

## PREFACE

The present report deals with some 600 specimens of amphibians and reptiles collected by Messrs. F. N. Chasen, Curator, Raffles Museum, Straits Settlements, and H. M. Pendlebury, Systematic Entomologist, Federated Malay States Museums, on Mt. Kinabalu, 13,455 ft. during April and May 1929. It is by far the most extensive collection yet made upon the mountain.

The paper is divided into three parts. The first is a list of the species arranged according to the altitudes at which they were collected. The number after the species-name is the number of specimens collected at that camp and it probably represents the abundance of the species at that altitude.

No reptiles were found above 8,000 feet and no amphibians above 10,300 feet. In comparison with this it may be recalled that on Mt. Korinchi in Sumatra which rises to a height of about 12,400 feet, no amphibians or reptiles were found above 7,500 feet.<sup>1</sup>

Maps of the mountain and the position of the localities at which the different collections were made will be found in the Sarawak Museum Journal, II, p. 137 (1915), and Journ. Linn. Soc., Botany LXII, pl. 1 (1914). A third is given in this "Bulletin".

The second part of the article gives a detailed account of the collection in so far as the material obtained provides fresh information.

The following species are described as new:—

Amphibians. *Leptobranchella baluensis*, *Nectophryne altitudinis*, *Philautus amoenus*, *Ph. spiculatus*.

Reptiles. *Calamaria pendleburyi*, *Trimeresurus chaseni*.

The following changes are made:—

*Phrynoglossus* is revived as a genus and *Oreobatrachus* becomes a synonym of it.

*Osteosternum* becomes a synonym of *Ooedozyga*.

<sup>1</sup> Vide Boulenger, Journ. Fed. Malay States Mus., VIII, Part 2, 1920, pp. 285—296, pl. VIII.

Korinchi Peak is a volcano and its upper areas are much less hospitable to herpetological life than those of Kinabalu which are much better watered. But I believe that the collecting of amphibians and reptiles was more systematically carried out on the latter than on Korinchi Peak.

It will be seen, however, that on Kinabalu reptiles become scarce at 7,300 ft.; only two examples of a snake were secured at Kamborangah—one of which, taken at 8,000 ft., was the highest reptile met with.

At or near Pakka (10,200 ft.) twelve amphibians of only three species were taken, all singly in daylight. Searches with lamps on two evenings produced no result.

A toad sitting in the sunlight at about 10,300 ft. is the altitudinal record for the mountain.

On Korinchi Peak the highest species secured (near the half-way camp at 7,300 ft.) were *Philautus cornutus* (Blgr.) and *Lophocalotes ludekingii* (Blkr.). C. B. K.

*Nyctivalus* becomes a synonym of *Philautus*.

*Philautus flavosignatus* becomes a synonym of *Ph. margaritifera* and *Ph. anodon* of *Ph. pictus*. *Nyctivalus robinsoni* becomes a synonym of *Ph. aurifasciatus*.

*Lygosoma kinabaluensis* is revived as a valid species.

*Calamaria baluensis* and *C. moultoni* become synonyms of *C. grabowskyi*.

A series of water-colour sketches by Mr. Chasen together with notes made by him at the time of collection, have enabled me to describe the living colours of a number of the species.

The third part of the article is a list of all the amphibians and reptiles that have been found upon the mountain from 3,000 feet upwards.

Mr. C. Boden Kloss, Director of Museums, Straits Settlements and Federated Malay States, has permitted me to retain for the British Museum of Natural History the types of the species here described, together with a representative series of specimens from the collection.

The Museum is also indebted to him for the types of the following species which until now have been kept in the Raffles Museum, Singapore:—

*Gekko rhacophorus* Blgr., *Stoliczkaia borneensis* Blgr., *Oreocalamus hanitschi* Blgr., *Cylindrophis lineatus* Blanford, and *Gymnodactylus sworderi* Smith.

Mr. Norman Smedley has pointed out to me that *Gekko rhacophorus* has all the generic characters of *Ptychozoon* except that they are not so markedly developed, and that it would be more correct to place it under the latter genus. I fully agree with this change and in Part III therefore have listed it under *Ptychozoon*.

## PART I.

List of species arranged according to the altitudes at which they were collected.

## Kiau, alt. 3,000 feet

## AMPHIBIANS

*Megophrys nasuta* (Schlegel), 6; *M. gracilis* (Günther), 2; *Bufo leptopus* Günther, 11; *Simomantis latopalmata* Blgr., 1; *Chaperina fusca* Mocquard, 2; *Rana macradon* Dum. and Bib., 1; *R. kuhli* Dum. and Bib., 20; *R. palawanensis* Blgr., 3; *R. luctuosa* (Peters), 25; *R. nicobariensis* (Stoliczka), 1; *R. chalconota* (Stoliczka), 3; *R. jerboa* (Günther), 14; *R. whiteheadi* Blgr., 10; *Rana tuberilinguis* Blgr., 31; *Rhacophorus leucomystax* (Gravenh.), 33; *Philautus pictus* (Peters), 1.

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## LIZARDS

*Gymnodactylus baluensis* Mocq., 2; *Hemidactylus frenatus* Dum. and Bib., 5; *H. garnoti* Dum. and Bib., 1; *Hemiphyllodactylus typus* Blgr., 1; *Gekko monarchus* (Dum. and Bib.), 1; *Draco cornutus* Günther, 3; *D. obscurus* Blgr., 1; *D. fimbriatus* Kuhl, 1; *D. formosus* Blgr., 1; *D. quinquefasciatus* Gray, 1; *Gonocephalus borneensis* Schleg., 2; *Japalura nigrilabris* (Peters), 1; *J. ornata* Lidth, 2; *Calotes cristatellus* (Kuhl), 4; *Tropidophorus beccarii* (Peters), 5; *Mabuya multicarinata* (Gray), 3; *M. multifasciata* (Kuhl), 9; *Lygosoma nieuwenhuisi* Lidth, 2; *L. variegatum* Peters, 4.

## SNAKES

*Sibynophis geminatus* (Boie), 2; *Zaocys fuscus* (Günther), 1; *Natrix saravacensis* (Günther), 1; *N. flavifrons* (Blgr.), 1; *N. chrysarga* (Schleg.), 6; *N. murudensis* M. A. Smith, 1; *Elaphe flavolineata* (Reinw.), 2; *Gongylosoma baliodeira* (Boie), 2; *Calamaria vermiformis* Dum. and Bib., 3; *C. leucogaster* Blkr., 1; *C. pendleburyi* M. A. Smith, 3; *Passerita prasina* (Boie), 1; *Psammodynastes pulverulentus* (Boie), 1; *Amblycephalus laevis* Boie, 1; *Bungarus flaviceps* Reinh., 1; *Naja naja miolepis* Blgr., 3; *Maticora intestinalis* (Laur.), 4; *Trimeresurus gramineus* (Shaw), 6; *T. chaseni* M. A. Smith, 2.

## Kenokok, alt. 3,300 feet

## AMPHIBIANS

*Bufo leptopus* Günther, 20; *Chaperina fusca* Mocq., 1; *Rana kuhli* Dum. and Bib., 4; *R. jerboa* (Günther), 17; *R. whiteheadi* Blgr., 6; *Rana tuberilinguis* Blgr., 1; *Rhacophorus leucomystax* (Gravenh.), 1; *Rh. acutirostris* Mocq., 3; *Philautus petersi* (Blgr.), 4; *Ph. spiculatus* M. A. Smith, 1.

## LIZARDS

*Gymnodactylus baluensis* Mocq., 1; *Japalura nigrilabris* (Peters), 2; *Calotes cristatellus* (Kuhl), 2; *Lygosoma variegatum* Peters, 1.

## SNAKES

*Trimeresurus gramineus* (Shaw), 1.

## Lobang, alt. 4,000 feet

## AMPHIBIANS

*Rana whiteheadi* Blgr., 1; *Rhacophorus leucomystax* (Gravenh.), 1.

## LIZARDS

*Calotes cristatellus* (Kuhl), 2; *Mabuya multicarinata* (Gray), 1.

## SNAKES

*Natrix saravacensis* (Günther), 1; *N. chrysarga* (Schleg.), 1.

## Tenompok, alt. 4,700 feet

## AMPHIBIANS

*Rana kuhli* Dum. and Bib., 1.

## LIZARDS

*Japalura nigrilabris* (Peters), 1.

## SNAKES

*Calamaria leucogaster* Blkr., 2.

## Marei Parei, alt. 5,000 feet

## AMPHIBIANS

*Megophrys monticola* Kuhl and v. Hass., 1; *Philautus petersi* (Blgr.), 1; *Ph. mjobergi* M. A. Smith, 2.

## LIZARDS

*Lygosoma kinabaluensis* Bartlett, 3.

## SNAKES

*Oreocalamus hanitschi* Blgr., 1; *Amblycephalus laevis* Boie, 1.

## Lumu Lumu, alt. 5,500 feet

## AMPHIBIANS

*Megophrys monticola* Kuhl and v. Hass., 3; *M. hasseltii* (Tschudi), 6; *Bufo leptopus* Günther, 18; *Kalophrynus pleurostigma* S. Mull., 2; *Rana jerboa* (Günther), 5; *Philautus tuberilinguis* Blgr., 1; *Philautus pictus* (Peters), 2; *Ph. petersi* (Blgr.), 83.

## LIZARDS

*Gymnodactylus baluensis* Mocq., 1; *Japalura nigrilabris* (Peters), 2; *Lygosoma kinabaluensis* Bartl., 1.

## SNAKES

*Natrix saravacensis* (Günther), 1; *Calamaria vermiformis* Dum. and Bib., 1; *Trimeresurus sumatranus* (Raffles), 1.

## Kamborangah, alt. 7,200 feet

## AMPHIBIANS

*Nectophryne altitudinis* M. A. Smith, 1; *Megophrys gracilis* (Günther), 1; *Leptobranchella baluensis* M. A. Smith, 1; *Bufo leptopus* Günther, 12; *Nectophryne misera* Mocq., 14; *Kalophrynus pleurostigma* S. Mull., 1; *Rana kuhli* Dum. and Bib., 1; *R. jerboa* (Günther), 1; *Philautus petersi* (Blgr.), 12; *Ph. amoenus* M. A. Smith, 2; *Ph. mjobergi* M. A. Smith, 6.

## LIZARDS

*Gymnodactylus baluensis* Mocq., 1; *Japalura nigrilabris* (Peters), 2; *Lygosoma kinabaluensis* Bartl., 1.

## SNAKES

*Natrix murudensis* M. A. Smith, 2.

Pakka, alt. 10,200 feet

## AMPHIBIANS

*Nectophryne misera* Mocq., 4; *N. altitudinis* M. A. Smith, 8;  
*Philautus mjobergi* M. A. Smith, 1.

## PART II.

Detailed account of the collection.

## AMPHIBIANS

*Megophrys monticola**Megophrys monticola* Kuhl & v. Hasselt, Isis, 1822, p. 475.*Megophrys montana* Kuhl in Ferussac, Bull. Sc. Nat. Paris, 1824, II,  
p. 83.*Megalophrys montana*, van Kampen, Amphib. Indo-Austral.  
Archipel., 1923, p. 8.

Lumu Lumu 3 ex., Marei Parei 1 ex.

I can see no reason for rejecting *monticola* as the correct name of the species usually known as *montana*. The reference to it in 1824 is nothing more than a French translation of the letter which had already appeared in 1822 except that the name *montana* is substituted for *monticola*. The description is slight, but the indications are sufficient "Kantige Kopfbildung und ein hohes membranoses Horn über jedem Auge", and subsequent authors have never disagreed as to what species was intended.

*Megophrys gracilis*

Kiau, 2 exs., Kamborangah, 1 ex.

Colours of the Kamborangah specimen in life. "Dark brown above, conspicuously banded darker on outer side of limbs. Ventrally, yellowish white on throat, chest and abdomen, tinged with red at the axilla. Waist and underside of hind-limbs crimson."

*Leptobranchella baluensis*, sp. nov.

Plate I, fig. 4.

A single specimen from Kamborangah.

Description of the type. Tongue not nicked behind; head as broad as long, snout broadly rounded, as long as the eye, not projecting beyond the lower jaw; nostril nearer the tip of the snout than the eye; canthus rostralis distinct; loreal region nearly vertical, feebly concave; interorbital space broader than upper eyelid; tympanum distinct, two-thirds the diameter of the eye and distant from it by half its own diameter. Fingers moderate, their tips dilated; first finger much shorter than second which is longer than

the fourth and considerably shorter than the third; a large inner carpal tubercle. Toes webbed at the base, their tips dilated like those of the fingers; fifth toe shorter than the third; no subarticular tubercles; a flat, inner metatarsal tubercle. The tibio-tarsal articulation reaches to the tip of the snout. Skin smooth except on the flanks where there are coarse granules; a fold from the eye to the shoulder.

Dark greyish-brown with blackish markings, namely a bar between the eye, a W-shaped mark on the shoulders and a  $\Lambda$ -shaped one on the loins; sides of the head blackish and narrow black cross-bars on the limbs; below whitish, heavily peppered with dark brown.

From snout to vent 16 mm.

The following characters will serve to distinguish the two species now included in the genus.

Tongue feebly nicked behind; second and fourth fingers equal; loreal region oblique .....*mjobergi*.

Tongue not nicked behind; second finger longer than fourth; loreal region nearly oblique .....*baluensis*.

I have re-examined the types of the genus in comparison with this new species and feel convinced that the pupil in life is round and not vertical as originally stated (Journ. Sarawak Mus., III, 1925, p. 13). The generic description therefore should be amended on this point.

*Bufo leptopus*

Many specimens from Kiau, Kenokok, Kamborangah and Lumu Lumu.

The largest male measures 40 mm. from snout to vent; the largest female 64 mm.

The closely allied *Bufo penangensis* has been recorded from Kina Balu by Mocquard and there are specimens referred to *penangensis* in the British Museum collection obtained by Everett and Hanitsch. I have carefully compared these specimens with typical *penangensis* from Penang and the Malay Peninsula and with the large series of *B. leptopus* obtained by Messrs. Chasen and Pendlebury with the result that I refer all the Kina Balu material to *leptopus*. The degree of webbing of the toes is variable but is always less in *leptopus* than in *penangensis*. *B. leptopus* has also a longer leg, less warty skin, browner coloration, and grows to a larger size. *B. penangensis*, as far as I am aware does not exceed 37 mm. from snout to vent. Van Kampen gives 50 mm. but is possibly confusing it with *leptopus*.

The only published record of *penangensis* from Borneo is the one given from Kina Balu. There is however a single example from Bidi district, Sarawak, in the British Museum collection which I refer to this species.

*Nectophryne misera*

Many specimens from Kamborangah and four from Pakka (alt. 10,200 feet). With *Nectophryne altitudinis* it shares the honour of being the highest ranging amphibian upon the mountain. Mr. Chasen remarks of the colours in life. "Black; ventral tubercles usually white; sometimes marbled with large white blotches."

*Nectophryne altitudinis*, sp. nov.

Plate I, fig. 1.

Description of the type. Adult female, with ripe ova, collected at Pakka, alt. 10,200 feet.

Body moderately stout, limbs moderately slender. Head broader than long, snout rounded, a little longer than the eye, truncate in profile; canthus rostralis distinct; loreal region nearly vertical, concave; interorbital space broader than upper eyelid; tympanum distinct, two-thirds the diameter of the eye. Fingers obtuse at the tips; first finger a little shorter than second, the web between them extending half way up the digits; second finger shorter than fourth; outer three fingers webbed at the base; tips of toes obtuse like the fingers; third toe a little shorter than fifth; toes nearly fully webbed, the membrane reaching the tips of all except the fourth which has a membranous fringe along the last two phalanges; two flat metatarsal tubercles; no tarsal fold; the tarso-metatarsal articulation reaches to the shoulder.

Upper parts with small warty tubercles; belly and throat with small, flat rounded tubercles.

Blackish above, the vertebral region browner; flanks, throat and belly blackish, the latter uniform or with small yellowish or whitish spots; limbs yellowish-brown below.

From snout to vent 46 mm.

Variation. Seven more females were collected in the same locality as the type. They show the following variation. The head may be as long as broad; the tympanum only half the diameter of the eye. The tibio-tarsal articulation may reach a little beyond the shoulder; the third and fifth toes may be of equal length and the web between them more emarginate and not extend to the tips. In some individuals the yellow coloration of the thighs and arms extends on to the belly.

A single male specimen was collected at Kamborangah, alt. 7,200 feet. From snout to vent its length is 26 mm.

*Nectophryne altitudinis* is related to *N. guentheri* and *N. everetti*, from both of which it differs in the more truncate snout, the obtuse digital discs and in many other smaller characters. The first specimen captured was seen sitting in the morning sun at an altitude of about 10,300 feet. The eggs of this toad are few in number and large in size, the vitelline sphere measuring 3 mm. in

diameter. An examination of the stomach contents showed fragments of beetles and small crustacea among other things.

*Phrynoglossus baluensis*

*Oreobatrachus baluensis*, Boulenger, Ann Mag. Nat. Hist., (6) XVII, 1896, p. 401, pl. XVII; van Kampen, Amphib. Indo-Austral. Archipel., 1923, p. 229.

*Oreobatrachus baluensis* was described from a single individual obtained on Kina Balu by Dr. R. Hanitsch. The present collection contains 15 more specimens, all from Kiau, alt. 3,000 feet.

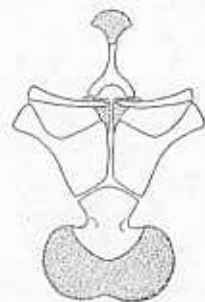
There is not much to add to the original description of the species. A slight tarsal fold is present and the tibio-tarsal articulation in many examples does not extend beyond the anterior border of the eye.

The dorsal coloration of most of the specimens is very dark grey, but two males are pale grey in colour with a broad dark vertebral band. Some have a pale brown splash upon the occiput.

Males are smaller than females. The largest male is 22 mm. from snout to vent, the largest female 33 mm.

The male has a subgular vocal sac, the openings being by slits on the floor of the mouth mid-way between the tongue and the angle of the jaw. The eggs are strongly pigmented. They measure 2 mm. in diameter.

The genus *Oreobatrachus* has been distinguished from *Ooicidozyga* (*Oxyglossus* auct.) by the presence of a bony style to the sternum and a transverse dermal fold in front of the pharynx. No such fold however is to be found in the present series and an examination of the type specimen shews that it is a corrugation of the mucous membrane at that point and not a true dermal thickening.



1  
Sternal Apparatus of  
*Ooicidozyga*.



2  
Tongue of  
*Phrynoglossus*.



3  
Tongue of  
*Ooicidozyga*.

The sternum has a bony style as stated, but so also has the sternum of *Ooeidozyga*. The generally accepted definition that this genus has a cartilaginous sternum is not correct, both *O. lima* and *O. laevis* having well developed bony styles. In some examples of *O. lima* the ossification is not very dense and the style might be missed if the sternal apparatus was not dissected out; in the stained preparation it is very clear.

The tongue of *O. lima* however differs so distinctly from that of the other members of the genus, that I propose to retain it in a genus by itself: the recently described *Osteosternum* will become a synonym of it. For the remaining species now placed under *Ooeidozyga* the name *Phrynoglossus* is available, with *Oreobatrachus* as one of its synonyms. The two genera will now stand as follows:—

#### Genus *Ooeidozyga*

*Ooeidozyga* Kuhl & v. Hasselt, Isis, 1822, p. 475—*Ooeidozyga* Kuhl in Bull. Sc. Nat. Geol. Paris, II, 1824, p. 83.—*Oxydozyga* Tschudi, Mem. Soc. Sc. Nat. Neuchatel, II, 1838, p. 85 (type *lima*).

*Oxyglossus* (not of Swainson 1828) Tschudi, Mem. Soc. Sc. Neuchatel, II, 1838, p. 85 (type *lima*).

*Osteosternum* Hsien Wen Wu, Contr. Biol. Lab. Sci. Soc. China, Nanking, V (2), 1929, p. 1 (type *amoyense*).

Tongue pointed and extensively free behind; no vomerine teeth; omosternum forked at the base; sternum with a bony style; tympanum hidden; digits pointed, toes extensively webbed.

Species. *Ooeidozyga lima* (Tschudi).

#### Genus *Phrynoglossus*

*Phrynoglossus* Peters, Monatsb. Akad. Berlin, 1867, p. 29 (type *martensi*).

*Microdiscopus* Peters, idem, 1877, p. 422, pl. (type *sumatranus*).

*Oreobatrachus*, Boulenger, Ann. Mag. Nat. Hist., (6) XVII, 1896, p. 40, pl. XVII (type *baluensis*).

Tongue rounded or feebly nicked behind, free in its posterior third only; no vomerine teeth; omosternum forked at the base; sternum with a bony style; tympanum hidden; digits with discs; toes webbed.

Species. *P. laevis* (Günther); *P. baluensis* (Boulenger); *P. semipalmatus* (M. A. Smith); *P. celebensis* (M. A. Smith); *P. floresiana* (Mertens).

#### *Rana luctuosa*

A large series was collected at Kiau. Three tadpoles obtained differ somewhat in coloration from the description. The basal half of the tail is mottled with black and yellow these markings then terminating abruptly leaving the distal half of the tail of a more or less uniform pale brownish colour.

#### *Rana jerboa*

Many specimens from Kiau, Kenokok, Lumu Lumu and Kamborangah. Two forms can be differentiated in this series.

One has a slightly narrower head and slightly longer leg. Its colour is brownish above, the hinder part of the thighs being marbled with dark brown and yellow. This form agrees with the typical one from Matang.

The other has a somewhat broader head and slightly shorter leg. In colour it is greyer and the back of the thighs are thickly powdered with dark brown upon a lighter ground. Intermediate examples however connect the two forms completely.

#### *Rana whiteheadi*

Colours in life. "Above dark green except hind limbs which are brownish. Head and trunk spotted with bright yellow. Under-side of trunk silvery white; limbs brownish".

#### *Rana chalconota*

Kabayau (at the foot of the mountain) 1 ex., Kiau, 2 exs. The Kabayo specimen in life was "brownish olive above, back of thighs reddish spotted with black. Belly Chinese-white, brown under the arms, reddish under the legs. Web of toes black".

#### *Rana tuberilinguis*

*Stauriois tuberilinguis*, van Kampen, Amphib. Indo-Austral. Archipel., 1923, p. 237.

Thirty-one examples from Kiau, one from Kenokok, one from Lumu Lumu.

All agree in having a lingual tubercle and no vomerine teeth. The tibio-tarsal articulation reaches to the tip of the snout.

The colour in life of the specimen from Kenokok was "entirely bright green, paler below".

#### *Simomantis latopalmata*

A single male specimen from Kiau.

The vocal sacs appear externally as very distinct folds of skin on either side of the throat below the angle of the jaws. There is a grey nuptial asperity on the first finger. From snout to vent 46 mm.

#### *Rhacophorus acutirostris*

Three examples from Kenokok.

One in life was coloured "olive above; pale orange below. Flanks with irregular black patches; hind limbs mostly brown with dark brown patches." Another was "greyish olive above; whitish below. Flanks and thighs broadly blotched with bright yellow and black."

*Rhacophorus pardalis*

One specimen from Kabayau at the foot of the mountain, alt. 600 feet. Not previously recorded from Kina Balu.

The colours in life were as follows:—"Brown above, with irregular reddish and blackish markings; flanks yellow, spotted with black. Limbs light brown above, yellow on the inner aspects. Underparts dull yellow, webs geranium-pink."

*Philautus amoenus*, sp. nov.

Plate 1, fig. 3.

Description of the type. Female collected at Kamborangah. Head moderate, broader than long. Snout rounded, as long as the eye, not projecting beyond the lower jaw; nostril a little nearer the tip of the snout than the eye; canthus rostralis fairly distinct; loreal region oblique, feebly concave; inter-orbital space broader than upper eyelid; tympanum feebly distinct, one-third the diameter of the eye.

Fingers rather short, free, with large discs, those of the outer fingers being larger than the tympanum; first finger much shorter than second which is much shorter than fourth, third finger longer than the snout, twice as long as the second. Toes one-third webbed, their discs smaller than those of the fingers; third toe as long as the fifth; subarticular tubercles moderately developed, an indistinct flat inner metatarsal tubercle; the tibio-tarsal articulation reaches the eye. Skin of the upper parts smooth, of the throat and belly granular.

Very dark brown above with whitish (yellow in life) spots or markings more or less connected to each other and forming a definite pattern, namely an oval patch on the nape, an elongated one down the middle of the back and a band along either flank; a white bar between the eyes and white spots on the lips; limbs banded with dark brown and white. Below whitish, heavily powdered with brown.

From snout to vent 24 mm.

A second specimen, juvenile, from the type locality agrees well with the type, except that the markings upon the upper parts are less broken up and the under parts are dark brown with a few white spots.

Allied to *Ph. mjobergi* from which it differs in the shorter hind limb and very distinctly in colour pattern.

*Philautus pictus*

*Ixalus pictus*, Peters, Monatsber Akad. Berlin, 1871, p. 580.

*Philautus pictus*, van Kampen, Amphib. Indo-Austral. Archipel., 1923, p. 269 (terra typ. Sarawak, Borneo).

*Rhacophorus anodon* van Kampen, Weber's Zool. Ergebn. Leiden, IV, 1907, p. 400—*Philautus anodon*, van Kampen, Amphib. Indo-Austral. Archipel., 1923, p. 271 (terra typ. Kaju Tanem, Sumatra).

Kiau, 1 ex., Lumu Lumu, 2 exs.

The genus *Nyctixalus*, type *margaritifera*, was erected by Boulenger on a single male specimen in the possession of the Royal Museum of Brussels (Ann. Mag. Nat. Hist., (5) X, 1882, p. 35). It was said to have a vertical pupil. The specimen was purchased as being from the East Indies and unfortunately cannot now be found. Three years later however the British Museum collection acquired a male frog from Java which Dr. Boulenger identified as his *Nyctixalus margaritifera*. The pupils of this specimen are rather widely dilated but are certainly not vertical, and except for a slightly shorter leg and shorter web to the toes, this specimen agrees with the frogs collected on Kina Balu which I refer to *Philautus pictus*. The general habitus and colour pattern of this frog are unusual and characteristic and there is no reason to think that Boulenger was mistaken in identifying the Javan frog as his *N. margaritifera*. Moreover he later on suppressed Boettger's *Philautus flavosignatus* under his *N. margaritifera*, a fact which he recorded in his copy of Cat. Batr. Sal., 1882, but apparently did not publish.

The second species in the genus *Nyctixalus*, namely *N. robinsoni* (type locality, Tjibodas, Java), rests upon a single specimen which is in the Indian Museum, Calcutta; through the kindness of Dr. Prashad I have recently been able to examine it and have no hesitation in identifying it with *Philautus aurifasciatus* (Schlegel). The specimen is rather sodden but is otherwise in a good state of preservation. The pupils are diamond-shaped with the long axis horizontal.

*Nyctixalus* therefore agreeing in all generic characters with *Philautus* should become a synonym of it. My statement in van Kampen's Amphib. Indo-Austral. Archipel., 1923, p. 277 that *Nyctixalus* has no intercalary ossification is an error on my part.

To conclude the story *Philautus flavosignatus* (Peters) will become a synonym of *Philautus margaritifera* (Boulenger) and *Nyctixalus robinsoni* Annandale a synonym of *Philautus aurifasciatus* (Schlegel).

Whether *Ph. margaritifera* from Java should be considered distinct from *pictus* (Borneo, Sumatra and the Malay Peninsula) is doubtful, the character which separates them being only the extent of web to the toes. In the former this is at the base only, in the latter the toes are about one-third webbed. It would probably be more correct to regard the species as races.

Van Kampen has separated his *Ph. anodon* on account of its smooth skin and the skin being adherent to the skull. I find a smooth skin in a specimen of *pictus* from Kuching, Borneo (B. M. coll.) while the ossification of the skin over the fronto-parietal region appears to be an adult character and is present both in *pictus* and in *margaritifera*.

The males of *pictus* and of *margaritifera* are without vocal sacs.

*Philautus spiculatus*, sp. nov.

Plate 1, fig. 2.

Description of the type. Head broader than long; snout obtusely pointed, as long as the eye; nostril nearer the tip of the snout than the eye; canthus rostralis distinct, curved; loreal region very oblique, concave; interorbital space broader than upper eyelid; tympanum distinct, half the diameter of the eye.

Fingers moderate, webbed at the base, with large discs, those of the outer fingers being as large as the tympanum; first finger much shorter than second which is much shorter than fourth; third finger longer than the snout, not twice as long as second. Toes half webbed, their discs smaller than those of the fingers; third toe as long as the fifth; subarticular tubercles moderately developed; an indistinct inner metatarsal tubercle. The tibio-tarsal articulation reaches well beyond the tip of the snout. Skin of the upper parts smooth, of the throat and belly coarsely granulate; a series of conical tubercles along the back of the arm, the flank, the back of the thigh and foot, one at the knee and one at the heel; a patch of rounded tubercles below the vent.

Greenish above with reddish patches; a dark W-shaped mark on the shoulders and dark transverse markings across the top of the head and snout; limbs with dark cross-bars, below white speckled with dark brown.

From snout to vent 30 mm.

A single female specimen from Kenokok.

Allied to *Ph. longicrus* and *Ph. jacobsoni*, from both of which it differs in the larger head and the conical tubercles along the limbs and body as well as in coloration.

*Philautus petersi*

Mr. Chasen remarks that it was the commonest amphibian upon the mountain. Its coloration and markings are as variable as they are in its Javan representative *Ph. aurifasciatus*.

The male has a large subgular vocal sac, the openings being on the floor of the mouth on either side near the angle of the jaw. The eggs in a female 30 mm. from snout to vent measure 3 mm. in diameter.

The largest male is 22 mm. from snout to vent, the largest female 33 mm.

*Philautus mjobergi*

*Philautus mjobergi* M. A. Smith, Journ. Sarawak Mus., III, 1923, p. 11, pl. 1.

*Ph. mjobergi* was described from specimens obtained on Mt. Murud at 7,000 feet altitude. The present collection contains a single specimen from Marei Parei, 5,000 feet, 6 from Kamborangah, 7,200 feet, and one from Pakka at 10,200 feet altitude. They agree well with the Mt. Murud specimens, but their separation from some examples of *Ph. petersi* is not always easy owing to individual variation.

*Kalophrynus pleurostigma*

Kamborangah, 1 ex., Lumu Lumu, 2 exs.

The Kamborangah specimen has a bright axillary ocellus which is coloured like the usual inguinal one.

Kamborangah, 7,200 feet, is a remarkably high altitude for a species which is also found at sea level. The webbing of the toes in this individual is less than in other Bornean specimens, which have almost fully webbed feet, but in other respects it does not differ from them.

*Chaperina fusca*

*Sphenophryne leucostigma*, M. A. Smith, Journ. Sarawak Mus., III, 1923, p. 8.

*Sphenophryne fusca*, M. A. Smith, Bull. Raff. Mus., No. 3, 1930, p. 124.

Kiau, 2 exs., Kenokok, 1 ex.

In a paper now in course of preparation Mr. Parker has shewn that on the characters of the skull the genus *Chaperina* should be retained.

LIZARDS

✓ *Gymnodactylus baluensis*

✓Kiau, 2 exs., Kenokok, 1 ex., ✓Lumu Lumu, 1 ex., ✓Kamborangah, 1 ex.

Three are males. They have 7, 9, and 9 preanal pores respectively, but no femoral, although some of the enlarged femoral scales shew pits.

The enlarged transverse subcaudal plates may be complete or divided into two.

*Hemiphyllodactylus typus*

A single specimen of this rare gecko was obtained at Kiau. It agrees well with Bleeker's description.

✓ *Draco cornutus*

One male and two females from Kiau.

The patagium of the male is deep, dull red in colour, that of the female orange or greyish with the usual markings. The male gular sac is a little longer than the head and is covered with very small scales; it is lemon-yellow in colour and there is no indication that it was red in life as stated in the description. The female has a longitudinal fold on the throat, but there is no trace of any pouch.

✓ *Japalura ornata*

Plate II, fig. 2.

Two adult male specimens from Kiau.

The rostral appendage is about as long as the eye-opening, it projects vertically upwards but is flaccid and can be bent in any direction. The oblique fold in front of the shoulder is barely indicated and there is no transverse gular fold. The limbs are very long and slender, the hind one reaching to well beyond the tip of the snout.

Colour. Light brownish above and below without any other evident markings.

The tail is broken in both examples, but another male in the British Museum collection measures, as follows:—Head and body 55, tail 115 mm.

✓ *Japalura nigrilabris*

✓ Kiau, 1 ex., ✓ Kenokok, 1 ex., Tenompok, 1 ex., Lumu Lumu, 1 ex., ✓ Kamborangah, 2 exs.

The Kenokok specimen was coloured in life as follows:—“Bright green above, freckled on the dorsum with black; greenish white below. Three orange spots on the upper lip and a few above the eyes and on the sides of the head. Throat broadly striped with orange. Four indistinct broken transverse bands on the body”.

✓ *Tropidophorus beccarii*

*Tropidophorus beccarii*, M. A. Smith, Proc. Zool. Soc. London, 1923, p. 777 and Journ. Sarawak Mus., III, 1925, p. 13.

Four specimens from Kiau.

The number of scale-rows at mid-body is as follows:—

♂ 36; ♀ ♀ 36, 34, 32.

*T. mocquardi* as I have pointed out in the references given above, should be regarded as a synonym of *T. beccarii*. The variation in the number of scale-rows in the species over its whole range is from 28 to 36. It is unlikely that the full variation will be found

in any one locality, each district having a limited variation (2 to 4 scales) together with slight differences in coloration. The character of the prefrontals, whether in contact with, or separated from, one another, and the number of loreals, whether one or two in a series, is of no value in this species.

The variation in the number of scale-rows in the British Museum collection is as follows:—

Kina Balu. ♂ 36, ♀ ♀ 36, 34, 32, 32.

Kina Balu. ♂ 36, ♀ ♀ 34 (types of *T. mocquardi*).

Matang, Sarawak. ♀ ♀ 30, 30.

Baram River, Sarawak. ♂ 28, ♀ 28.

Akar River, Sarawak. juv. 28.

Bidi, Sarawak. juv. 36.

✓ *Tropidophorus brookei*

One example from Kabayo, near the foot of the mountain. It has not previously been recorded from the region of Kina Balu.

The variation in the number of scale-rows at mid-body, when more material is available, will probably be similar to that of *T. beccarii*.

The British Museum collection shews the following variation.

Kina Balu, ♂, 36; Sandakan, ♀ 36; Lawas, ♀ 34; Mt. Dulit, ♂, 32; Akar R., ♀, 34; Sarawak, ♀ 32, (type), ♂, 32. The Matang specimens recorded by me in Journ. Sarawak Mus., III, 1925, p. 13, were 30 and 32 respectively.

✓ *Lygosoma nieuwenhuisi*

de Rooy, Rept. Indo-Austral. Archipel., I, 1915, p. 202.

Two examples from Kiau.

Previously known from a single specimen obtained at Long Bloe, in Northern Dutch Borneo.

The following details supplement the original description. 24 or 26 scales round the middle of the body, the vertebrae (2 to 4 rows) larger than the others. Distance between the end of the snout and the axilla  $1\frac{1}{2}$  times in distance between the axilla and the groin. Twenty smooth lamellae under the fourth toe.

Colour in alcohol. Back light brownish-green with strong metallic gloss, and numerous scattered black spots and black edgings to most of the scales; base of tail above with black transverse bands; top of head browner than the back, the scales strongly outlined with black; below light steel bluish or greenish.

Head and body 72; tail 90 mm.



✓ *Lygosoma variegatum*

Kiau, 4 exs.

The number of scale-rows at mid-body is 46, 46, 46 and 48 respectively, but owing to crowding and irregularity of the lateral scales an exact count is difficult. The number is slightly higher than has previously been recorded for *variegatum*, but I have no hesitation in referring these specimens to that species. Twelve examples from Borneo in the British Museum collection show the following variation:—Sarawak, 40, 40, 40, 44; Balingean, coast of Sarawak, 44, 46; Mt. Dulit, 44; Borneo (no definite locality) 40.

Bartlett (Croc. Liz. Borneo Sarawak Mus., 1895, p. 94) has given the living colours of this lizard, and as they are not usually known they may be repeated here. "Male. Above dull brown, marbled, and with two longitudinal rows of unequal sized spots down the back; chin, throat and breast deep cobalt-blue; paler blue on the chest and belly; under sides of fore-arms, vent and hind-legs, dirty yellow; under surface of tail, French-grey or bluish-grey. Female. Above like the male; chin and throat whitish; whole of under parts including limbs, bright yellow; under side of tail, bluish grey. She is the most beautiful of all the lizards found here. In old males, the cobalt blue of the throat is very brilliant."

✓ *Lygosoma kinabaluensis*

*Lygosoma kinabaluensis* Bartlett, Croc., Liz. Borneo, Sarawak, Mus., 1895, p. 96.

Marei Parei, 3 exs. ✓ Lumu Lumu, 1 ex., Kamborangah, 1 ex.

*Lygosoma kinabaluensis* was briefly described by Bartlett as being "similar to *L. variegatum*, but the back mottled and without striations and without a distinct dorso-lateral band. This small species is quite distinct, therefore I name it to distinguish it from the others at present, until I can procure more specimens. Being a spirit specimen I am unable to give decided colours. Kina Balu, N. Borneo (G. D. Haviland)." De Rooy has referred it, with a query, to the synonymy of *L. variegatum*. Fortunately the type is still available and through the kindness of Mr. Banks, Curator of the Sarawak Museum, it has now been presented to the British Museum.<sup>1</sup>

<sup>1</sup> Mr. E. Banks informs me that the types of the following species described by Bartlett are no longer in the Museum collection, nor are they even listed in the Reptile Catalogue started by Bartlett's successor Mr. Shelford: A List of the Reptiles of Borneo, Journ. Straits Branch, R. Asiat. Soc., No. 35, 1901, pp. 43—68.

In Croc. Liz. Borneo, Sarawak Mus., 1895, pp. 73—96: *Draco affinis*, *D. nigriappendiculatus*, *D. grandis*, *Alabina Lewisii*, *M. rubricollis*, *M. sarawacensis*. In Note Book of Sarawak, 1895, p. 42: *Trionyx pecki*.

All these species have been sunk by de Rooy in Reptiles of the Indo-Australian Archipelago, I, 1915, either with or without a query, and presumably without having seen the types.

The specimen is in an extremely bad state of preservation and much faded, but sufficient remains to identify it without much hesitation with the five skinks collected by Messrs. Chasen and Fendlebury. As stated by Bartlett they are quite distinct from *variegatum*. The following description is drawn up from the six specimens.

Distance between the end of the snout and the fore-limb once and a half times in distance between the axilla and groin. Snout obtusely pointed; lower eye-lid scaly; ear opening without lobules, nearly as large as the eye-opening.

Rostral convex, in good contact with the fronto-nasal which is considerably broader than long; no supranasals; nostril in the nasal; prefrontals in contact with one another or separated by a small shield; frontal shorter than the frontoparietal and interparietal together; six or seven supraoculars, the first three in contact with the frontal; parietals in suture behind the interparietal; no nuchals; two superposed anterior loreals; seven supralabials, the fifth below the middle of the eye.

Thirty-four to 38 smooth scales round the middle of the body, laterals a little smaller than the dorsals or ventrals.

Limbs well developed; the hind-limb reaches the fingers or the wrist of the adpressed fore-limb; 15 to 17 lamellae beneath the fourth toe.

Dark brown above, the back with small yellow spots which are more crowded along the sides; upper half of flank black with numerous yellow spots; limbs brown above spotted with yellow; labials with black sutures; whitish below, the throat uniform or spotted with black.

Length of head and body 51; tail 67 mm.

Most nearly related to *L. variegatum* from which it differs in the fewer scales round the body, fewer digital lamellae, shorter limbs and colour pattern. Possibly a high altitude derivative of *L. variegatum*.

## SNAKES

*Sibynophis geminatus*

Two specimens from Kiau.

The largest, a female, has a total length of 900 mm., tail 365. This is much longer than any previously recorded, but there is a specimen in the British Museum collection, also from Kina Balu, which is almost as long.

*Natrix murudensis*

*Natrix murudensis* M. A. Smith, J. Sarawak Mus., III, 1925, p. 5.

Originally described from two specimens obtained on Mt. Murud at 5,500—6,000 feet altitude. Messrs. Chasen and Pendlebury obtained three more, two at Kamborangah (one at an altitude of 8,000 feet) and one at Kiatu. The following details will supplement my original remarks, and an excellent coloured sketch of the snake by Mr. Chasen enables me to describe the colours of the living creature.

Internasals as long as or a little shorter than the prefrontals; frontal longer than broad, as long as its distance from the end of the snout; anterior sublinguals shorter than the posterior.\*

Olive brown above with a more or less distinct dorsal series of black spots or short cross-bars and a dorso-lateral series of small yellow spots on the middle and hinder part of the body and tail. Neck vermilion above with black spots arranged quincuncially; lips vermilion. Belly pale greyish, with a longitudinal series of small black spots best marked towards the outer margins of the ventrals.

The ventral and subcaudal counts of the five examples now known stands as follows:—

- ♂, V. 178; c. 96. Kina Balu.  
 ♂, V. 179; c. 95.        "  
 ♀, V. 187; c. 89.        "  
 ♀, V. 176; c. 83. Mt. Murud.  
 ♀, V. 179; ?            "

*Oreocalamus hanitschi*

*Oreocalamus hanitschi*, Boulenger, Ann. Mag. Nat. Hist., (7) IV, 1899, p. 452; Hanitsch, J. Straits Br. Roy. Asiat. Soc., 1900, p. 72 and pl. I, fig. 3; de Rooij, Sn. Indo-Austral. Archipel., 1917, p. 141, fig.

A single male specimen from Marei Parei.

The type and only previously known specimen, also a male, was obtained by Dr. R. Hanitsch on Kina Balu at 4,200 feet altitude. It is now considerably bleached, but in other characters the second example agrees well with it. As the original description is probably not readily accessible to all and as De Rooij's description contains a bad clerical error, I have drawn up a new one based on the two specimens.

\*The original description stating the reverse is a slip.

Maxillary teeth 11, subequal. Snout pointed; rostral as broad as high, the portion visible above being about as long as the internasals which are half the length of the prefrontals; frontal longer than broad, longer than its distance from the end of the snout, shorter than the parietals; nostril close to the rostral, between a small nasal and the first labial; loreal longer than high, its lower border forming an angle, wedged in between the second and third labials; one pre- and one postocular; temporals 1+2; eight supra-labials, fourth and fifth touching the eye, the seventh the largest; four lower labials in contact with the anterior sublinguals which are longer than the posterior. Scales quite smooth, in 17-17-17 rows; ventrals 127-132; anal entire; subcaudals 26-28 pairs.

Blackish above and on the outer ends of the ventral shields; yellowish below, uniform or with a few scattered brown dots; tail with a dark median streak.

Total length 570; tail 80 mm.

*Calamaria vermiformis*

Kiau 2 ♀♀, ventrals 168, 171; subcaudals 17, 18; 1 ♂, v. 160; c. 23. Lumu Lumu, 1 ♂, v. 179; c. 16.

The two females (adults) are uniform brown above, the outer two scale-rows being dirty whitish. The ventrals are white with black transverse bars, occupying usually two scales, and sometimes incomplete. The male from Kiau, a juvenile, is very dark brown above with narrow transverse bars formed of small white spots; the head is light brown, paler at the sides. Below it is coloured like the females. This colour pattern is a juvenile one only, the white dorsal bars disappearing and the head becoming darker, with age.

The adult specimens represent the most common colour form and the most widely distributed one. A rarer colour form is one in which the dark ventral bars increase in size and may occupy the whole of the ventral surface. More rarely still the bars are entirely absent.

The specimen from Lumu Lumu (adult) is black above, the lateral margins of each scale being white (yellow in life) thus forming series of white longitudinal lines; the belly is uniform white. This colour pattern, but with the dark ventral bars added is represented in the British Museum collection by five specimens from Fort de Kock, West coast of Sumatra.

*Calamaria pendleburyi*, sp. nov.

Description of the type. Adult female.

Diameter of the eye one and a half times as great as its distance from the mouth; rostral broader than high; frontal one and a half times as long as broad, not twice as broad as the supraocular.

shorter than the parietals; one pre- and one postocular; five upper labials, third and fourth touching the eye, fifth much the longest, twice as long as the fourth; mental in contact with the anterior sublinguals which are in contact with the first three infralabials; posterior sublinguals in contact with one another. Scales in 13 rows. Ventrals 146; anal single; subcaudals 19 pairs.

Dark brown above, the colour extending to the outer margins of the ventral shields, but interrupted by a white line through the middle of the outermost row of scales; white below. Upper lip white; tail with a dark median line.

Three specimens examined, all from Kiau.

In one, a male, the eye is equal to its distance from the mouth. The scale counts are as follows:—

♀	ventrals 147;	subcaudals 19.	Type.
♀	„ 146;	„ 17.	Paratype.
♂	„ 133;	„ 20.	„

*C. pendleburyi* is closely allied to *C. stahlknechti* from Nias and Sumatra and *C. indragirica* also from Sumatra. It differs from both in the longer mental shield, the longer fifth labial, fewer ventral shields and in colour pattern. Dr. Roux has kindly compared one of my specimens with the type of *indragirica* and there are topotypes from Nias of *stahlknechti* in the British Museum of Natural History for comparison.

[I take this opportunity to point out that *Calamaria baluensis* Boulenger and *C. moultoni* Dunn are in my opinion identical with *C. grabowskyi* Fischer. I have compared the types and only known specimens of the two first named, both in the British Museum collection, with paratypes of *C. grabowskyi*, also in the same collection, and with the exception of slight differences in the proportions of the rostral and frontal shields I can find no character to separate them.

In colour pattern the three forms are identical. I count the ventral shields of *C. moultoni* to be 168. Dunn evidently made them 172, and 122 as given in his description is a typographical error.]

#### *Naja naja miolapis*

Three specimens from Kiau. Scales in 21 or 23 rows on the neck, 17 at mid-body.

#### *Maticora intestinalis*

Four examples from Kiau. All belong to the colour form *nigrotæniatus*.

#### *Trimeresurus chaseni*, sp. nov.

Plate II, fig. 1.

Two specimens from Kiau, one adult and one half grown.

Description of the type. Adult male. Snout moderate; eye very small, its distance from the mouth twice its own diameter; rostral a little broader than high; upper head scales large, subimbricate, obtusely keeled, four or five in a transverse series between the supraoculars which are very large; snout bordered above by five large scales, namely, three internasals, and one on either side between them and the eye; six supralabials, second below but not bordering the loreal pit, third highest and separated from the eye by two rows of small scales. Ten and eleven infralabials; a single pair of elongated sublinguals.

Scales in 19.19.15 rows, the median rows strongly keeled anteriorly, feebly keeled posteriorly. Ventrals 143; anal entire; subcaudals 20 pairs. Tail not prehensile.

Brownish above with irregular blackish, light edged blotches which posteriorly become transverse bands. Yellowish below heavily powdered with grey; an oblique black stripe behind the eye bordered below with white.

Total length 645 mm.; tail 45 mm.

The paratype does not differ in any important particular from the type. Being immature its markings are more clearly defined. Ventrals 130; subcaudals 20 pairs, tail not quite complete. It is a female.

*Trimeresurus chaseni* is most closely related to *T. monticola*, from which it differs in the number of scale-rows, the fewer infralabials and several other smaller characters. *T. monticola* has been recorded from Sumatra (Boulenger, Fauna Malay Pen., 1912, p. 216) but I am unable to find the authority on which this statement is based. Otherwise it is known only from continental Asia.

#### *Trimeresurus sumatranus*

One male example from Lumu Lumu. It differs from the recognized description in having only 19 scale-rows and slightly fewer ventrals, but in other respects resembles typical *sumatranus*.

Six interoculars, eight and nine supralabials; scale-rows 19-19-13; ventrals 173; subcaudals 64. Total length 1,220; tail 195 mm.

Green above, the top of the head and fore-part of the body heavily marked with black, this colour becoming scarcer posteriorly and forming indistinct transverse bands. Scales on sides of head, ventrals and subcaudals heavily margined with black. Upper surface of tail red.

*Trimeresurus gramineus*

Kiau, 6 exs., Kenokok, 1 ex.

All have 21 scale-rows at mid-body.

## PART III.

List of the species known to inhabit Mt. Kina Balu above 3,000 feet.

\*Those marked with an asterisk have not been recorded before from the mountain.

## AMPHIBIANS

\**Megophrys monticola* Kuhl and v. Hass." *nasuta* (Schlegel)." *hasseltii* (Tschudi).\* " *gracilis* (Günther)." *baluensis* (Boulenger).\**Leptobranchella baluensis* M. A. Smith.*Nectophryne misera* Mocquard." *everetti* Boulenger." *maculata* Mocquard.\* " *altitudinis* M. A. Smith.*Bufo leptopus* Günther." *spinulifer* Mocquard." *asper* Gravenhorst." *biporcatus* Gravenhorst.\**Kalophrynus pleurostigma* Tschudi.\**Chaperina fusca* Mocquard.*Phrynoglossus baluensis* (Boulenger).\**Rana macrodon* Dum. and Bib." *kuhli* Dum. and Bib." *palawanensis* Boulenger." *luctuosa* (Peters).\* " *jerboa* (Günther)." *whiteheadi* Boulenger." *cavitympanum* Boulenger." *everetti* Boulenger.\* " *chalconota* (Schlegel).\* " *nicobariensis* (Stoliczka)." *tuberilinguis* Boulenger." *guttatus* (Günther).*Cornufer baluensis* Boulenger.*Simomantis latopalmatus* (Boulenger).*Rhacophorus leucomystax* (Gravenhorst)." *macroscelis* Boulenger." *acutirostris* Mocquard.\* " *pardalis* Günther.\**Philautus pictus* (Peters)." *petersi* (Boulenger).\* " *amoenus* M. A. Smith.\* " *spiculatus* M. A. Smith.\* " *mjobergi* M. A. Smith.

## LIZARDS

*Gymnodactylus marmoratus* (Kuhl)." *baluensis* Mocquard.\**Hemidactylus frenatus* Dum. and Bib." *garnoti* Dum. and Bib.*Peropus mutilatus* Wiegmann.\**Hemphyllodactylus typus* Bleeker.\**Gekko monarchus* Dum. and Bib.*Ptychozoon rhacophorus* (Boulenger).*Draco cornutus* Günther.\* " *fimbriatus* Kuhl." *maximus* Boulenger.\* " *quinquefasciatus* Gray.\* " *formosus* Boulenger." *obscurus* Boulenger.\**Gonocephalus borneensis* (Schlegel).*Japalura ornata* Lidth." *nigrilabris* (Peters).*Calotes cristatellus* (Kuhl).*Mabuya multicarinata* (Gray)." *multifasciata* (Kuhl).*Lygosoma tenuiculum* Mocquard." *variegatum* Peters.\* " *kinabaluensis* Bartlett.\* " *nieuwenhuisi* Lidth." *olivaceum* (Gray)." *bowringii* (Günther).*Tropidophorus beccarii* (Peters).

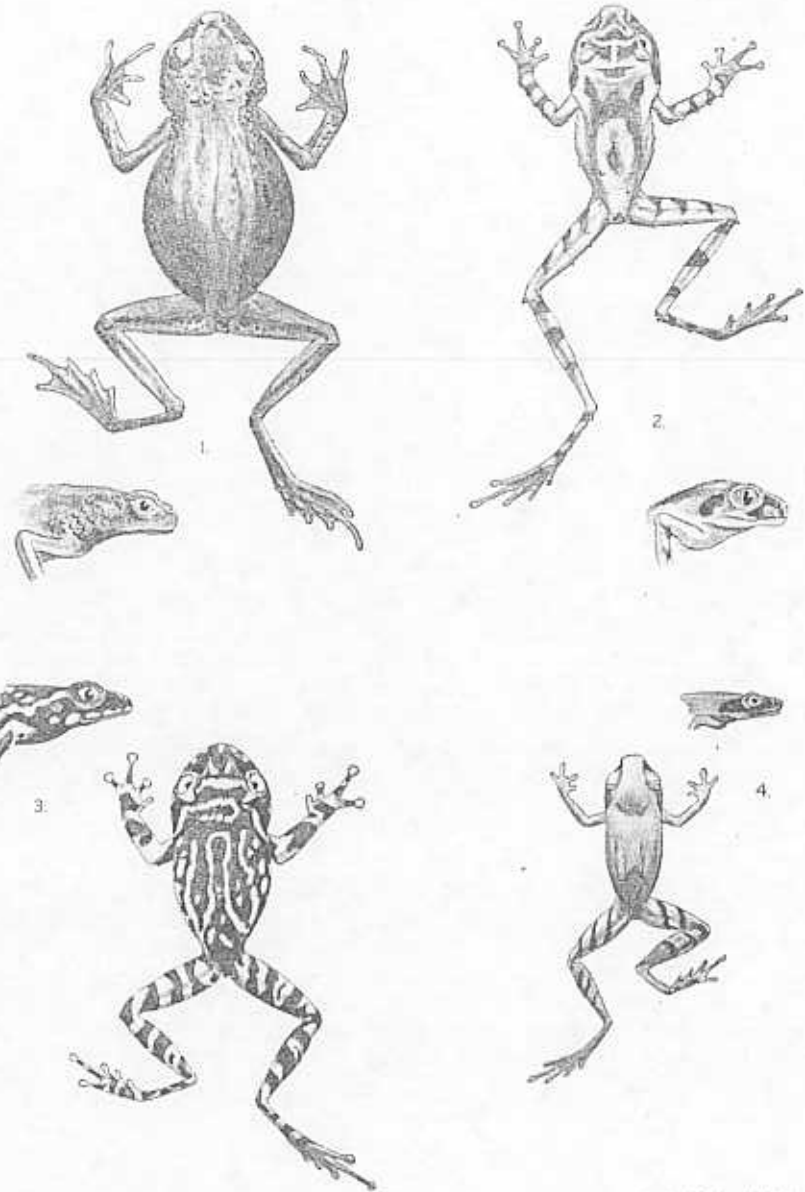
MALCOLM A. SMITH

SNAKES

- Stoliczkaia borneensis* Boulenger.  
*Opisthotropis typica* (Mocquard).  
*Sibynophis geminatus* (Boie).  
 \**Zaocys fuscus* (Günther).  
*Natrix trianguligerus* (Boie).  
 „ *saravacensis* (Günther).  
 „ *flacifrons* (Boulenger).  
 „ *chrysarga* (Schlegel).  
 „ *maculatus* (Edeling).  
 \* „ *murudensis* M. A. Smith.  
 \**Elaphe erythrura* (Schlegel).  
*Lycodon albofuscus* (Dum. and Bib.).  
*Oligodon purpurascens* (Schlegel).  
 „ *octolineatus* (Schneider).  
 „ *everetti* (Boulenger).  
 „ *vertebralis* (Günther).  
*Hydrablabes praefrontalis* (Mocquard).  
*Gongylosoma baliodeirum* (Boie).  
*Gongylosoma baliodeira* (Boie).  
*Oreocalamus hanitschi* (Boulenger).  
*Calamaria vermiformis* Dum. and Bib.  
 „ *grabowskyi* Fisher.  
 „ *leucogaster* Bleeker.  
 „ *bicolor* Dum. and Bib.  
 \* „ *pendleburyi* M. A. Smith.  
 „ *brachyura* Boulenger.  
 „ *lateralis* Mocquard.  
*Psammodynastes pulverulentus* (Boie).  
 \**Passerita prasina* Boie.  
*Bungarus flaviceps* Reinhardt.  
*Naja naja miolapis* Boulenger.  
*Maticora intestinalis* (Laurenti).  
*Amblycephalus laevis* Boie.  
 \**Trimeresurus sumatranus* (Raffles).  
 \* „ *chasei* M. A. Smith.  
 \* „ *gramineus* (Shaw).

EXPLANATION OF PLATES

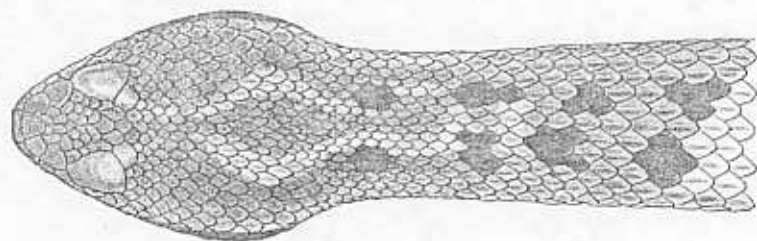
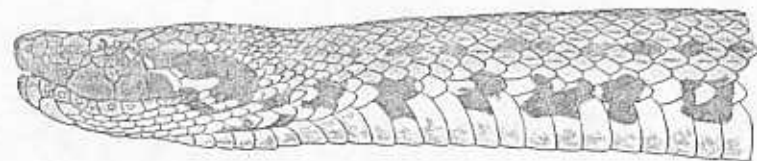
- Pl. I, fig. 1. *Nectophryne altitudinis* M. A. Smith.  
 „ „ 2. *Philautus spiculosus* M. A. Smith.  
 „ „ 3. *Philautus amoenus* M. A. Smith.  
 „ „ 4. *Leptobranchella baluensis* M. A. Smith.  
 Pl. II, fig. 1. *Trimeresurus chasei* M. A. Smith.  
 „ „ 2. *Jalapura ornata* Lidth de Jeude.



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1. *Nectophryne altitudinis* M. A. Smith.  
 2. *Philautus spiculosus* M. A. Smith.  
 3. *Philautus amoenus* M. A. Smith.  
 4. *Leptobranchella baluensis* M. A. Smith.



W.P.C. Deane del.

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1. *Trimeresurus chasenii* M. A. Smith.
2. *Jalapura ornata* Lidith de Jeude.