we may for the present regard as species though perhaps related to those following.

Of the remaining animals the white *finlaysoni*, Horsf. is recorded from the course of the Menam south of Pichit, the Korat

2. *Anat. and Zool. Researches* p. 243 (1878).

3. Series 8, vol. ii, p. 393, Nov. 1908.

Plateau and east to Chantabun. Over much of the same country occurs a form (skull length about 50 mm.) to which the name *bocourti* was applied by Milne-Edwards (type from Ayuthia), but this is such an unstable squirrel and so many of the examples are nearly white (Anderson records specimens "white marked by great brown spots"), that it is possible the name is invalid, being applied to aberrations of *finlaysoni* with which it closely agrees in size as do the geographical races *sinistralis* (skull length about 49 mm.) from the Upper Menam above Pichit, *dextralis* (skull length about 52 mm.) from the Meping below Raheng, *lylei* (skull length about 54 mm.) from Chiengmai, and *nox* (skull length about 53.5 mm.) from Siracha S. E. of Bangkok, all described by Wroughton in the paper mentioned.

The insular forms *portus* and *folletti*, mihi, from Koh Si Chang and Koh Phai, with *germaini*, M-Edw., from Poulo Condore are naturally smaller (skull lengths about 47 mm.) having regard to the kind of island they occupy. The two former are subspecies of *finlaysoni*, but the black *germaini* is so fixed and its locality so isolated and remote that it may now well be regarded as a distinct species though in appearance but a miniature *nox*, or *albivexilli*. From the white *finlaysoni* to the black *nox* there is, one way or another through the other forms, a complete gradation of colour.

These conclusions may be tabulated somewhat after this fashion.

Mainland	Islands
sp. ferrugineus	subsp. frandseni
subsp. cinnamomeus	sp. harmandi
	sp. albivexilli
sp. finlaysoni	subsp. portus
	subsp. folletti
? sp. bocourti	
subsp. sinistralis	
subsp. dextralis	
subsp. lylei	
subsp. nox	
	sp. germaini

There remains one more squirrel, *S. floweri*, Bonhote,⁴ known from a single specimen from Klong Morn near Bangkok. Though the author states that it is adult, the skull is smaller (greatest length 44 mm.) than the island races of *inlaysoni*: in colour, however, the specimen appears to resemble animals which have been classed as *bocourti*. Until we know more about it, it is impossible to say whether it is a good form and, if so, what its relationships are.⁵



4. *Ann. and Mag. Nat. Hist.*, Series 7, Vol. VII, p. 455 (1901).

5. If any member of the Society would help to clear up this question by collecting squirrels in the neighbourhood of Bangkok I should welcome the opportunity of examining them. Specimens are most easily preserved in methylated spirits or a five per cent. solution of formalin. They should be opened up along the underside of the body, gutted and washed before immersion.

LIST OF BIRDS COLLECTED BY MR. EMIL EISENHOFER IN NORTHERN SIAM.

BY NILS GYLDENSTOLPE, B. A.

(Continued from Vol. 1, No. 3, p. 172).

Fam. *EURYLÆMIDÆ*

105. (937). *EURYLÆMUS JAVANICUS*, *Horsf.* (*) Horsfield's Broadbill.

106. (939). *CORYDON SUMATRANUS*, *Raffl.* (*) The Dusky Broadbill.

The most common Broadbill at Koon Tan.

+107. *SERILOPHUS LUNATUS LUNATUS*, *Gould.* (*) Gould's Broadbill. Synonymous with *S. lunatus*, Gould, *F. B. I.*, No. 942.

One specimen only, shot near Kao Plyng.

+108. *PSARISOMUS DALHOUSIÆ DALHOUSIÆ*, *Jameson.* (*) The Long-tailed Broadbill. Synonymous with *P. dalhousiæ*, Jameson, *F. B. I.*, No. 944.

Of this brilliantly coloured bird there are only two specimens, both obtained at Pa Hing.

Fam. *PICIDÆ*

+109. (948). *GEVINUS STRIOLATUS*, *Blyth.* The Little Scaly-bellied Green Woodpecker.

110. (954). *GEVINUS NIGRIGENIS*, *Hume.* (*) The Red-rumped Green Woodpecker.

111. *PICUS CANUS OCCIPITALIS*, *Vig.* (*) The Black-naped Green Woodpecker. Synonymous with *Gecinus occipitalis*, Vig., *F. B. I.*, No. 950.

112. *PICUS CHLOROLOPHUS CHLOROLOPHUS*, *Vieill.* (*) The Small Himalayan Yellow-naped Woodpecker. Synonymous with *Gecinus chlorolophus*, Vieill., *F. B. I.*, No. 951.

113. (955). *CHRYSOPHLEGMATA FLAVINUCHA*, *Gould.* (*) The Large Yellow-naped Woodpecker.

+114. (959). *GEVINULUS VIRIDIS*, *Blyth.* The Southern Pale-headed Woodpecker.

115. (975). *IYNGIPICUS CANICAPILLUS*, *Blyth.* (*) The Burmese Pigmy Woodpecker.
116. (982). *MIGLYPTES JUGULARIS*, *Blyth.* (*) The Black-and-Buff Woodpecker.
117. *MICROPTERNUS PHÆOCEPS PHÆOCEPS*, *Blyth.* (*) The Northern Rufous Woodpecker. Synonymous with *M. phæoiceps*, *Blyth.*, *F. B. I.*, No. 983.
118. (988). *TIGA JAVANENSIS*, *Ljung.* (*) The Common Golden-backed Three-toed Woodpecker.
119. *CHRYSOCOLAPTES GUTTACRISTATUS INDO-MALAYICUS*, *Hesse.* (*) The Golden-backed Woodpecker. A geographical race of *C. gutticristatus*, *Tickell.*, *F. B. I.*, No. 992.
120. (995). *HEMICERCUS CANENTE*, *Less.* (*) The Heart-spotted Woodpecker
121. *MÜLLERIPICUS PULVERULENTUS HARTERTI*, *Hesse.* (*) The Great Slaty Woodpecker. Synonymous with *Hemilophus pulverulentus*, *Temm.*, *F. B. I.*, No. 996.
122. *THRIPONAX JAVENSIS FEDDENI*, *Blanf.* (*) The Burmese Great Black Woodpecker. A subspecies of *T. feddeni*, *Blanf.*, *F. B. I.*, No. 998.
123. (1003). *IYNX TORQUILLA*, *Linn.* The Common Wryneck.

Fam. *CAPITONIDÆ*.

- 124. (1007). *MEGALÆMA VIRENS*, *Bodd.* The Great Chinese Barbet.
125. *THEREICERYX LINEATA HODGSONI*, *Bp.* (*) The Lineated Barbet. Synonymous with *T. lineatus*, *Vieill.*, *F. B. I.*, No. 1009.
126. *THEREICERYX PHÆOSTRICTA SAIGONENSIS*, *Neum.* (*)
127. (1013). *CYANOPS DAVISONI*, *Hume.* Davison's Blue-throated Barbet.
128. (1016). *CYANOPS CYANOTIS*, *Blyth.* (*) The Blue-eared Barbet.
- †129. (1019). *XANTHOLÆMA HÆMATOCEPHALA*, *P. L. S. Müll.* The Crimson-breasted Barbet.

Fam. *CORACIADÆ*.

130. (1023). *CORACIAS AFFINIS*, *McClell.* (*) The Burmese Roller.
131. *EURYSTOMUS ORIENTALIS CALONYX*, *Sharpe.* (*) The Broad-billed Roller.

This subspecies of *Eurystomus orientalis* (F. B. I., No. 1025) is characterized by having, among other points of difference, the outer webs of the rectrices blue, while those in the typical form are black without any bluish shade. The average length of the wing in *E. o. calonyx* is 180-203 mm., against 172-194 mm. in *E. orientalis orientalis*.

Fam. MEROPIDÆ.

- + 132. MÈROPS ORIENTALIS BIRMANUS, *Newm.* Synonymous with *M. viridis*, The Common Indian Bee-eater. Linn., F. B. I., No. 1026.
- 133. MELITTOPHAGUS SWINHOEI, *Hume.* (*) The Chestnut-headed Bee-eater. Synonymous with *M. swinhoii*, Hume, F. B. I., No. 1030,
- 134. (1031). NYCTIORNIS ATHERTONI, *Jard. & Selby.* (*) The Blue-bearded Bee-eater.

Fam. ALCEDINIDÆ.

- 135. ALCEDO ISPIDA BENGALENSIS, *Gm.* (*) The Common Indian Kingfisher. Synonymous with *A. ispida*, Linn., F. B. I., No. 1035.
- + 136. CEYX TRIDACTYLUS, *Pall.* The Indian Three-toed Kingfisher. Synonymous with *C. tridactyla*, Pall., F. B. I., No. 1040.
- 137. PELARGOPSIS GURIAL BURMANICA, *Sharpe.* (*) The Burmese Brown-headed Stork-billed Kingfisher. A geographical race of *P. gural*, Pearson, F. B. I., No. 1043.
- 138. HALCYON SMYRNENSIS FUSCA, *Bodd.* (*) The White-breasted Kingfisher. A subspecies of *H. smyrnensis*, Linn., F. B. I., No. 1044.
- 139. (1045). HALCYON PILEATA, *Bodd.* (*) The Black-capped Kingfisher.
- + 140. (1046). CALLIALCYON LILACINA, *Swains.* The Ruddy Kingfisher.
- 141. (1050). CARCINEUTES PULCHELLUS, *Horsf.* (*) The Banded Kingfisher.

Fam. BUCEROTIDÆ.

- 142. (1051). DICHOCEROS BICORNIS, *Linn.* (*) The Great Hornbill.

143. (1053). ANTHRACOCEROS ALBIROSTRIS, *Shaw. & Nodd.* (*) The Indo-Burmese Pied Hornbill.

144. (1054). RHYTHOCEROS UNDULATUS, *Shaw.* (*) The Malayan Wreathed Hornbill.

Fam. UPUPIDÆ.

145. UPUPA EPOPS INDICA, *Reichenb.* (*) The Indian Hoopoe. Synonymous with *U indica*, Reich., *F. B. I.*, No. 1067.

Fam. CAPRIMULGIDÆ.

+146. (1090). CAPRIMULGUS MONTICOLA, *Franklin.* Franklin's Nightjar.

Appears to be rare, as there is only a single specimen in the collection.

+147. CAPRIMULGUS MACRURUS AMBIGUUS, *Hart.* Horsfield's Nightjar. Synonymous with *C. macrurus*, Horsf., *F. B. I.* No. 1093.

The most common Nightjar in this part of Siam.

+148. (1096). LYNCORNIS CERVINICEPS, *Gould.* The Great Eared Nightjar.

Of this fine species there are two specimens, both obtained in the neighbourhood of Koon Tan. One of these is an immature bird, with the following measurements:—Wing=265 mm.; tail=170 mm. The wing of the adult specimen measures 320 mm., and the tail 223 mm.

Fam. TROGONIDÆ.

149. (1101). HARPACTES ERYTHROCEPHALUS, *Gould.* (*) The Red-headed Trogon.

150. HARPACTES ORESKIOS, *Temm.* (*) The Yellow-breasted Trogon. Synonymous with *H. orescius*, Temm., *F. B. I.*, No. 1103.

Fam. CUCULIDÆ.

+151. (1107). CUCULUS MICROPTERUS, *Gould.* The Indian Cuckoo.

+152. (1108). HIEROCOCCYX SPARVERIOIDES, *Vig.* The Large Hawk-Cuckoo.

+153. CACOMANTIS MERULINUS QUERULUS, *Heine.* The Rufous-bellied Cuckoo. Synonymous with *C. merulinus*, Scop., *F. B. I.*, No. 1113.

+154. (1117). SURNICULUS LUGUBRIS, *Horsf.* The Drongo Cuckoo.

155. (1119). *COCCYSTES COROMANDUS*, *Linn.* (*) The Red-winged Crested Cuckoo.
156. (1120). *EUDYNAMIS HONORATA*, *Linn.* (*) The Indian Koel.
157. *RHOPODYTES TRISTIS HAINANUS*, *Hart.* (*) The Large Green-billed Malkoha. A geographical race of *R. tristis*, *Less.* *F. B. I.*, No. 1123.
158. *CENTROPUS SINENSIS INTERMEDIUS*, *Hume.* (*) The Common Coucal. A subspecies of *C. sinensis*, *Steph.*, *F. B. I.*, No. 1130.
159. *CENTROPUS BENGALENSIS BENGALENSIS*, *Gm.* The Lesser Coucal. Synonymous with *C. bengalensis*, *Gm.*, *F. B. I.*, No. 1133.

Fam. *PSITTACIDÆ*.

- +160. (1136). *PALÆORNIS INDOBURMANICUS*, *Hume.* The Large Burmese Paroquet.
161. (1140). *PALÆORNIS ROSA*, *Bodd.* (*) The Eastern Blossom-headed Paroquet.
- +162. (1141). *PALÆORNIS SCHISTICEPS*, *Hodgs.* The Slaty-headed Paroquet.
163. (1142). *PALÆORNIS FINSCHI*, *Hume.* (*) The Burmese Slaty-headed Paroquet.
164. *PALÆORNIS FASCIATA*, *Müll.* (*) The Red-breasted Paroquet. Synonymous with *P. fasciatus*, *Müll.*, *F. B. I.*, No. 1145.
- +165. (1150). *LORICULUS VERNALIS*, *Sparrrm.* The Indian Loriquet.

Fam. *ASIONIDÆ*.

- +166. (1164). *KETUPA ZEYLONENSIS*, *Gm.* The Brown Fish-Owl. One specimen measured has a wing of 390 mm. and tail of 190 mm.
- +167. *SCOPS BACCAMÆNA LEMPIJI*, *Horsf.* The Collared Scops Owl. Synonymous with *S. bakkamæna*, *Pennant*, *F. B. I.*, No. 1178.
168. (1183). *GLAUCIDIUM CUCULOIDES*, *Vig.* (*) The Large Barred Owlet.
- +169. (1186). *GLAUCIDIUM BRODIEI*, *Burton.* The Collared Pigmy Owlet.
Seems to be fairly common at Koon Tau.
170. (1187). *NINOK SCUTULATA*, *Raffl.* (*) The Brown Hawk-Owl.

Fam. *FALCONIDÆ*.

- +171. (1212). *SPIZAËTUS LIMNAËTUS*, *Horsf.* The Changeable Hawk-Eagle.

- + 172. SPILORNIS CHEELA RUTHERFORDI, *Hume*. The Crested Serpent Eagle. A subspecies of *S. cheela*, Lath., *F. B. I.*, No. 1217. A fine series, showing the different plumages of this variable bird.
- + 173. (1221). BUTASTUR LIVENTER, *Temm.* The Rufous-winged Buzzard-Eagle.
174. (1222). BUTASTUR INDICUS, *Gm.* (*) The Grey-faced Buzzard-Eagle.
- + 175. (1227). POLIOAËTUS HUMILIS, *Müll. & Schl.* Hodgson's Fishing-Eagle.
- + 176. (1236). CIRCUS MELANOLEUCUS, *Forster*. The Pied Harrier.
- + 177. ASTUR BADIUS POLIOPSIS, *Hume*. (*) The Shikra. Synonymous with *A. badius*, *Gm.*, *F. B. I.*, No. 1244.
- Very common everywhere at Koon Tan.
178. (1246). LOPHOSPIZIAS TRIVIRGATUS, *Temm.* (*) The Crested Goshawk.
- + 179. (1248). ACCIPITER VIRGATUS, *Reinw.* The Besra Sparrow-Hawk.
180. (1251). BAZA LOPHOTES, *Temm.* (*) The Black-crested Baza.
- + 181. (1267). MICROHIERAX EUTOLMUS, *Hodgs.* The Red-legged Falconet.
- + 182. (1270). POLIOHIERAX INSIGNIS, *Wald.* Feilden's Hawk.

Fam. COLUMBIDÆ.

183. CROCOPUS PHENICOPTERUS VIRIDIFRONS, *Blyth.* (*) The Burmese Green Pigeon. A geographical race of *C. phænicopterus*, Lath., *F. B. I.*, No. 1271.
184. OSMOTRERON POMPADORA PHAYREI, *Blyth.* (*) The Ashy-headed Green Pigeon. A subspecies of *O. phayrei*, Blyth, *F. B. I.*, No. 1273.
185. (1281). TRERON NEPALENSIS, *Hodgs.* (*) The Thick-billed Green Pigeon.
186. CARPOPHAGA ÆNEA ÆNEA, *Linn.* (*) The Green Imperial Pigeon. Synonymous with *C. ænea*, Linn., *F. B. I.*, No. 1284.
187. DUCULA INSIGNIS GRISEICAPILLA, *Blyth.* (*) The Grey-headed Imperial Pigeon. Synonymous with *D. griseicapilla*, Wald., *F. B. I.*, No. 1287.
188. (1291). CULCOPHAPS INDICA, *Linn.* (*) The Bronze-winged Dove.

189. STREPTOPELIA TURTUR MEENA, *Sykes*. The Indian Rufous Turtle Dove. Synonymous with *Turtur orientalis*, Lath., *F. B. I.*, No. 1304.
190. STREPTOPELIA SURATENSIS TIGRINA, *Temm.* (*) The Malay Spotted Dove. Synonymous with *Turtur tigrinus*, Temm., *F. B. I.*, No. 1308.
191. CENOPELIA TRANQUEBARICA HUMILIS, *Temm.* (*) The Burmese Red Turtle-Dove. Synonymous with *C. tranquebarica*, *Hern.*, *F. B. I.*, No. 1311.
192. (1314). MACROPYGIA RUFICEPS, *Temm.* (*) The Little Malay Cuckoo-Dove.

Fam. PHASIANIDÆ.

193. (1328). GALLUS FERRUGINEUS, *Gm.* (*) The Red Jungle-fowl.
194. LOPHURA DIARDI, *Bp.* (*) The Siamese Fire-backed Pheasant.
195. (1368). TROPICOPERDIX CHLOROPUS, *Tick.* (*) The Green-legged Hill-Partridge.
196. (1374). FRANCOLINUS CHINENSIS, *Osbeck.* (*) The Eastern or Chinese Francolin.

Fam. TURNICIDÆ.

197. (1386). TURNIX BLANFORDI, *Blyth.* The Burmese Button Quail.

Fam. RALLIDÆ.

198. (1396). RALLINA FASCIATA, *Rafl.* The Malayan Banded Crake.
199. AMAURORNIS PHENICURUS CHINENSIS, *Boddl.* (*) The White-breasted Water-hen. A geographical race of *A. phenicurus* Penn., *F. B. I.*, No. 1401.

Fam. CHARADRIIDÆ.

200. (1432). SARCOGRAMMUS ATRINUCHALIS, *Blyth.* (*) The Burmese Wattled Lapwing.
201. (1435). HOPLOPTERUS VENTRALIS, *Wagl.* (*) The Indian Spur-winged Plover.
202. ÆGIALITES DUBIA, *Scop.* (*) The Little Ringed Plover. Synonymous with *Ægialitis dubia*, Scop., *F. B. I.*, No. 1447.
203. ÆGIALITES PLACIDA, *Gray.* The Long-billed Ringed Plover. Synonymous with *Ægialitis placida*, Gray, *F. B. I.*, No. 1449.

204. (1461). TOTANUS GLAREOLA, *Gm.* The Wood Sandpiper.
 205. (1462). TOTANUS OCHROPUS, *Linn.* (*) The Green Sandpiper.
 206. TRINGOIDES HYPOLEUCOS, *Linn.* (*) The Common Sandpiper. Synonymous with *Totanus hypoleucus*, *Linn.*, *F. B. I.*, No. 1460.
 207. GALLINAGO GALLINAGO, *Linn.* (*) The Fantail Snipe. Synonymous with *G. caelestis*, *Frenzel*, *F. B. I.*, No. 1484.
 208. (1485). GALLINAGO STENURA, *Kuhl.* (*) The Pintail Snipe.
 209. (1488). ROSTRATULA CAPENSIS, *Linn.* The Painted Snipe.

Fam. ARDEIDÆ.

210. (1566). ARDEOLA BACCHUS, *Bp.* (*) The Chinese Pond-Heron.
 211. (1567). BUTORIDES, JAVANICA, *Horsf.* The Little Green Heron.
 212. (1572). ARDETTA CINNAMOMEA, *Gm.* The Chestnut Bittern.

One specimen only, obtained near Koon Tau. Wing=145 mm; tail=47 mm; culmen=52 mm; tarsus=46 mm.



ON REPTILES AND BATRACHIANS FROM THE COAST AND ISLANDS OF SOUTH-EAST SIAM.

BY MALCOLM SMITH, M.R.C.S., L.R.C.P., AND C. BODENS KLOSS, F.Z.S.

[During December and January, 1914-5, I spent six weeks on the east side of the Gulf collecting vertebrates of all kinds. I was accompanied by three Dyak assistants and, at my suggestion, Dr. Smith sent his reptile-collector with my party.

On Koh¹ Chang and Koh Kut, at each of which we spent over a week, we obtained a fair number of reptiles, but on several of the smaller islands between these, on which we passed only a night or two, we were entirely unsuccessful. We had of course better fortune on the mainland, between Ok Yam at the southern extremity of the Franco-Siamese boundary, and Lem Ngop opposite Koh Chang, partly because at all the places where we camped there were villages where, encouraged by small presents, the inhabitants brought us such specimens of reptiles and batrachians as were easily found in the vicinity, and partly because the fauna was naturally much richer.

There is but little to remark about many of the species obtained, but an endeavour has been made to give as full a set of local references as the literature available will permit; until lately no serious study of the reptiles of Siam, as a zoo-geographical district, has been undertaken, and so it has remained for a beginning to be made in the compilation of a synonymy. The well known works of Mr. Boulenger, namely, the *British Museum Catalogues* and the *Faunas of India* and the *Malay Peninsula* with the synonymy in those volumes have not been quoted, but all other references of any value that we have been able to gather, have been inserted. The collection consisted of about 250 specimens, and we have given the first set to the British Museum of Natural History; to Mr. G. A. Boulenger, of that institution, we are much indebted for putting us right on two or three points of identification, and confirming the correctness of the whole.

1 Koh—Island.

For localities, the names of the British Admiralty Chart (2721) have been followed, except that instead of "Ile du Pic", "Le Chameau" and "Koh Loi" I have used respectively Koh Mehsi Yai, Koh Mehsi Lek and Koh Rang—names current locally. Klong Menao, unmarked, is about 15 miles north of Klong Yai.—C.B.K.]

CHELONIA.

1. CYCLEMYS DHOR, Gray.

Mocquard, Les Reptiles de l'Indo-Chine, p. 10 (1907); Robinson and Kloss, Journ. F.M.S. Mus., v, p. 193 (1915).

Three adult and two young individuals from Koh Chang.

The carapace of the largest example measures 220 by 158 mm. In the young animals the tail is relatively of much greater length than in the adult and is actually nearly as long as in the latter. The species was apparently common on Koh Chang and was obtained from the rocky stream above which the camp was placed, but was met with nowhere else during the excursion. It has been found also upon the mainland at Hup Bon, E. of Sriracha, where it appears to be fairly common. It is an active and voracious creature, devouring greedily animal as well as vegetable food. Its habits are chiefly aquatic.

2. CHELONE IMBRICATA, Linn.

Caretta squamata, Tirant, Mocquard, Mission Pavie, Indo-Chine, Etudes Diverses, III., p. 492 (1904).

Chelone imbricata, Mocquard, Les Reptiles de l'Indo-Chine, p. 15 (1907).

One example was obtained at Koh Chang and another observed at Koh Mak. The Hawksbill Turtle is not uncommon in the Gulf of Siam. The shields of the head and limbs in the specimen obtained, were black instead of dark brown.

LACERTILIA.

3. HEMIDACTYLUS FRENATUS, D. and B.

Mocquard, Les Reptiles de l'Indo-Chine, p. 29 (1907).

At Klong Yai this species was caught in numbers by the village children, but not so extensively as the next. One specimen is entirely without tubercles on the tail owing to reproduction of that part.

4. HEMIDACTYLUS PLATYURUS; Schneid.

Laidlaw, P.Z.S., 1901, p. 305; Mocquard, Les Reptiles de l'Indo-Chine, p. 28 (1907).

Exceedingly common in the village of Klong Yai.

5. LEPIDODACTYLUS CEYLONENSIS, Blgr.

A single example from Klong Menao. The species does not appear to have been recorded hitherto from Siam or eastern Indo-China, though known from Burma and the Malay Peninsula.

6. GECKO VERTICELLATUS, Laur.

Laidlaw, P.Z.S. 1901, part I., p. 306; Mocquard, Mission Pavie, Indo-Chine, Etudes Diverses, III, p. 485 (1904). Mocquard, Les Reptiles de l'Indo-Chine, p. 29 (1907). Robinson and Kloss, Journ. F.M.S. Mus., V., p. 153 (1915).

4 specimens. Koh Chang, and Klong Yai, S.E. Siam; Ok Yam, Franco-Siamese boundary on coast.

Common throughout Siam; besides those preserved, others were rejected, and the loud cry was heard from trees at many of the collecting stations.

7. DRACO TAENIOPTERUS, Günth.

Boettger, Zool. Anz, 1893, p. 433; Flower, P Z.S. 1899, p. 637.

2 males Klong Yai, 2 males 1 female Klong Menao, 12 males 2 females Koh Kut.

Colour of male. Upper surface; body, greenish-brown, membrane greenish-yellow with 5 irregular black bands. Under surface; body pale greenish-yellow, membrane dirty yellow, pouch dull yellow, throat and gular flaps deep crimson.

Females like the males but with the small gular pouch like the abdomen and the red of the throat and flaps much paler.

8. DRACO MACULATUS HAASII.

Draco haasii, Boettger, Zool. Anz., 1893, p. 424.

Two examples from Lem Ngop and a pair from Koh Kut.

The original types of *D. haasii* were founded upon two specimens obtained at Chantaboon by Dr. Erick Haase, one of which is in the British Museum, and the other in the Frankfort Museum. Mr. Boulenger does not consider them to be specifically distinct from *D. maculatus*, and of the specimens from Lem Ngop and Koh Kut he

thinks the same for he writes, "the *Draco* I must regard as a variety of *D. maculatus*, identical with *D. haasi*, of which we have one of the types from Siam."

We have therefore here accorded it subspecific rank, as it differs distinctly, both by its smaller size and by its colouration from the usual form of *D. maculatus* met with. A further series of 11 specimens, obtained since at Muak Lek and Pak Jong in the Dong Rek Mountains, confirm our ideas.

Colour in life (taken from the Lem Ngop and Koh Kut specimens).

Male.	Female.
Above. Brown with pale reddish and black markings.	Umber brown with darker markings.
Sides of body. Plumbeous blue.	Dirty white.
Centre of abdomen, chest, thighs. Bluish white.	Dull yellow.
Membrane above. Reddish orange with a few black spots near the body.	Gamboge, plentifully spotted with irregular blackish-brown markings.
Membrane below. Pale lemon.	As above.
Gular pouch. Brown with orange base	Pale orange.
Gular flaps. Indian yellow.	Indian yellow.

Length, Male, snout to vent 68 mm., tail 115.

„ Female, „ „ 66 „ „ „ 108.

9. ACANTHOSAURA CRUCIGERA, Boulenger.

A single female of this slightly differentiated race of *A. armata* was obtained on Koh Chang.

The close connection between the two races as defined, is shown in this example by the presence of twelve labials, and a tail only one and one half times as long as head and body. A slight, though distinct gular fold is present.

Head and body 105, tail 153 mm.

10. CALOTES VERSICOLOR, Daud.

Annandale, J. & P.A.S. Bengal, I., p. 83, 1905.

Ok Yam, Klong Yai, Klong Menao.

Common everywhere in S. E. Siam, but not met with on any of the adjacent islands visited.

11. CALOTES EMMA, Gray.

Flower, P.Z.S., 1899, p. 641; Mocquard, Les Reptiles de l'Indo-Chine, p. 26 (1907); Robinson and Kloss, Journ. F.M.S Mus., V., p. 154 (1915).

5 specimens. Koh Chang and Klong Yai, S. E. Siam; Ok Yam, Franco-Siamese Boundary on coast. A marked white lateral band is present in an adult and an immature specimen.

12. PHYSIGNATHUS MENTAGER, Günth.

Flower, P.Z.S., 1899, p. 641.; Mocquard, Les Reptiles de l'Indo-Chine, p. 27 (1907).

A large individual of this species was obtained at Klong Menao.

Total length 896 mm., snout to vent 231. In an example of about half the size found on Koh Kut the colouration was much more brilliant than in the older one. General colour above, brownish green, darkest on the head; body with 3 broad diagonal bars of paler blue-green edged with brown; tail pale isabelline with brown bands; hind legs above greenish brown. Underside of body, tail and forelimbs white, with a bright blue tinge in places; chest, patches on sides, under surface of legs, bright emerald-green; upper labial scales rose-pink washed with green, lower labials and sub-labial row of scales rose-pink, the latter edged with black; throat reddish yellow. Iris brown with an inner golden ring round the pupil.

This species, which is known from Siam, differs mainly from *P. cochinchinensis* of Cochin-China, in the possession of a lesser number of lateral or molar teeth, and in the presence of eleven large sub-labial scales instead of only six or seven.

The individual referred to above from Koh Kut, was kept alive for some time. It was a very sluggish creature, sitting about on the ground or in a tree, quite motionless, for most of the day. It never attempted to bite when handled. It was fed upon fish, meat, worms and insects. It was never seen to take food of its own accord, but on scratching its jaws would open its mouth and then take whatever was given it. Its power of changing colour was very slight, and varied only from light to dark. When running fast over ground, its action was bipedal, the fore limbs being folded back along the flanks. A young specimen of this lizard has been recently taken at Muak Lek,

in the Dong Rek Mountains. It does not differ in colouration from the adult.

13. *LIOLEPIS BELLIANA*, Gray.

Eight examples. Koh Chang and Klong Yai, S. E. Siam; Ok Yam, Franco-Siamese Boundary on Coast.

This well-known and beautiful ground-lizard was common everywhere in open country where grass and sandy soil would permit it to burrow. Such being the surroundings of most villages, it was brought in numbers by small boys for trifling rewards.

These lizards are much sought after by the country people as an article of diet, and are caught usually by means of a cleverly constructed spring noose placed across the entrance of the burrow they inhabit. They are also hunted for by gangs of youths, who beat up their haunts with sticks, killing them if possible as they dash away, or, if they succeeded in reaching their holes, digging them out and then despatching them.

These creatures must be very fertile, as in spite of constant persecution, their numbers never seem to diminish.

14. *VARANUS NEBULOSUS*, Gray.

Mocquard, *Les Reptiles de l'Indo-Chine*, p. 33 (1907).

A young example from Koh Chang. Total length 590 mm. Top and sides of head as far as the eyes still retaining the juvenile reddish yellow colouration, but no traces of black chevrons on the nape. Common in Siam in ever-green jungle.

This lizard, like the preceding one, is also hunted for the sake of its flesh.

15. *MABUIA MACULARIA*, Blyth.

Twenty examples from Koh Kut and five from Ok Yam and Klong Yai, S. E. Siam.

Head and shoulders rusty brown; rest of upper surface, limbs and tail, earthy; upper labials and spots on sides, yellow; chin, throat, chest and sides of neck, red.

The largest specimen measures:—Snout to vent 67, tail 110 mm. The series from the mainland has 28-32 scales round the body, that from Koh Kut, 30-34.

16. *MABUIA MULTIFASCIATA*, Kuhl.

Laidlaw, *P.Z.S.*, 1901, part 1, p. 310; Mocquard, *Les Reptiles de l'Indo-Chine*, p. 38 (1907).

Koh Kra, Koh Mak, Koh Kut, Klong Menao, Klong Yai, S. E. Siam; Ok Yam, Franco-Siamese boundary on coast.

A very common lizard wherever it occurs and always frequently met with, owing to its boldness and conspicuous habits.

Apart from the orange or red wash on the shoulders and flanks which is probably assumed in the breeding period and thus is not constant, three colour phases occur in the present series. In the first the back and sides are unmarked, except for a black dorso-lateral line. In the second, the back is marked by five black lines running between the rows of scales, which become indistinct posteriorly; between the outer of these lines and the dark line defining the back from the sides, two rows of scales occur. In the third the shoulders and sides are irregularly spotted with white, and the dorsal region may be either striped or plain.

17. *LYGOSOMA MACULATUM*, Blyth.

Flower, P.Z.S., 1899, p. 648; Les Reptiles de l'Indo-Chine, p. 38 (1907).

Many specimens from Koh Kut, and examples from Koh Chang, Koh Mak and Klong Yai.

Upper surface bronze brown spotted with black and yellowish; labials and sides of neck, red. Sides of body:—first a black stripe spotted with yellowish, below this a row of yellowish spots and beneath silver spotted black. Under surface white, belly yellow.

Snout to vent of largest individual (tail missing) 65 mm; of another 60, tail 123 mm. Most of the specimens have 42 scales round the body.

18. *LYGOSOMA BOWRINGII*, Günth.

12 specimens. 9 from Klong Yai, 1 example Koh Klum, 2 Koh Kra.

Above, brown becoming reddish towards and on the tail. Below, throat greenish-white, entire abdomen, yellow; tail and limbs, sides of neck and shoulders red, this narrowing over the forelimbs and widening to enclose the hindlimbs. Some black and white spots behind the forelimb, and a black line running from the eye to the mid-body.

This little skink is widely distributed throughout the country, in many places being exceedingly common. It is an extremely active creature in spite of the shortness of its legs.

OPHIDIA.

19. PYTHON RETICULATUS, Schneid.

Mocquard, Les Reptiles de l'Indo-Chine, p. 42 (1907); Smith, Journ. Nat. Hist. Soc. Siam, 1, p. 9 (1914).

One small example was obtained on Koh Chang where it was said to be common. The Reticulated Python has been found on most of the islands at the head of the Gulf, and is not uncommon on the mainland.

20. CHERSYDRUS GRANULATUS, Schneid.

Wall, Jour. Bombay. N. H. Soc. XXIII, p. 372. Barbour, Memoirs M.C.Z., Nov. 1912, XLIV, No. 1, p. 106.

One example from Koh Chang; this species is fairly common in the Gulf.

21. POLYODONTOPHIS COLLARIS, Gray.

One example from Koh Chang. This species, only recently recorded from Siam, appears to be widely, though sparingly distributed throughout the country.

22. TROPIDONOTUS PISCATOR, Schneid.

Tropidonotus piscator Mocquard, Les Reptiles de l'Indo-Chine, p. 47 (1907). Smith, Journ. Nat. Hist. Soc. Siam, 1, p. 14, (1914).

Natrix piscator, Barbour, Memoirs M.C.Z., Nov. 1912, XLIV, No. 1 p. 109.

Two examples from Koh Chang; common wherever it occurs.

23. TROPIDONOTUS CHRYSARGUS, Schleg.

Fascic. Malay. Zool., 1, p. 161 (1903).

Four examples from Klong Menao: the longest, 728 mm in length, appears to be greater than any yet recorded.

24. TROPIDONOTUS NIGROCINCTUS, Blyth.

Two examples from Klong Yai. The species has also lately been obtained in Northern Siam, and at Hup Bon, E. of Sriracha.

One of the two from Klong Yai was kept alive for some months. It was an active, graceful snake, diurnal in its habits. It fed greedily upon frogs and fish, picking the latter out of the water and bolting them with great rapidity.

Colour (in life). Above, olive-green anteriorly, olive-brown posteriorly, with faint, narrow blackish cross-bars. Head copper coloured, paling on the sides. An oblique black band below the eye, another behind it and a third upon the neck. Belly white, beneath

the tail, pinkish mottled with dark grey. Throat white, iris and tongue, dark brown.

The young individual referred to from Hup Bon, was, as is frequent with many snakes, much more vividly coloured than the adult, with strongly marked cross-bars and a broad black chevron upon the nape, pointing forwards.

25. TROPIDONOTUS SUBMINIATUS, Schleg.

Amphiesma subminiatus, Mocquard, Les Reptiles de L'Indo-Chine, p. 47, (1907).

Natrix subminiata, Barbour, Memoirs M.C.Z., Nov. 1912, XLIV, No 1, p. 111

Tropidonotus subminiatus, Smith, Journ. Nat. Hist. Soc. Siam, I, p. 15 (1914).

Two specimens from Ok Yam; apparently common everywhere in Siam.

26. COLUBER RADIATUS, Cantor.

Blgr, Fascic. Malay. Zool., I, p. 163 (1903); Smith, Journ. Nat. Hist. Soc. Siam, I, p. 95 (1914); Wall, Journ. Bombay N. H. S., XXIII, p. 206 (1915)

One specimen was taken on Koh Chang; it appears to be a common snake in most parts of the country.

27. SIMOTES CYCLURUS, Cantor.

Mocquard, Les Reptiles de l'Indo-Chine, p. 46 (1907); Smith, Journ. Nat. Hist. Soc. Siam, p. 97 (1914);

Two specimens from Koh Chang and Klong Yai: a very common snake in Siam. To this form which has 21 rows of scales and no longitudinal streaks the names of *fasciolatus* and *cochinchinensis* have been attached.

28. SIMOTES INORNATUS, Blgr.

Boulenger, Journ. Nat. Hist. Soc. Siam, Vol. 1, p. 68 (1914).

One example from Koh Kut, an anomalous individual with the 4th and 5th upper labials fused. As it appears to differ somewhat in other respects from the two specimens already known, we give a description of it here.

Nasal divided, portion of rostral seen from above as long as its distance from the frontal; suture between the internasals about one-third that between the prae-frontals: frontal one and one-third longer than broad, nearly one-fourth longer than its distance from end

of snout, equal to the parietals; loreal longer than deep; one pre- and two post-oculars; temporals 1 + 2; seven upper labials, fourth entering the eye; four lower labials in contact with the anterior chin-shields, which are about twice as long as the posterior.

Scales in 15 rows, smooth throughout. Ventrals 172; anal entire; subcaudals 32.

Colour in life:—dull sealing-wax red above with numerous ill-defined blackish cross-bars, the colour of which is chiefly confined to the edges of the scales. Upper side of head brownish with a darker cross band passing through the eye to the fourth and fifth labials, a dark spot on the frontal, an oblique dark bar from the parietals to the side of the neck, and a large **A** shaped marking from the frontal shield to the nape. Labials and lower parts pink, with a series of dark quadrangular spots on each side of the ventrals. Colour in spirit:—light brown above, white below, with markings as described.

Total length 345 mm., tail 45.

29. CERBERUS RHYNCHOPS, Schneid.

Mocquard, Les Reptiles de l'Indo-Chine, p. 51 (1907).

Hurria rynchops, Barbour, Memoirs Mus. Comp. Zool (Harvard), XLIV, No. 1, p. 123 (Nov. 1912).

Six specimens from Koh Chang, one individual being of a pale pinkish-fawn colour.

30. DIPSADOMORPHUS CYANEUS, D. & B.

Dipsas cyanea, Boulenger, Faun. Brit. Ind., Rept., p. 361 (1890)

Dipsadomorphus cyaneus, Mocquard, Les Reptiles de l'Indo-Chine, p. 50 (1907).

A male and female from Klong Menao.

The male, 1260 mm. long, contained when caught a freshly swallowed female, 1350 mm. in length.

The anterior palatine teeth are considerably larger than the posterior.

Emerald-green above, with the skin between the scales purplish black; yellowish-green below; chin and throat sky-blue; inside of mouth purplish black. Eye large and brownish grey.

This snake, until recently not known from Siam, has been found also upon Koh Phai, where it is not uncommon, and upon the adjoining mainland, E. of Sriracha. It is nocturnal in its habits, remaining by day coiled up among the branches of some bush or tree.

It is of sluggish disposition, but will bite viciously when caught. It feeds upon small mammals and other snakes.

31. DRYOPHIS PRASINUS, Boie.

Blgr, Fascic. Malay. Zool., I., p. 165 (1903); Mocquard, Les Reptiles de l'Indo-Chine, p. 49 (1907); Smith, Jour. Bombay N. H. S., XXIII., p. 785 (1915)

One example from Koh Chang and another from Koh Kut, both stone-grey in colour. The one from Koh Chang, a male, was an unusually large specimen. It measured 1985 mm. in total length, the tail forming 725 mm.

32. CHRYSOPELEA ORNATA, Shaw.

Blgr, Fascic. Malay. Zool., I, p 166 (1903); Mocquard, Les Reptiles de l'Indo-Chine, p. 49 (1907); Smith, Jour. Nat. Hist. Soc. Siam, I, p. 175 (1915).

Two examples of this beautiful snake were obtained at Klong Yai, and a third on Koh Chang.

33. HYDROPHIS TUBERCULATUS, Anders.

Distira tuberculata, Boulenger, Cat. Snakes, Brit. Mus, Vol. I, p. 293 (1896).

Distira cyanocincta. Wall, Mem. Asiat. Soc., II, No. 8, p. 220 (1909).

One example from Klong Yai, for the identification of which we are indebted to Mr Boulenger. As only a very few specimens of this snake are yet known to science, we append a description of our specimen.

Head small; eye less than its distance to the mouth; rostral broader than deep; nostril connects by suture to 2nd labial; frontal a little longer than broad, much shorter than the parietals; 1 prae- and 1 post-ocular; a large anterior temporal; 7 and 8 supralabials, the 3rd and 4th entering the eye, 1 to 4 entire, the remainder divided horizontally; 4 large infralabials, the first 3 in contact with the chin-shields; 2 pairs of well developed chin-shields, in contact with each other. Marginals after the 2nd infra-labial. Costals 32 anteriorly, 38 at the greatest diameter of the body, sub-imbricate, with a short, faint keel, sometimes broken in two. Diameter of neck about half the diameter of greatest thickness of body. Ventrals 308, small, equal to or less than two adjacent costals, faintly bicarinate, the keels sometimes broken in two.

Colour: Greenish white, with 55 broad black bands, which are broader than their interspaces. Head black with yellow markings.

34. ENHYDRIS HARDWICKII, Gray.

Hanitsch, Rept. Raffles Mus., 1897, p. 10; Wall, Mem. Asiat. Soc. Bengal, Vol. II, No. 8, p. 247 (1909). Mocquard, Les Reptiles de l'Indo-Chine, p. 52 (1907); Smith, J. Bombay N. H. Soc., XXIII, p. 785 (1915).

Four examples from Klong Yai, two adults and two young extracted from one of the former. Length of the young, 255 mm. This species is very common towards the head of the Gulf, but these examples are of unusually dark colouration; in the young the dark ventral markings form a broad and continuous, though irregular, band.

35. ENHYDRINA VALAKADIEN, Boie.

Enhydrina valakadien, Mocquard, Les Reptiles de l'Indo-Chine, p. 52 (1907).

Enhydrina valakadya, Wall, Mem. Asiat. Soc. Bengal, Vol. II, No. 8, p. 191, (1909).

Two specimens from Klong Yai.

36. LACHESIS GRAMINEUS, Shaw.

Trimeresurus gramineus, Mocquard, Les Reptiles de l'Indo-Chine, p. 57 (1907);

Lachesis gramineus, Smith, Jour. Nat. Hist. Soc. Siam I., p. 183 (1915).

One example from Koh Mehsi Yai. This snake is common in Bangkok, and in many other parts of Siam.

BATRACHIANS.

37. OXYGLOSSUS MARTENSII, Peters.

Flower, P.Z.S. 1899, p. 887.

Four examples from Ok Yam, three from Klong Yai, one from Koh Kut. Two of the series have a light vertebral line.

While we have placed these specimens under *O. martensii*, they are doubtfully distinct from *O. laevis*, Gunth., which is the older name.

38. RANA LIMNOCHARIS, Boie.

Boulenger, Fascic. Malay. Zool., I, p. 134 (1903); Barbour, Memoirs M.C.Z., XLIV, No. 1, p. 64 (1912).

A single example of this common frog from Ok Yam: snout to vent 35 mm.

39. RANA TIGRINA, Daud.

Boulenger, Fascic. Malay. Zool., I, p. 134 (1903); Laidlaw, P.Z.S., 1900, p. 885; Barbour, Memoirs M.C.Z., XLIV, No. 1, p. 63 (1912); Robinson & Kloss, Journ. F. M. S. Mus., V, p. 155 (1915).

Eleven examples from the S. E. Siamese mainland, and two from Koh Chang.

This frog is much esteemed by the Siamese as food, and in Bangkok is frequently brought into the market for sale. It is hunted for at night, during and after heavy storms, when its loud croak betrays its whereabouts. In the fields it is also fished for with a rod and line, a small frog, usually *Rana limnocharis*, being used as bait.

40. *RANA DORLÆ*, Boulenger.

Twenty-three examples from S. E. Siam and Koh Chang, Koh Mehsi and Koh Kut of all sizes: snout to vent of largest, 35 mm.

Originally described from Tenasserim and since known from the south of the Malay Peninsula, this frog does not seem to have been recorded from Siam before.

41. *RANA NIGROVITTATA*, Blyth.

Two specimens from Koh Chang, both of them unusually large, the biggest measuring 72 mm. from snout to vent.

42. *RANA ERYTHRAEA*.

Boulenger, Fascic. Malay. Zool., I, p. 135 (1903); Barbour, Memoirs M.C.Z., XLIV, No. 1, p. 67 (1912).

Two examples from Klong Yai, and another from Ok Yam.

43. *MICROHYLA BERDMORII*.

One specimen from Klong Yai, without any dark marking on the head and back.

44. *BUFO MELANOSTICTUS*, Schneid.

Boulenger, Fascic. Malay. Zool., I, p. 133 (1903); Barbour, Memoirs M.C.Z., XLIV, No. 1, p. 73 (1912).

Two moderate sized examples from Koh Chang.



ZOO-GEOGRAPHICAL DIVISIONS FOR SIAM.

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

While residents in Siam know the position of, or have no difficulty in locating, the towns, villages and various geographical features of that country, such is not the case with non-residents, who are furnished as a rule with only the small-scale map of an ordinary atlas. For many naturalists it would, therefore, lead to a clearer understanding of the zoology of the country, if a number of zoo-geographical divisions were agreed upon and generally employed.

For these I suggest the following :—

1. Northern Siam. The Laos country, mostly mountainous or submontane, north of a line (approximately Lat. $17^{\circ} 50'$, but for all practical purposes 18° North) between the mouth of the Me Mue or Thoungyin River, an affluent of the Salwin, and the great eastern bend of the MeKawng in Long. $101^{\circ} 30'$ E.

2. Central Siam. The great plain watered by the Menam Chao Praya and its tributaries, south of upper Siam, including the lowlands of the basin of the Bangpakong River in the south-east and the lower reaches of the MeKlawng and Petchaburi Rivers in the south-west.

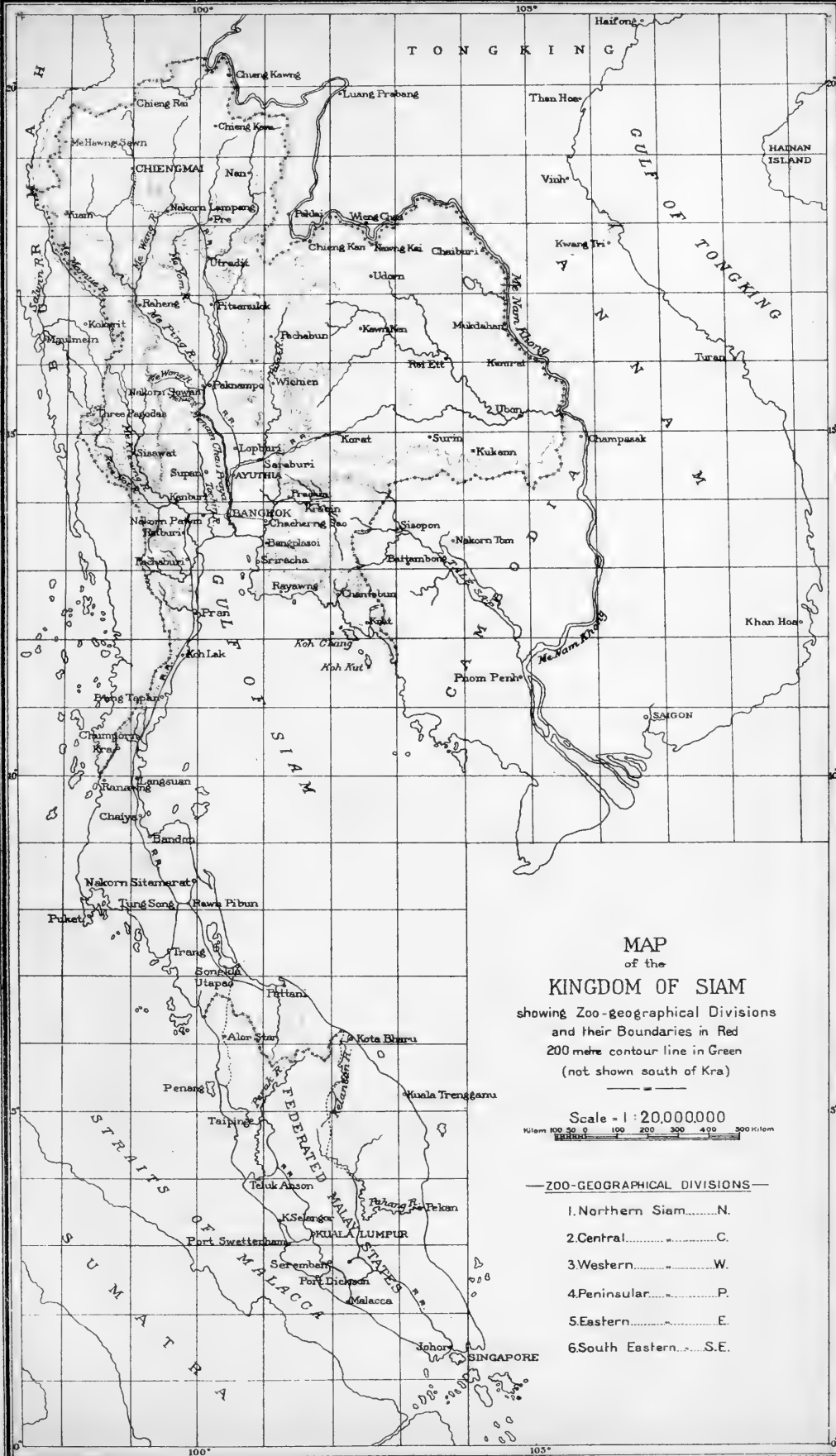
3. Western Siam. The hill country between the Tenasserim frontier and the Menam lowland plain from the Me Mue River mouth, south to Koh Lak in about Lat. $11^{\circ} 45'$ N. near Petchaburi.

4. Peninsular Siam. The Malay Peninsula from Koh Lak south to the Malayan boundary.

5. Eastern Siam. The "Korat Plateau" bounded on the north and east by the MeKawng, on the south by the Cambodian frontier and (continuing beyond this westwards) by the southern slopes of the Deng Rek Range to its termination near Saraburi; thence north to the MeKawng bend along the watershed between the Menam and MeKawng river systems.

6. South-eastern Siam. The varied country along the Gulf bounded in part by the southern edge of the Bangpakong basin (approximately in Lat. $13^{\circ} 20'$ N) and partly by the Battambang-Cambodian frontier.

In a small area like Siam, we should not expect to find much variation in the zoology if it were all the same kind of country, but when this differs—forests and open country, mountains and

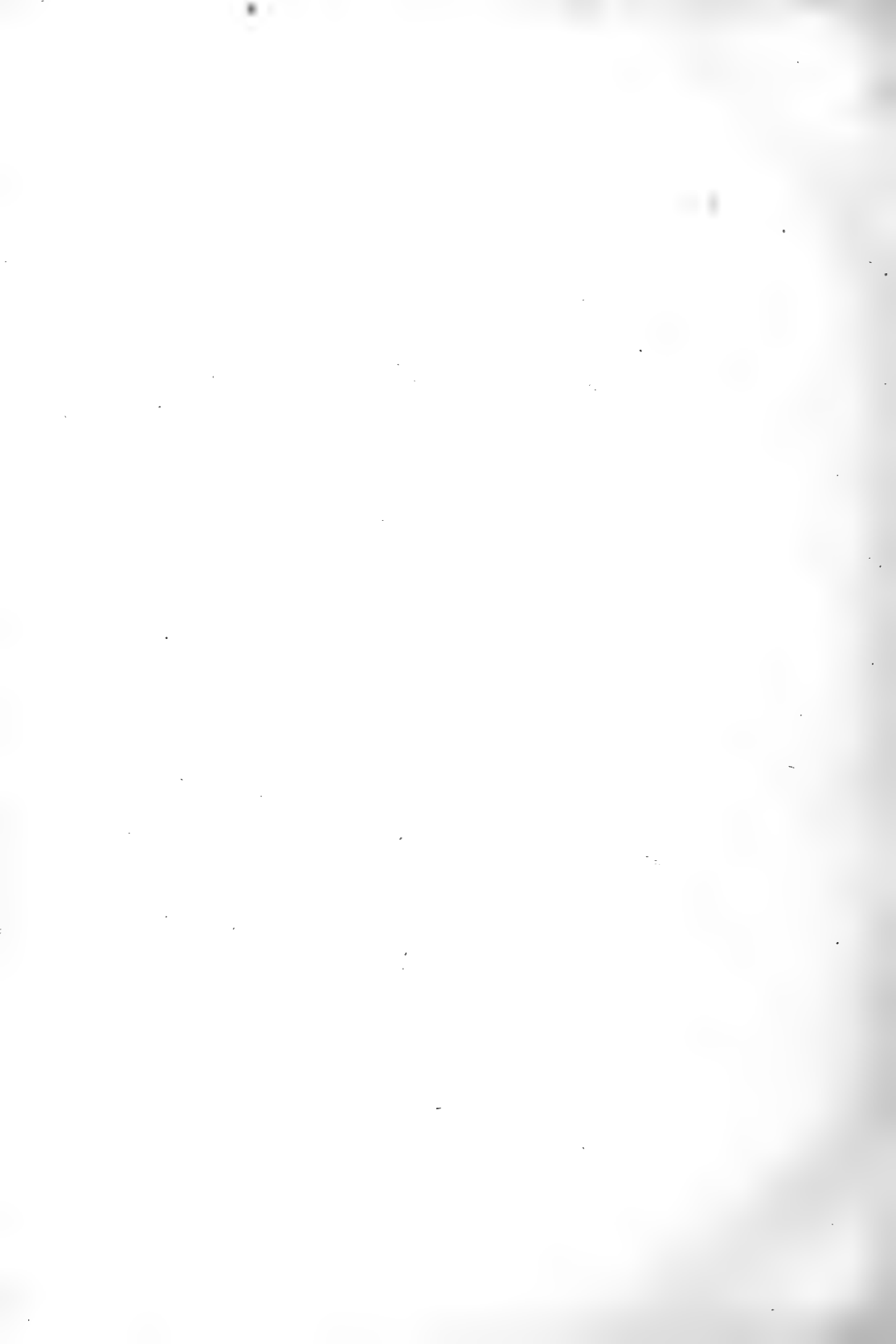


MAP
of the
KINGDOM OF SIAM

showing Zoo-geographical Divisions
and their Boundaries in Red
200 metre contour line in Green
(not shown south of Kra)

Scale = 1 : 20,000,000
Kilom 100 300 500 1000 2000 3000 4000 5000 Kilom
Miles 100 300 500 1000 2000 3000 4000 5000 Miles

- ZOO-GEOGRAPHICAL DIVISIONS —
- 1. Northern Siam.....N.
 - 2. Central.....C.
 - 3. Western.....W.
 - 4. Peninsular.....P.
 - 5. Eastern.....E.
 - 6. South Eastern.....S.E.



plains—we generally find a change in the fauna also, and this is particularly notable in a contrast between the life of the two latter kinds, and is perhaps always best illustrated by the mammals. Siam shows some of these orographical and vegetational differences, and it is in accordance with them that I have attempted to distinguish a number of divisions, about which, however, it is quite impossible to draw sharp boundaries.

Northern Siam, as I have defined it is, on the whole, a mountainous area, and Western Siam is the same. Eastern Siam is, speaking broadly, a sub-montane division of a different formation from the rest of the country, and with a different vegetation. In Central Siam I have endeavoured to include the whole riverine plain, and that only. South-eastern Siam contains both mountains and coastal lowlands ; as does Peninsular Siam, which, from the present point of view, forms naturally a geographical sub-division. I have considered it here, as starting from the gap in the mountains between Koh Lak and Tenasserim, though it might with equal propriety be regarded as commencing at Muang Kra or Pakchan. Though I should have preferred, with the classical instance of Egypt as precedent, to have divided the Menam country into Upper and Lower Siam, I have (in deference to the wishes of several members of the society) used the terms Northern and Central for this area, though the latter name seems scarcely logical since the periphery is incomplete. The other titles require no explanation except that of Peninsular Siam about which a word or two may be said.

American zoologists in reporting on collections from Trang, etc., set the fashion, and are still in the habit of referring to that area as Lower Siam. This practice has been the cause of misunderstanding on the part of other naturalists, and has resulted in a good deal of confusion. For this outlying province I have, therefore, proposed the name of Peninsular Siam, as being especially descriptive, and, of all alternatives, the only one which is absolutely devoid of ambiguity ; which is not the case unfortunately with "southern"—a geographical term of the same class as the others, and complementary to the two names for the river area. If collectors would refer to the above divisions, the stations from which their material came, a very good idea of the provenance of their specimens would be obtained, even though the exact positions could not be located.

MISCELLANEOUS NOTES.

No. I.—ADDITIONS TO THE MAMMALIAN FAUNA OF RATBURI.

During the period December-June 1915 the following mammals were obtained in the Sai Yoke district of Ratburi, additional to the List published in the *Journal* Vol. 1. No. 3.

Presbytis Phayrei. Phayre's Leaf monkey. (Siamese, "Karng")
M. 1. F. 1. with fully developed foetus.

This species was obtained in N. Lat 14° 40' on the range of mountains east of Si-sa-wad (vide Map frontispiece Vol. 1. No. 3.), but was not observed west of that range. Both were obtained in evergreen forest at an elevation of 1000 metres, and probably at the southern limit of the species.

Specimens obtained agreed very closely with Col. Tickell's description and measurements of an adult female obtained east of Moulmein, and in his sketch he emphasizes the dark colour of the hands and feet, as opposed to the light body colour. Blanford, in Fauna B.I., adopted Col. Tickell's sketch for the species, but seems rather uncertain as to whether Col. Tickell's animal may not have been *S. albocinereus*.

Even if the southern form shows no structural difference from the Northern or Arakan type, yet the colour of the southern appears to be constantly lighter. A description of freshly killed specimens is as follows:—

Back, sides, flanks and tail, light silvery grey. Legs and forearms, darker grey. Hands and feet, almost black. Eyebrows and forehead, brownish. Orbital skin, dark bluish. Upper lip from nostrils down, and all lower lip, pinkish flesh-colour. Ears, very dark brown. Callosities, dirty yellow. Inguinal region, bluish white, and female with the triangular sex mark down inners of thighs as in *P. Germaini*. Hair of poll produced into a median crest, the apex of which is slightly in front of ears. Whiskers long, almost concealing ears from the front. Tail slightly tufted.

The male measured as follows:—Length 22.5 in. Tail 30.5 Hand 5. Foot 6.75. The fully developed foetus (obtained 19/5/15) was in colour light fawn or straw colour, the extremity of tail being greyish chestnut.

Arctictis binturong. The Bear Cat (Karang "Ka-cheu"). 1 flat skin. 1 skull.

Both specimens were obtained by surveyors near Sai Yoke, though the Karangs are well acquainted with the animal and state it is generally distributed in evergreen forest.

In 1914 I received a skull from Pachin in Eastern Siam, and Blanford also records the species from Siam. Recently the Bombay N. H. S. Survey has obtained 2 skins without skulls near Tenasserim village.

Blanford states that the head and body measure 28-33 in., tail

26-27, but his skull measurements of an adult female are nearly an inch less both ways than the Sai Yoke skull which measures:—

Sai Yoke skull. Basal length 5.67 in. Zygomatic breadth 3.85
Pachin skull " " 5.3 " " " 3.25

In the skull the number of molar and premolar teeth is variable, but the skull is markedly different from that of any other members of the family Viverridae. The skin may be recognized by the generally coarse black pelage, tufted ears, naked tarsi and long bushy tail.

It is I believe the only Siamese mammal with a truly prehensile tail, and, according to the Karangs, can suspend itself by the tail alone.

Arctonyx collaris. The Hog-badger (Siamese "Moo Ring")
1 Female, Sai Yoke. 1 flat skin, Si-sa-wad.

This full-grown female measured:—Head and body 30.2 in. Tail 10.25 or with hair 13.2. Hind foot 4.2. Height at shoulder 12.5. Ear 1.1. Snout to eye 4.2. Skull, basal 6.05 in. Zygomatic breadth 3.36, and greatest breadth 3.58 in.

Colour. Eye, very small, brown. Snout, yellowish pink; lips, pinkish white. Feet and all body skin, yellowish. Toes broad and mobile. Claws, bear like and grooved, pale horn. General colour of body and tail, dirty yellowish white, the longer body hairs being buff at base and tips, and black in middle. The head, face, ears and a band beneath lower jaw, very dark brown. A whitish patch around eyes, and a yellowish median line from crown to snout. Ears, tipped buff. Fore legs and feet, black from shoulders down, hind feet black, the legs buff and black.

This specimen was obtained (10/6/15) in rocky bamboo jungle. A coolie saw the animal approaching and missed it three times with the 12 bore, and thereupon seized the animal by the tail and broke its back with a stick. This behaviour accords with Col. Tickell's statement that "it is dull of sight, and its only acute sense appears to be that of smell." Two scent glands were found discharging into the post-caudal pocket, the latter formed by the base of the tail which was 2 in. broad. The secretion was brownish yellow, and the hind parts were stained by the flow; and the stench so pervaded the beast that the coolies, to their sorrow, were unable to eat the flesh.

Mr. A. A. Porter obtained a specimen in Raheng district, and Blanford records the species from Tenasserim. The Bombay N. H. S. survey failed to obtain it.

Chiropodomys (gliroides) pequensis. The Burmese Tufted-tailed Tree-mouse.

1 male. This was obtained west of Si-sa-wad at 960 metres elevation, in evergreen jungle. Length 96 mm. Tail 125. Hind foot 20.5. Ear from skull 18.2. Width between ear tips 45 mm.

General appearance. Short broad head and large prominent eyes. Ears almost circular. Feet short, with flat nails on pollex and hallux. *Colour*. Brown above, the lower surface, white. Tail slightly tufted, the longest hairs being on extreme one-third. Blanford records this species from Burmah, and the Bombay N. H. S. Survey has recently obtained a number of specimens in southern Tenasserim.

In addition to the above, specimens of 17 other species already recorded were obtained this year, of which the following are of interest:—

Ursus Malayanus. The Malay Bear (Siamese Mi Mah or Mi Moo).

A large female was obtained with half-grown cub. The female measured:—Snout to vent 42.7 inches. Tail, represented only by a tuft of hairs. Height at shoulder 21 in. Hind leg, vent to heel 15.7. Hand 5.5. Foot 7. Ear 2.5, or from crown 1.6. Snout to base of ear 11 in. Width on crown between ears 8. Circumferences: Chest 33 in. Belly 35. Forearm 12.2. Leg 10.3. Skull. Basal length, 8.22 in. Zygomatic breadth, 7.68. Canines yellow, flat topped (this was the case in the only other Ratburi skull I have examined). Claws grooved, nearly black (Blanford says “pale horn, sometimes dusky”). Muzzle and chin, greyish white. Eye, brown. Palms and soles, dirty flesh colour, slightly haired at bases of digits. I believe mammae should be 3 pairs. I noticed but 2 pairs, the pectoral longest.

Hapalomys longicaudatus. Berdmore's Rat.

A male of this rare rat was obtained at Sai Yoke within 3 miles of where last year's specimen was found (vide *Journal* No. 2. page 115). It measured:—Length 154 mm. Tail 208. Hind foot 29. Fore foot 17. Ear from orifice 13. Vibrissae 55 mm. These measurements accord fairly with those of the specimen taken last year.

In this specimen the lower lip was much drawn back, exposing the incisors almost to the gums, but this may have been due to trapping. The Bombay N. H. S. Mammal Survey recently obtained 2 specimens in southern Tenasserim.

Capricornis sumatrensis milne-edwardsi. The Burmese Goat Antelope.

A nearly full grown female was obtained East of Si-sa-wad measuring:—L. 41 in. Ht. at shoulder, 31. Ht. at withers, 32. Ear from skull, 7.8. Tail without hair, 4.8. Body circumference, 32. Hair of mane, 4.7. Horns, brown, 2. in. (these came away with the skin, having no pedicels). Suborbital glands $\frac{1}{4}$ in. dia., situate 1.75 in front of eyes. Inter-digital glands (orifice $\frac{1}{8}$ dia.) on both fore and hind feet, the secreting bag being 2 in. in length. The secretion had no scent.

Colour. Eye, brown. Naked inners of ears, yellowish flesh colour. Face and cheeks, black, a white stripe extending 2 in. from mouth, a small dull chestnut patch above upper lip. Outers and front bases of ears, the hairs basally black, tipped bright chestnut. Chin, blackish; throat, white and chestnut mixed. Whole body, greyish brown with a plum-coloured tinge—the hairs being basally white, tipped with dark brown or black. Dorsal stripe extending to tail, chocolate brown—the basal half of the hairs being white. Uppers of fore-legs, very dark brown—the hind legs somewhat lighter, but both chestnut from knees and hocks downwards. Tail, naked beneath.

Cervulus feae. Fea's Muntjac. The Black Barking Deer.

Another specimen of this rare deer was obtained within 2 miles of the spot where part of a specimen was procured last year (vide *Journal* No. 2. page 116).

Unfortunately the surveyor who procured the animal, kept only the skin without head or legs. He informed me that he had, in 1912, shot this animal in the Huè Sut Yhai in N. Lat 12°40.'

Sus cristatus. The Indian Wild Boar.

Some doubt has been expressed as to the identification of pig obtained in the Ratburi district; and pigs obtained in lower Tenasserim by the Bombay N. H. S. Mammal Survey have been classified as the smaller species viz:—*Sus jubatus*—the Tenasserim Wild Pig. Unfortunately the weights and measurements of these specimens are not given. The measurements of a boar and sow obtained in Ratburi district are given here, together with those given by Blanford for the Indian species, and it will be seen that Ratburi specimens are well up to the Indian—sows being constantly smaller than boars.

Fauna B.I.	Boar.	Petchaburi. Boar.	Sai Yoke. Sow.	Length	Height	Skull basal	Zygomatic	Weight.
				60 in.	28-36	13.75	7.3	200-300 lbs.
				57 in.	33 in.	—	—	estimated 300.
				52 in.	31½ in.	11.9 in.	5.4 in.	175 lbs.

Further skulls are desirable, with body measurements and weights if possible.

K. G. GAIRDNER.

Oct., 1915.

No. II.—NOTE ON SAMBAR (*CERVUS UNICOLOR*) SHEDDING ITS HORNS.

As there seems to be considerable diversity of opinion as to how often sambar shed their horns, the following may be of interest.

A stag which was caught when a few months old and obtained by the present owner at the age of 2 years, has for the last four years while in his possession shed its horns annually in August.

The horns have not appreciably become bigger with each successive year, but this year they appear to show signs of being larger than before. In 1912 the left horn had an extra tine just above the brow tine, but this has not appeared since.

According the Blandford and Lydekker wild stags in India do not shed their horns regularly every season, and it would be interesting to know in what months sambar with fully developed horns have been shot in Siam.

P. A. R. BARRON.

Nov., 1915.

No. III.—A NEW SNAKE FOR BANGKOK.

Since completing my articles on the Snakes of Bangkok, another species has been added to the list, viz., *Lycodon laoensis*, caught last month beneath some fire-wood at Bangkok Noi. The descriptions of this snake, taken no doubt from museum specimens, give the colour as being "dark brown above, with a whitish cross-band on the occiput

and others on the back, etc." In the Bangkok specimen, as with another from Den Chai, the only two which I have seen alive, these white cross-bands were, during life, of a bright lemon-yellow colour, whilst in the former also, a young specimen, the dark brown was pure black.

MALCOLM SMITH.

October, 1915.

No. IV.—ON THE BREEDING HABITS AND COLOUR CHANGES IN THE LIZARD, *CALOTES MYSTACEUS*.

A pair of these lizards, caught at Paknampo in January of last year, bred whilst in captivity, and afforded me an opportunity of observing their habits during this period. Like other species of the genus *Calotes* in confinement, they were extremely wild and shy, and would never allow themselves to be handled. They fed, however, freely on insects of all sorts. For the first six weeks of captivity, they were evidently too much disturbed to show any colour changes, and remained a mixture of dull greys and browns of varying shades.

The courtship, which was continued until the eggs were laid, was much the same as that described for *C. versicolor*, (Robinson, *P. Z. S.* p. 858. 1899.) and consisted for the most part in absurd bowings and noddings of the head. This was commenced by the male, and was usually, after a short time, responded to by the female. The pair invariably faced each other on these occasions, arching their backs and puffing out their throats to the full extent. The vivid hues assumed by the male (and slightly so by the female) during this performance, transformed him into a truly gorgeous creature. The head and fore-part of the body became of a light electric blue (sometimes green) colour, the gular pouch dark purple, whilst the pale stripe which borders the upper lip, and passes on to the shoulder, turned almost white, and stood out in strong contrast to its surroundings.

They were first observed *in copula* on May 9th, and after that were frequently seen together. On June 21st, I observed the female busy with the earth in the flower pot in the cage. She did not like being watched, and ceased operations as soon as she saw me, but by hiding behind a door I was enabled to observe the rest of the proceedings. The eggs had been already laid, and she was then engaged in covering them up, raking the earth over them with her fore-paws and hammering it down with her nose. The male, perched on a branch above, watched the performance with great interest, and I was surprised to see him, in the midst of it all, suddenly race down to his mate and engage her. She, finally, completed her task, smoothing the earth completely over at the spot, so that no traces were left to show that anything had been done there. I never saw her near the spot again, and she appeared to take no further interest in her progeny. The eggs were placed about 2 inches deep in the earth, and had the usual soft, white parchment-like covering. They were 7 in


number, 15 to 18 × 10 to 11 mm. in size. The first young one appeared on Aug. 20th, and measured from snout to vent 26 mm., tail 48 mm. in length. They had the usual drab colours of their parents.

The colour changes in these specimens, I found, were not brought about by sexual excitement only. Fear would produce exactly the same effect. This could be demonstrated by putting a snake into their cage. Their attitude then was that of being fascinated and unable to escape. They invariably faced the snake, bowing to it and nodding their heads exactly as when courting. The crest was strongly erected, the gular pouch fully distended, and the colours would gradually become more vivid until they were almost as intense as during sexual excitement.

Calotes mystaceus is widely distributed throughout Siam, its handsome colouring usually attracting attention wherever it is found. It has been seen as far South as Hua Hin, but below that Latitude has not yet been recorded. It is not found in Bangkok, or in the country immediately surrounding, but away from the great plain, its haunts and modes of life are similar to those of *C. versicolor* (the common Bangkok "chameleon"), to which, when "off colour," it bears a close resemblance.

MALCOLM SMITH.

Dec., 1915.



PROCEEDINGS OF THE SOCIETY.

3rd ORDINARY GENERAL MEETING.

This was held at the Oriental Hotel on July 14th, 15 members and 2 guests being present. The President read a paper from Mr. Boden Kloss proposing certain Zoo-geographical divisions for Siam, its object being to assist those who were not well acquainted with the country, in locating specimens recorded by members of the Society or other naturalists.

A considerable amount of discussion followed, and the matter was ultimately referred to a sub-committee, who were requested to draw up the proposed alterations, and refer them again to Mr. Kloss before publication in the Journal.

Specimens were exhibited by H. R. H. Prince Chumporn, Mr. Herbert, Dr. Smith, Mr. Gairdner and Mr. Godfrey.

4th ORDINARY GENERAL MEETING.

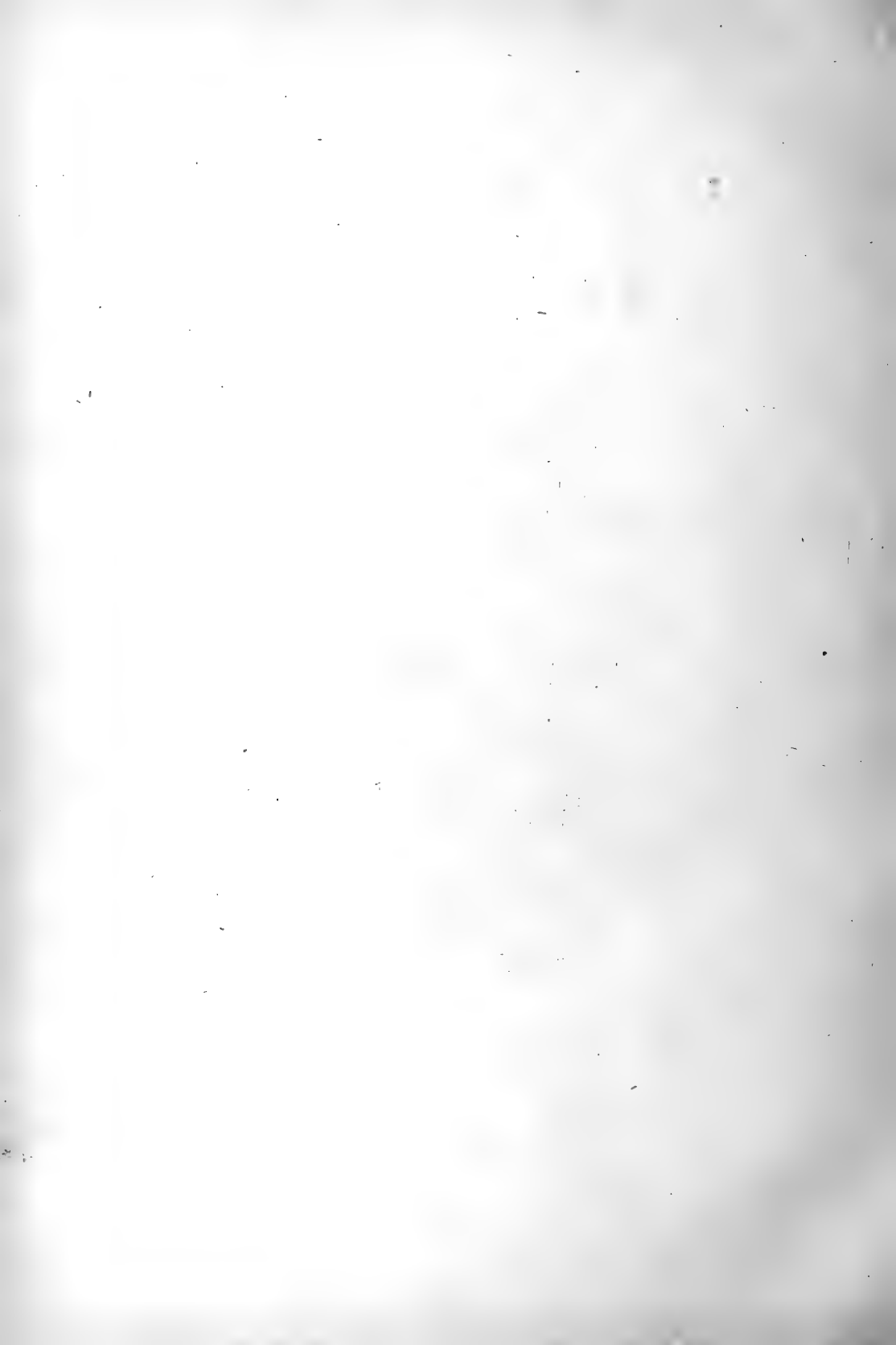
This was held at the offices of the Bangkok Times on December 21st, 11 members and 1 guest being present.

Mr. Herbert and Dr. Smith exhibited an interesting series of mammals, birds, reptiles and batrachians recently taken by their collectors in a expedition to the mountains at Nakon Sri Tamarat. A detailed report of this collection, when it has been fully worked out, will be published in the Society's Journal.

The following publications have been recently received:—
The Fishes of the Indo-Australian Archipelago. Vols. I and II. By Dr. Max Weber and S. L. F. de Beaufort. *The Reptiles of the Indo-Australian Archipelago*. Vol. I. (Lacertilia, Chelonia, Emydosauria). By Dr. Nelly de Rooij. *Java, Zoologisch en Biologisch*. Door Dr. Koningsberger. *Laboratorium voor Plantenziekten*. No 18. *Bulletin du Jardin Botanique de Buitenzorg*. No. XVIII and XX. *Records of the Indian Museum*. Vol. XI. Parts 1 and 2. *Journal of the Federated Malay States Museums*. Vol. VI. parts i, ii and iii. *On Birds collected by Mr. C. Boden Kloss, F.R.G.S., M.B.O.U., on the Coast and Islands of South-Eastern Siam*. By H. C. Robinson, M.B.O.U., C.M.Z.S., with Field Notes by the Collector. *Arkiv för Zoologi*. (Royal Swedish Academy of Science, Stockholm). Band 8, Häfte 1 to 4. Band 9, Häfte 1 and 2. *Arkiv för Botanik*. (Royal Swedish Academy of Science, Stockholm). Band 13, Häfte 1 to 4.

A FURTHER LIST OF PUBLICATIONS RELATING TO THE NATURAL HISTORY OF SIAM.

Author.	Title of Work.	Publisher.
Auguste Pavie.	Mission Pavie Indo-Chine, 1879-95.	Ernest Leroux, 28 Rue Bonaparte, Paris.
Robinson & Kloss	Collection of Mammals, Birds, Reptiles, Batrachians and Plants from Bandon, Koh Sannui and Koh Pennan. (<i>Jour. F. M. S. Museums</i> Vol. V. No. 3.)	Selangor Museum, Kuala Lumpur.
„	On Birds Collected on the Coast and Islands of S. E. Siam (<i>Ibis</i> , Oct. 1915).	
Nelly de Rooij	The Reptiles of the Indo- Australian Archipelago. Vol. I. Lacertilia, Chelonia, Emydosauria, 1915.	E. J. Brill, Leyden.
Max Weber and L. F. de Beaufort.	The Fishes of the Indo-Austra- lian Archipelago Vol. I. 1911, Vol. II. 1913.	„
Various.	Fasciculi Malayenses. Results of an expedition to Perak and the Siamese Malay States, 1901-1902.	Longmans, Green & Co., London.
Barbour.	A contribution to the Zoogeog- raphy of the East Indian Islands Vol. XLIV. No. I. (Reptiles and Batra- chians) 1912.	Harvard College Museum, U. S. A.



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STATEMENT OF ACCOUNTS FOR 1915.

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Bangkok,

9th February, 1916.

(Sd) S. H. COLE,

Hon. Secretary and Treasurer.

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LIST OF PUBLICATIONS IN THE LIBRARY OF THE SOCIETY.

NOTE.—*Members may borrow any of the Publications by personal application at the office of the BANGKOK TIMES, or, in the case of Members not resident in Bangkok, by written application to the Honorary Secretary. All withdrawals and returns must be recorded in the book provided for the purpose. No Publication may be kept for more than one month.*

MAMMALS.

- Anthropology, Guide to, in the British Museum.
Elephants, Guide to (recent and fossil), in the British Museum.
(1908).
Great Game Animals, Guide to, in the British Museum.
Catalogue of Heads and Horns of Indian Big Game (bequeathed
by A. O. Hume, C. B.) in the British Museum. By R.
Lydekker, F.R.S.

BIRDS.

- Birds collected by Mr. C. Boden Kloss, F.R.G.S., M.B.O.U., on the
Coast and Islands of S. E. Siam. By H. C. Robinson, M.B.O.U.,
C.M.Z.S., (Ibis, Oct. 1915).
Birds, Reptiles and Amphibians, List of, in Raffles Museum,
Singapore. (1912).
Birds, Guide to, in the British Museum. (1910).

REPTILES AND BATRACHIANS.

- Reptiles of the Indo-Australian Archipelago. Vol. I. (Lizards,
Tortoises and Turtles, Crocodiles). By Dr. Nelly de Rooij.
(1915).
Snakes, The Poisonous Terrestrial, of our British Indian Domi-
nions. By Major F. Wall. (1907).
Snakes of Bangkok. By Dr. Malcolm Smith. (1915).
Reptiles and Amphibians, List of, in Raffles Museum. (1912).
Reptiles and Amphibians, Guide to, in the British Museum.

FISHES.

- Fishes of the Indo-Australian Archipelago. Vol. I. 1911. Vol. II.
(1913). By Dr. Max Weber and Dr. L. F. de Beaufort.
Fishes, Guide to, in the British Museum.
Poissons d' eau douce de l'Indo-Chine. By Dr. Jacques Pellegrin,
(1907).

INSECTS, ETC.

- Butterflies, Palæarctic, Catalogue of Leech Collection. (1902).
Insects, Guide to the exhibited series of, in the British Museum.
(1909).

House Fly as a danger to health (pamphlet). By Ernest. E. Austen. (1913).

Spiders, Descriptive Catalogue of the, of Burma. By T. Thorell. (1895).

BOTANY.

Flora of Siam, Contributions to the, by Wm. Grant Craib, M.A.
Dicotyledones. (1912). Monocotyledones. (1913).

JOURNALS, PROCEEDINGS, ETC.

Annals and Magazine of Natural History. Vol. XVII. 1916.
(in issue).

Arkiv för Botanik. Vols. XIII, XIV, (1913-1915).

„ „ Zoologi. Vols. VIII, IX, (1913-1914).

Bulletin du Jardin Botanique, No. 18, 20, 21, (1915).

Journal of the Federated Malay States Museums. Vols. I.—VI.
(1905-1916).

Journal of the Siam Society. Vol. XI, (in issue).

Mededeelingen van het Laboratorium voor Plantenziekten. No. 18.
(1915).

Records of the Indian Museum Vol. XI, (1915).

Zoologisch Biologisch. No. 10. (1914).

Handbook of Instructions for Collectors (British Museum).



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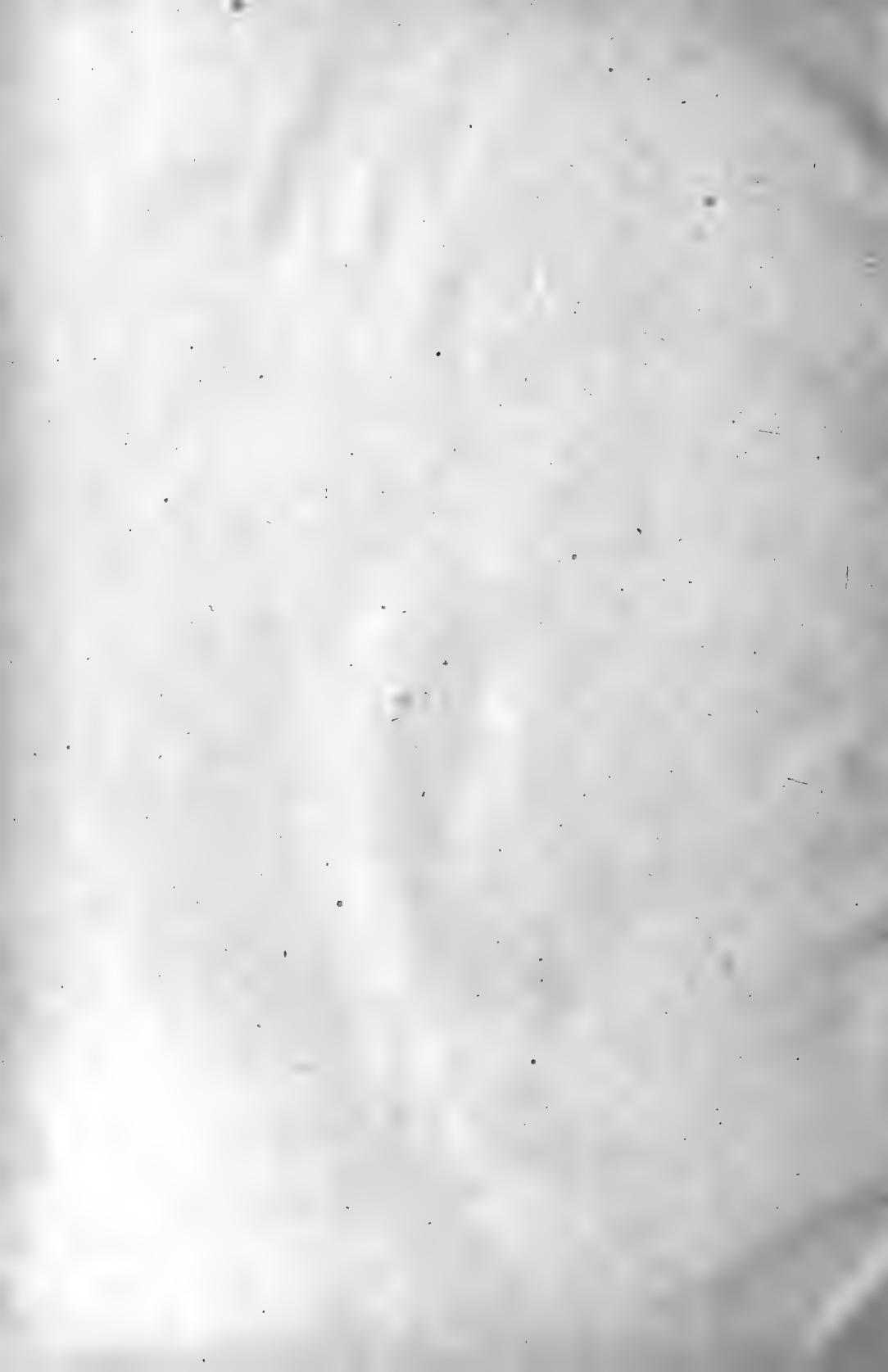
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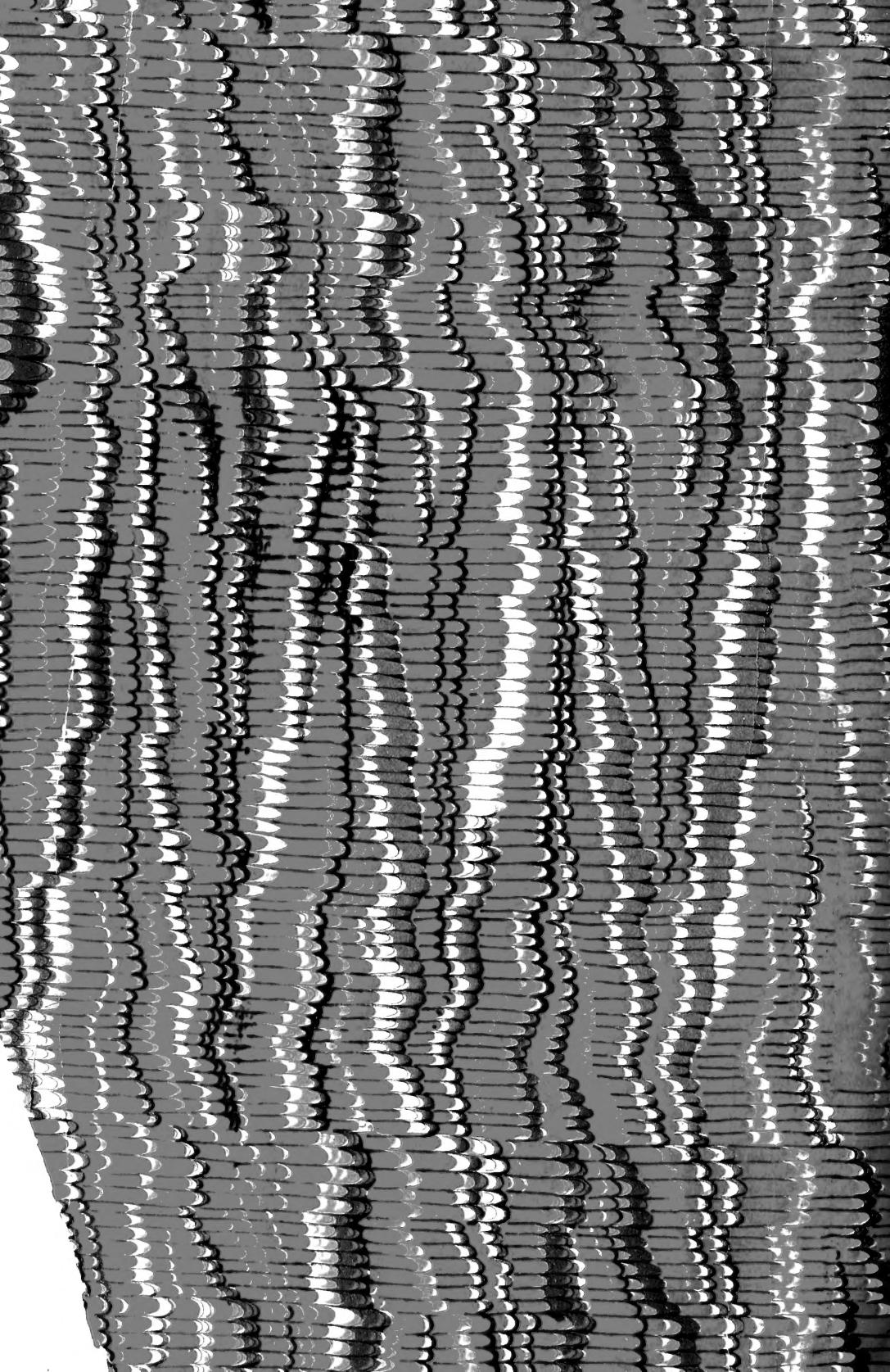


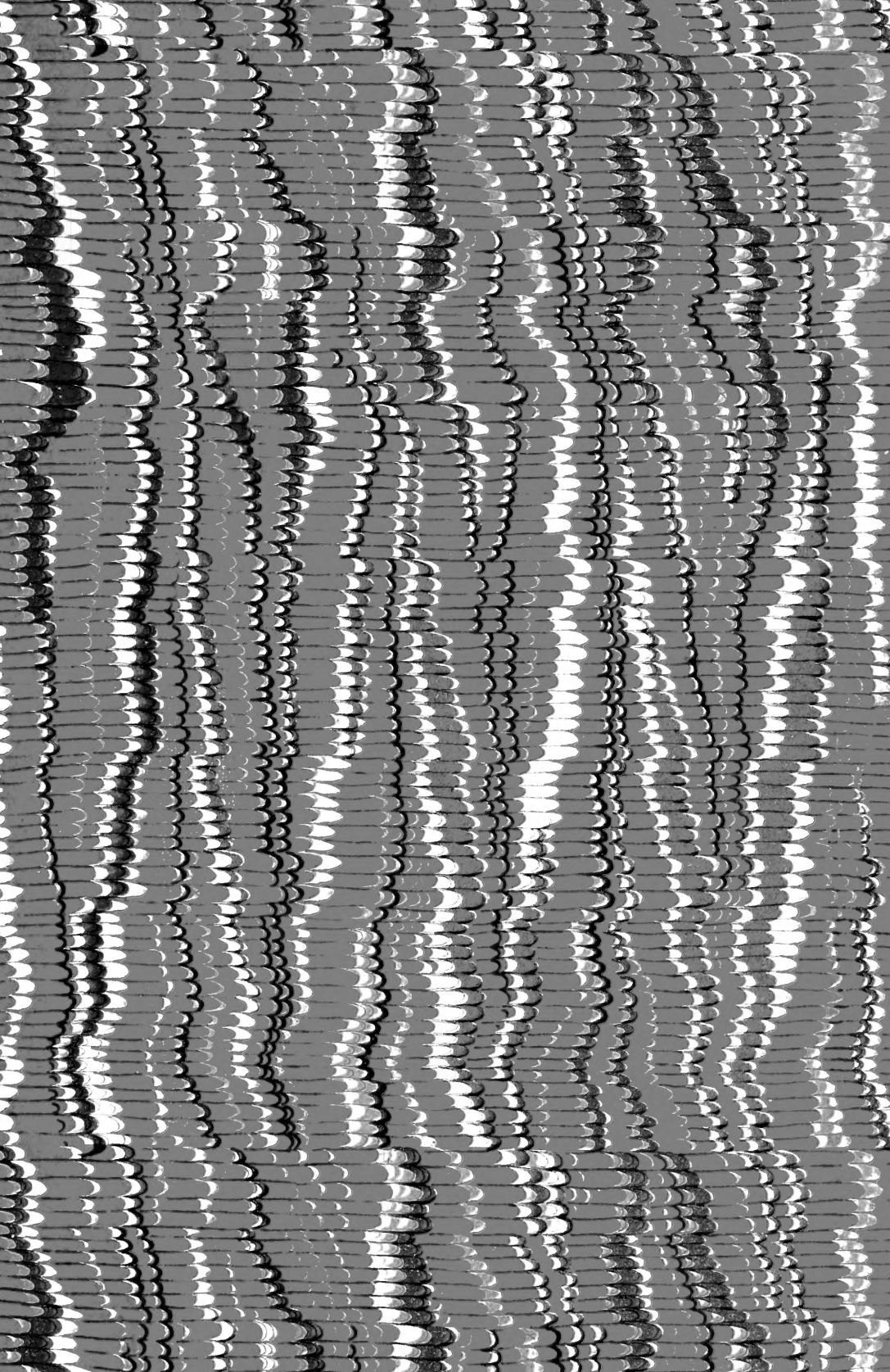












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