
2.c.
2.
3.d
3.c.
3.a.

described from these islands, there appeared several doubtful points to be settled. I was, therefore, most anxious to obtain as large a material as was possible, and on two different occasions despatched my collector to those islands. With the very kind assistance of Capt. J. Avern, of the Steamer "Scotia," Capt. Rundell, Assistant Superintendent of the Nicobars, Th. Ad. de Röepstorff, and Mr. Homfray, at the Andamans, I have not only procured nearly all the species which had been already recorded as occurring on these islands, and several others previously known from India, Burma, Penang and Java, but also a few as yet undescribed forms. It was to be expected that the Amphibien and and Reptilien fauna of the Andamans and Nicobars will shew a great similarity to each other; several species of lizards and snakes are common to both, and the whole fauna greatly resembles the Malayan, gradually passing into the Burmese fauna, both being in a great many points very closely related to each other. The detailed lists of species known to occur on the islands will exhibit this more clearly. They will not only shew the distribution of some of our common Burmese and Indian species, but at the same time indicate the peculiarity of each of the small geographical provinces alluded to.

The number of Amphibia as yet known is very small, and there cannot be the least doubt that many more species of frogs will yet be discovered on both the Andamans and Nicobars; tree-frogs especially ought to be numerous in the damp jungles of the Andaman and South Nicobar islands. Of Lacertilia there are several peculiar species, and the genera mostly agree with Malayan forms, such as *Tiaris*, *Ptychozoon*, *Cyrtodactylus*, *Phelsuma*, *Peripia*, *Bronchocele*, and others; a few more are of Indian and Burmese type. Among the Ophidia, the genera are more generally distributed all over India, such as *Python*, *Dendrophys*, *Gonyosoma*, *Compsosoma*, *Tropidonotus*, *Ptyas*, *Ablabes*, &c. Most of the species from the islands belonging to these genera are also found in Burma, in the Malayan peninsula, and the neighbouring Philippine islands. One of the most marked features in the Reptilian fauna of the Nicobars and Andamans consists in* the great number of *Trimeresurus*; particularly at the Nicobars, where the jungle appears to swarm

* *Hydrophidæ*, or the poisonous water-snakes, appear to be comparatively rare, they prefer sandy shores to those surrounded by coral reefs.

with them. Those I obtained from the latter islands only belong to two distinct species, *T. Cantori*, Blyth, and *T. mutabilis*, n. sp., but the number of specimens, particularly of the former species, is very great. An idea of this may be formed from the fact that my collector procured, within a comparatively short time, some 60 specimens of the former and about 30 of the latter species. Fortunately these vipers do not seem to be as dangerous as their allies usually are. I shall speak of their poisonous properties further on, when noticing the various species of the genus *Trimeresurus*.

T. Cantori is also common at the Andamans, but *T. mutabilis* seems to be there much rarer. Beside these two, a third species is to be met with at the Andamans; it was called *T. porphyraceus* by Blyth, and also does not appear to be common. It seems to be sufficiently distinct from either *T. carinatus* and *purpureus*, with which it has been considered as identical by different herpetologists.

The following species* have up to the present been observed from the Andamans.

AMPHIBIA.

1. *Rana gracilis*, Wiegm., var. *Andamanensis*.
2. *Bufo melanosticus*, Schneid.

REPTILIA.

3. *Hydrosaurus salvator*, Laur.
4. *Gecko stentor*, Cant.
5. „ *verus*, Merr.
6. *Phelsuma Andamanense*, Blyth.
7. *Peripia Cantori*, Günth.
8. *Hemidactylus frenatus*, Schleg.
9. „ *maculatus*, D. and Bib.
10. *Cyrtodactylus rubidus*, (*Puellula rubida*, Blyth).

* I will mark those species which have been recorded as occurring on the islands, but of which I have not seen specimens, with an asterisk (*). I may as well notice that the only species which have been described from these islands are those by Blyth, (see Appendix in Mouat's Adventures and Researches among the Andaman islanders, &c., 1863, p. 364), by Theobald in his Cat. of Burmese Reptiles, and some others by Steindachner, published in the scientific results of the "Voyage of the Austrian Frigatte Novara," Amphibia and Reptilia, 1865.

11. *Tiliqua carinata*, Schneid.
12. *Hinulia maculata*, Blyth.
13. *Tiaris subcristata*, Blyth, (= *Coryphylax Maximiliani*, Fitz. apud Steindachner).
14. *Ptyas mucosus*, L.
15. *Gonyosoma oxycephalum*, Boie.
16. *Compsosoma melanurum*, Schleg.
17. *Tropidonotus quincunctiatus*, Schleg. (=*T. Tytleri*, Blyth, and *T. striolatus*, Blyth apud Theobald.)
18. *Dipsas hexagonotus*, Blyth.
19. *Dendrophis picta*, Gm.
20. *Lycodon aulicus*, L. (=*Tytleria hypsirhinoides*, Theobald.)
21. *Cerberus rhynchops*, Schneid.
22. *Ophiophagus elaps*, Schleg.
23. *Naja tripudians*, Merr.
24. *Trimeresurus porphyraceus*, Blyth.
25. ,, *Cantori*, Blyth.
26. ,, *mutabilis*, n. sp.
27.* *Caouana olivacea*, Esch.
28. *Chelonia virgata*, Schweig.
29. *Caretta squamata*, Bont.

From the Nicobars the following are on record—

Amphibia.

1. *Rana gracilis*, Wiegm., var. *Nicobariensis*.
2. *Hylorana Nicobariensis*, n. sp.
3. *Bufo melanosticus*, Schneid., var., (=*Bufo spinipes*, Fitz. =*B. gymnauchen*, Bleek.)

Reptilia.

4.* *Crocodilus* sp.

There is no doubt of the occurrence of a Crocodile on the Nicobars. Capt. Rundell informed me that he obtained a small live specimen of one, but it unfortunately did not reach me in time before the steamer left; it is most likely *C. porosus*, Schneid.

5.* *Hydrosaurus salvator*, Laur., (recorded by Blyth).

6. *Ptychozoon homalocephalum*, Kuhl.

7. *Hemidactylus frenatus*, Schleg.

8.* *Tiliqua carinata*, Schneid, (recorded by Steindachner).

9. ,, *olivacea*, Gray.

10. ,, *rugifera*, n. sp.

11.* *Euprepes* (*Lygosoma*) *macrotis*, Fitz. (recorded by Steindachner).

12.* *Typhloscincus Nicobaricus*, Fitz. (recorded by Steindachner).

13.* *Calotes mystaceus*, Daud. (recorded by Blyth.)

14. ,, *ophiomachus*, Merr.

15.* *Bronchocele cristatella*, Kuhl, (recorded by Steindachner.)

16. ,, *jubata*, D. and Bib.

17. *Tiaris subcristata*, Blyth.

18. *Ablabes Nicobariensis*, n. sp.

19. *Dendrophis picta*, Gmel.

20. *Lycodon aulicus*, L.

21. *Python reticulatus*, Schneid.

22. *Pelamis platurus*, L. (= *bicolor*, Schneid.)

23.* *Platurus laticaudatus*, L. (recorded by Steindachner.)

24.* ,, *Fischeri*, Jan, (,, ,, ,,)

25. *Trimeresurus mutabilis*, n. sp.

26. ,, *Cantori*, Blyth, (= ?? *Trim. labialis*, Fitz. apud Steindachner, see further on)

27.* ,, *purpureus*, Gray. This species is also recorded by Steindachner, but as he says that the specimens are in bad state of preservation, they may prove to be unicoloured varieties of *T. mutabilis*, though *purpureus* may also occur, but I have not as yet seen any specimens from the Nicobars.

28-29. Blyth mentions fragments of *Chel. virgata* and *imbricata*, and very likely some more of the Pelagic species will be found. I have myself seen fragments of turtle bones and of their shells with the natives, but I would not venture to identify the species.

Accidentally the number of species upon record from both groups of islands is the same, but the Nicobar fauna appears to be richer, especially in the Scincidæ and Agamidæ, and no doubt may more snakes will also be found. There were several species obtained by

the Austrian expedition, which we have not yet received in Calcutta from these islands. The almost total want of COLUBRIDÆ on the Nicobars is remarkable.

From Penang I have to add to the Amphibia a form which appears to be a third interesting variety of the very variable *Rana gracilis*, and two new species, *Polypedates Hascheanus* and *Ansonia Penangensis* (n. gen. et sp.). Among the *Ophidia* I procured a new *Trimeresurus*,—*T. convictus*,—rather closely allied to the Himalayan *T. monticola*, Günth., and a very interesting species of *Mabouya*,—*M. Jerdoniana* —which I got on the little Pulo Tickus, close to the northern shore of Prince of Wales island.

I have also added a complete description of the rare *Gecko Smithii*, Gray, a specimen of which was sent to me from Java, and that of what appears to be a full grown specimen of *Tetragonosoma effrene*, Cant., from the island Banca.

From Amherst, near Moulmein, I have recorded a new species of the rare genus *Cantoria*, and from Martaban a very interesting small *Riopa*. At the last locality, I also obtained Jerdon's *Diplopelma Carnaticum*, *Caloula pulchra*, Gray, *Hylorana Tytleri*, Theob., *Hinulia maculata*, Blyth, and some others.

The following is a complete list of the species noted in the present paper; the families are quoted, according to Dr. Günther's work on "Indian Reptiles."

AMPHIBIA.

BATRACHIA.

1. Rana gracilis, Wiegm., typical.
   ,, ,, ,, var. Andamanensis.
   ,, ,, ,, ,, Nicobariensis.
   ,, ,, ,, ,, pulla, (from Penang hill.)
2. Rana cyanophlictis, Schneid.
3. Pyxicephalus breviceps, Schneid.
4. Polypedates Hascheanus, n. sp.
5. ,, maculatus, Gray.
6. Hylorana Tytleri, Theob. (? = *erythræa*, Schleg).
7. ,, Nicobariensis, n. sp.
8. Ansonia Penangensis, n. gen. et sp.
9. Diplopelma Carnaticum, Jerd.

10. Caloula pulchra, Gray.
11. Bufo viridis, Laur.
12. ,, melanosticus, Schneid. (= gymnauchen, Bleek., = spinipes, Fitz.

REPTILIA.

Lacertilia.

13. Phychozoon homalocephalun, Kuhl.
14. Gecko guttatus, Daud.
15. ,, stentor, Cantor.
16. ,, Smithii, Gray.
17. Phelsuma Andamanense, Blyth.
18. Peripia Peronii, Cantor.
19. ,, Cantoris, Günth.
20. Hemidaclylus frenatus, Schleg.
21. ,, maculatus, D. & B.
22. Cyrtodactylus rubidus, (*Puellula rubida*, Blyth).
23. ,, affinis, n. sp.
24. Tiliqua carinata, Schneid., (Eup. rufescens, Schaw. apud Günther.)
25. ,, rugifera, n. sp.
26. ,, olivacea, Gray.
27. Mabouya Jerdoniana, n. sp.
28. Hinulia maculata, Blyth.
29. Riopa lineolata, n. sp.
30. Calotes mystaceus, D. & B.
31. Bronchocele cristatella, Kuhl.
32. ,, Moluccana, Less.
33. ,, jubata, D. & B.
34. Tiairis subcristata, Blyth.
35. Draco volans, Linn.

Ophidia.

36. Cylindrophis rufus, Laur.
37. Ablabes melanocephalus, Gray.
38. ,, Rappii, Günth.
39. ,, collaris, Gray.
40. ,, Nicobariensis, n. sp.

41. Ptyas mucosus, L.
42. „ hexahonotus, Cant., (*Xenelaphis idem* apud Günther).
43. Compsosoma radiatum, Reinv.
44. „ melanurum, Schleg.
45. „ semifasciata, Blyth, (*Platyceps idem*).
46. „ Hodgsoni, Günth.
47. Tropidonotus quincuntiatus, Schleg. (*T. Tytleri* and *striolatus*, Blyth).
48. „ stolatus, L.
49. „ platyceps, Blyth, (*Zamenis Himalayanus*, Steind.).
50. Gonyosoma oxycephalum, Boie.
51. Dendrophis picta, Gmel.
52. „ caudolineata, Gray.
53. Chrysopelea ornata, Shaw.
54. „ rubescens, Gray.
55. Psammophis condanurus, Merr. (*Phayrea isabellina*, Theob.)
56. Tragops fronticinctus, Günth.
57. Dipsas hexagonotus, Blyth.
58. „ multifasciata, Blyth.
59. Lycodon striatus, Shaw.
60. „ aulicus, L. (*Tytleria* of Theobald).
61. Tetragonosoma effrene, Cant. (var.).
62. Python molurus, L.
63. „ reticulatus, Schneid.
64. Hypsirhina plumbea, Boie.
65. Cerberus rhynchops, Schneid.
66. Hipistes hydrinus, Cant.
67. Cantoria Dayana, n. sp.
68. Bangurus cœruleus, Schneid.
69. Ophiophagus elaps, Schleg.
70. Naja tripudians, Merr.
71. Callophis intestinalis, Laur.
72. Enhydrina Valakadyn, Boie, (= *E. Bengalensis*).
73. „ shistosa, Daud.
74. Pelamys bicolor, Schneid.
75. Trimeresurus gramineus, Shaw.

76. Trimeresurus erythrurus, Cant.
77. ,, carinatus, Gray.
78. ,, porphyraceus, Blyth.
79. ,, mutabilis, n. sp.
80. ,, Cantoris, Blyth.
81. ,, convictus, n. sp.
82. Halys Hymalayanus, Günth.
83. Daboia Russelii, Shaw.

CHELONIA.

84. Emys crassicollis, Bell.

AMPHIBIA.

BATRACHIA.

Fam. RANIDÆ.

1. *Rana gracilis*, Wiegm. (Günth. l. cit. p. 409.)

This species is very common in the Sundarbans, all along the coast of Arracan, near Rangoon, Moulmein, Tenasserim, the Welesley Province, Penang, and apparently also at the Andamans and Nicobars; it usually does not hesitate to take to sea or brackish water, and is, as a rule, a true litoral species.

In specimens from all these localities the coloration is typical, the spots on the back,* the band between the eyes, and the spots on the lips are never absent, there is, however, no rule as to the presence or absence of the pale dorsal streak; generally it is present and occasionally (on some specimens from Rangoon and Penang), almost as wide as the interspace between the eyes. The body of the largest specimen, I have collected at Akyab (Arracan coast), measured about 2½ inches in length; this specimen has four ruddy spots on the back between the shoulders, forming a cross. Specimens with the body 2 inches long are comparatively very common. The external surface of the vocal region is black in the male. The length of the snout slightly varies, but it is usually conspicuously attenuated, apparently more so in the males than in the females. In specimens with a narrower snout, the ridges of the vomerine teeth almost touch each

* In young specimens there is only one transverse somewhat undulating dark band above the middle of the body; the skin is generally distinctly tubercular.

other, in those with somewhat broader snout, the interspace between the dental ridges is more or less widened. As regards the proportions of the length of the legs compared with those of the body, the Arracan and Rangoon specimens are the most true to the type; the legs being stout and the distance from the anus to the metatarsal tubercle equal to, or very little longer than, the length of the body; the toes are half webbed, but in young specimens the webbing appears a little stronger, because the toes are thin and of moderate length, while in old ones, the fourth toe especially is much elongated, and more so in the males than in the females.

In several specimens from the neighbourhood of Moulmein and some others, obtained near the coast at Penang, the distance between the anus and the metatarsal tubercle is conspicuously* more than the length of the body, the difference amounting to about $\frac{1}{8}$th of the length of the body, the specimens are also a little more slenderly built, but no other specific difference exists, except that in some specimens, the toes are conspicuously slender and elongated, so as to make the webbing appear to be still less than in Arracan specimens.

a. As variety **Andamanensis** may be distinguished, the form occurring on the Andamans. I have examined four specimens from Port Blair. Of the smallest the body is about one-third of an inch long, of the two next above one inch, and of the fourth 2$\frac{1}{3}$rd inches. In all the specimens the snout appears a little shorter and more obtuse than in typical *gracilis*, and the hind feet are decidedly more slender, and proportionately longer than in that form. In the first specimen the difference is equal to $\frac{1}{7}$th of the length of the body, in the two of middle size it is $\frac{1}{5}$th in one and a little less than $\frac{1}{5}$th in the other, in the large specimen it is very nearly $\frac{1}{6}$th; one of the specimens has a thin vertebral streak, the others none; the chin and breast are spotted with black, mostly conspicuous in those of median size.

The rest of the characters and the coloration remains true to the type, except perhaps the webbing of the toes, appearing to

* In one specimen, noted in the list of measurements as *e*, the feet are proportionately very long, but they are not slender to the same extent, as they are in the Andaman variety.

be a little stronger than in most other specimens; the web reaches to the tip of the third, but not to that of the fifth toe; the fringe on the external edge of the fifth toe is almost obsolete. The tubercles which are in young specimens very distinct on the body, and above the eyes, become also nearly quite obsolete in the old frog.

Although at the first sight the greater length of the legs and the obtuse snout appear to be striking differences, I don't think that they are sufficient to regard this insular form as distinct from the continental, particularly so, when we observe the changes in the length of the legs of the Arracan and Rangoon specimens, and those from the Welesley province. Possibly the above noted differences may in time become better developed, and may then be considered as of specific value: that is — a *local race* may in time *become a species.*

b. var. **Nicobariensis.** From the Nicobars, in the neighbourhhood of the Nancowri harbour, I obtained one peculiar young specimen. The body measures 1¼th inch, and the distance between the vent and metatarsal tubercle is slightly more than that of the length of the body, thus in this point coming up very near to the typical Arracan specimens, but it has the short snout of the *var. Andamanensis*, and of the next variety from Penang. It differs, however, from both in the very slight webbing of the feet, the toes being considerably elongated and slender, the fourth equals in length to very nearly half the body, the disks are slightly swollen, and the web is almost only basal, it hardly extends to half the length of the toes; the cutaneous fringe on the edge of the fifth toe is slight but distinct, and the tubercle at the base of the fourth toe obsolete. The skin is, like in other young specimens of *gracilis*, finely tuberculated, and the whole habitus and coloration identical with type specimens; the lower side is finely mottled with dusky, as in *Andamanensis.*

c. var. **pulla.** As a further variety of *R. gracilis* I regard two specimens which I obtained in a small pool of water at a height of about 2,000 feet on the Penang hill. One is only $\frac{6}{8}$th, and the other $\frac{7}{8}$th of an inch long; they agree with the Andaman variety in the somewhat obtuse form of the snout, spotted chin and breast and the

slenderness of the feet; in the first the difference of the distance between the anus and the metatarsal tubercle, and that of the body is $\frac{1}{8}$th more of the length of the latter, in the second specimen it is nearly one-sixth; but in both specimens the toes are proportionately shorter and more fully webbed; the fifth toe has the cutaneous fringe as distinct as in typical *gracilis*. The colour of the fresh specimens was a light brown with green spots, perfectly identical in distribution with those of *gracilis*, with which also the tubercles on the back entirely agree; these two specimens have no dorsal streak.

When viewed independently from other specimens, nothing would be easier than to regard the above noted Penang small variety as a distinct species, for, in addition to the obtuse form of the snout, and the greater length of the legs noticed in the Andaman variety, we have in this a complete webbing of the toes. However, there is in any case, at present no sufficient reason for doing this. For I have already noticed that in young specimens of typical *gracilis* the toes appear stronger webbed than in old ones, and as the two specimens from the Penang hill are evidently young ones, they may shew this development accidentally more, than perhaps other specimens in the same locality would do. Until this has been sufficiently ascertained, the other more constant characters consisting in the form of the body, and also the very characteristic coloration must be regarded as more important than the peculiarity of a known variable character.

In all these varieties quoted above the constancy in coloration is most marked. I do not regard the more or less pointed or obtuse snout as a character of great importance, for it varies considerably in specimens of one and the same locality in different stages of age, and apparently also in the sexes. Neither would the reference to the greater or lesser length of the hind limbs appear to be very important, but that the webbing of the toes should vary so considerably as noted above, is really very remarkable; and I would certainly have separated the Andaman and the small Penang form as distinct species—on account of shorter snout, longer limbs and stronger webbing of the toes,—had I not obtained from the Nicobars, situated geographically between both, a form which has the short snout of the two last varieties, but the proportionately short

limbs of the type form ; on the other hand, however, a very slight webbing, distinct from all others !

I hope to be able to give illustrations of all these forms, as soon as I may be placed in possession of more extended materials which, I trust, will be sufficient either to confirm the present determination, or to shew that what I pointed out as varieties are in reality to be considered as distinct species. I can now only repeat that, whatever anxiety some herpetologists may feel regarding the consistency of the species in question, I cannot view those insular forms, on comparing them with hundreds of specimens which I myself collected in the Sundarbans, Arracan, Rangoon and down the Tanasserim coast to Penang, as anything else but local varieties of one and the same species. I shall now only add the actual measurements of the principal forms.

Measurement in inches.	Typical form, Arracan, toes half webbed.		Moulmein, toes half webbed.		Penang, the low land form, toes $\frac{2}{3}$th webbed.		var. *Andamanensis*, toes $\frac{4}{5}$th webbed.		var. *Nicobariensis* toes $\frac{1}{3}$th webbed.	var. *pulla*, toes fully webbed.
	a	b	c	d	e	f	g	h	i	k
Length of body, ...	$1\frac{6}{16}$	$2\frac{9}{16}$	$1\frac{7}{16}$	$2\frac{3}{16}$	2	$1\frac{11}{16}$	$1\frac{2}{16}$	$2\frac{6}{16}$	$1\frac{5}{16}$	$\frac{14}{16}$
Distance from vent to metatarsal tubercle, ...	$1\frac{7}{16}$	$\frac{10}{16}$	$1\frac{8}{16}$	$2\frac{7}{16}$	$2\frac{8}{16}$	$1\frac{14}{16}$	$1\frac{5}{16}$	$2\frac{11}{16}$	$1\frac{7}{16}$	$1\frac{1}{16}$
Length of fourth toe, ...	$\frac{23}{2}$	$1\frac{2}{16}$	$\frac{23}{32}$	$1\frac{1}{16}$	very nearly $1\frac{2}{16}$	$\frac{14}{16}$	$\frac{9}{16}$	$1\frac{2}{16}$	$\frac{11}{16}$	nearly $\frac{7}{16}$
Total length of hind limb, ...	$2\frac{5}{32}$	$3\frac{12}{16}$	$2\frac{7}{32}$	$3\frac{8}{16}$	$3\frac{10}{16}$	$3\frac{21}{16}$	$1\frac{14}{16}$	$3\frac{13}{16}$	$2\frac{2}{16}$	$1\frac{8}{16}$

The varieties from Moulmein and (i) *Nicobariensis* are almost identical in measurements.

2. *Rana cyanophlyctis*, Schneid. (Günth. l. cit. p. 406).

This species has been collected by Dr. F. Day in Orissa where it appears to be common. Specimens measuring up to 3 inches in

length of the body are also not rare in the Sundarbans, and the species here principally lives in pools of water which is more or less brackish.

3. *Pyxicephalus breviceps*, Schneid. (Günth. l. cit. p. 411).

A specimen was obtained by my collectors in the forests above Kotegurh at about 7000 feet; body measured $2\frac{1}{4}''$, the hind leg $2\frac{3}{5}''$.

Fam. Polypedatidæ.

4. **Polypedates Hascheanus,** n. sp. Pl IX, Fig. 3.

Body moderately slender, anteriorly rather wider than posteriorly and depressed; skin smooth or with few indistinct small tubercles except above the eyes; snout moderate, obtuse, slightly longer than the distance between the eyes; fore foot, when laid forward, exceeds the snout nearly by the whole length of the first finger; the distance between anus and heel is slightly less than the length of the body; tympanum round, smaller than the eye; the dorsal glandular fold is rather indistinct on the forepart of the body, but clearly traceable on the posterior half of it, a second glandular fold runs from the hind edge of the orbit above the tympanum to the upper arm; toes slightly webbed in young specimens, but in the largest specimen observed they are about one-third webbed; only the terminal disks of toes are conspicuously flattened and enlarged; the inner metatarsal tubercle is large and compressed the outer at the base of the fourth toe almost obsolete; vomerine ridges very small and distant, but present even in the smallest specimens less than half an inch long.

Colour above lighter or darker olive brown with few irregular small spots, (sometimes, though rarely pale, almost yellowish olive); with a black band between the eyes, edged with light in front, followed by a W mark, the ends of which begin almost behind the eyes, a pair of somewhat indistinct blackish spots below the middle of the body; sides of the front part of the body black, lips slightly spotted with white, a large white spot behind the angle of the mouth, sides of body mottled and punctated with white and black limbs with dark brown cross bands; lower parts whitish olive mottled and finely punctated with dusky, especially on the sides about the fore and on the hind limbs.

I found this species tolerably common all through the higher forests (about 1000 feet above sea level) in the island of Penang; it does not seem to grow to a large size, for though I have seen hundreds of specimens in different places of the island, the largest I obtained, only measures $\frac{15}{16}''$ in length of body, the distance from anus to heel, is $\frac{14}{16}''$ inches, the fourth toe $\frac{7}{16}''$ and the total of hind limb $1\frac{9}{16}$ inch. The usual size of the specimens is only $\frac{9}{16}$, and nearly $\frac{9}{16}$, $\frac{4}{16}$, $\frac{15}{16}$ inches in the other corresponding measurements. It is generally seen on the leaves of small bushes or on the ground between old leaves; it is very active and on account of its very small size rather difficult to secure.

I have great pleasure in naming this species after my friend Alfred Hasche who has very kindly assisted me in my researches on the island.

5. *Polypedates maculatus*, Gray, (Günth. l. cit. p. 428.)

A variety of this species is not uncommon in Penang. Live specimens were of a yellowish brown colour with greenish tinge, the head much darker than the rest and with a distinct bluish tinge, the whole of the upper surface very minutely punctated with dark speaks; a short blackish partially interrupted streak below the timpanoid fold; all four feet with indistinct cross-bands, the hinder side of the femora blackish, spotted with white: the extreme edge of the upper lip white; below uniform yellowish white. The skin in young specimens is very finely granular above, in old ones it becomes smoother, especially on the posterior half of the body.

6. *Hylorana Tytleri*, Theob. Pl. IX, Fig. 1.

Cat. Rept. Asiat. Soc., Museum, p. 84.

(an idem *Hylorana erythræa*, Schleg. Günth. l. cit. p. 425.)

I have collected near Moulmein two specimens which I was first inclined to regard as a variety of *H. erythræa*. There is no essential difference in the measurements of the two.

	a. full grown.	*b.* young.
Length of body, ...	2 inch.	$\frac{10}{16}$ inch.
Distance from vent to heel, ...	$1\frac{12}{16}$,,	nearly $\frac{9}{16}$,,
Length of fourth toe, ...	$\frac{15}{16}$,,	$\frac{4}{16}$,,
Total length of hind leg, ...	$3\frac{5}{16}$,,	$\frac{15}{16}$,,

The snout is somewhat narrow in the more fully grown specimen. The fourth toe is rather short, the web reaching to the tip of the third and fifth toe. The first toe has at its base a very prominent laterally compressed tubercle, and another considerably smaller tubercle is at the base of the fourth toe, the last is not mentioned by Günther or Dum. and Bibron in the description of *erythræa*. The upper glandular fold is as usually distinct, the lower begins above the base of the upper lip, is interrupted above the humerus, then bends downwards as a short fold and disappears without continuing along the side of the body. From the upper hinder edge of the tympanum also a short thickened fold runs to the humeral tubercle. This character also occurs on two other specimens of unknown habitat in the Asiatic Society's Museum, but in the one named *Tytleri* by Theobald, there seem to be, besides the short curved glandular ridge, slight traces of its lateral extension, it being broken up until it disappears on the posterior middle part of the belly. In this last specimen the toes are also fully webbed, and the fourth toe is little more than half the length of the body, as in typical *erythræa*. The lower portions of the femora are distinctly granular.

The Moulmein young specimen is dark brownish green above, black on the sides, the old one olive green above, blackish on the anterior half of the sides, and mottled with black on the posterior; the glandular folds are white, the upper lips with a white streak, but their edges are blackish; the lower parts are pale mottled with black on the anterior half; the hinder parts of the femora are also mottled or marbled with black, but the upper sides of both fore and hind limbs are brown banded. This last coloration is also never mentioned in the published descriptions of *erythræa*, though Schlegel's figure apparently seems to indicate it on the tarsal portion of the hind limbs.

It would seem, without a comparison of typical specimens of *erythræa*, rather difficult to state whether our Lower Bengal and Burmese specimens have to be specifically separated from *erythræa*, or not, but with all the apparent very great similarity they really seem to me to be distinct. In Theobald's type specimen* of

* This is the Dacca specimen to which Blyth alludes when he says of *Hylorana* (*Lymnodytes*) *macularia* (Journal, Asiatic Society, Bengal, XXIII,

H. Tytleri the measurements almost perfectly agree with those of *erythræa*, the body is by nearly half the length of the snout longer than the distance between vent and heel, and the fourth toe is slightly more than half the length of the body. There are, however, two distinct metatarsal tubercles of which the one on the first toe is very prominent and large, and the legs are banded brown above. If these last characters never occur in *erythræa* of the southern regions, the specific name *Tytleri* will have to be reserved for our form. The indistinct continuation of the lower glandular fold on the body cannot be taken into consideration, neither the somewhat elongated form of the fourth toe, for there can be no doubt that the two above mentioned specimens from Moulmein, and two others in the Museum, (either also from Lower Bengal or from Burma), are identical with Theobald's *Tytleri*, and in all these, the lower glandular fold bends down behind the fore limb and then disappears; the fourth toe also is slightly shorter than half the length of the body; in other characters all the specimens entirely agree.

Hylorana Nicobariensis, n. sp. Pl. IX, Fig. 2.

In its slender habit resembling the last, but the snout is narrower and more obtusely rounded than in that species, its end very little projecting above the lower jaw; canthus rostralis rounded; loreal region slightly excavated; tympanum round, almost circular and little smaller than the eye; skin in the males above, finely granular, more distinctly so posteriorly, lower side of the femora coarsely granular; in the females the skin is smoother; a distinct gland runs from behind the eye on each side of the upper edge of the back; a second gland is indicated by two tubercles, one behind the angle of the mouth and the second posterior to it above the humerus, and in some specimens there is even a third much smaller tubercle present from which a short rim bends downwards; all these glands, however, are much less distinct in very young specimens.

p. 299), that it differs from *erythræa* "by its shorter and stouter limbs and short anterior digits, &c." Günther's somewhat sarcastic remark (l. cit. p. 425) on that point is uncalled for, because Blyth's type of *macularia* is actually $2\frac{3}{8}$ in total length, and the distance from vent to heel only two, consequently less than that of the body, and the limbs are thus actually stouter and shorter than in the specimen described by Günther, though both no doubt are the same species.

The disks of the fingers and toes are well developed, on the latter the web reaches fully up to the tip of the third and fifth toes. The second and fourth fingers are sub-equal, and the third is about one-third longer than the fourth. Two metatarsal tubercles are present, the marginal one at the base of the first toe is elongated and laterally strongly compressed, the other which is smaller and rounded is placed at the base of the fourth toe. The length of the body (measured in 8 full grown and 5 young specimens), is somewhat more than the distance between the anus and heel, and the fourth toe is shorter than half the length of the body. The following are the actual measurements of two of the largest specimens:

	♂	♀
Length of body, ...	2 inch.	$1\frac{14}{16}$ inch.
Distance from vent to heel, ...	$1\frac{12}{16}$,,	$1\frac{12}{16}$,,
Length of fourth toe, ...	$\frac{15}{16}$,,	$\frac{15}{16}$,,
Total length of hind limb, ...	$3\frac{4}{16}$,,	$3\frac{3}{16}$,,

In comparing these measurements with those given of the Moulmein *H. Tytleri*, the two will be found to be almost identical. And this first led me to believe that the present species may only be a variety of *Tytleri* (*? erythræa*), but the larger tympanum of *Nicobariensis*, the usual total want of the short downward bent lower glandular fold, the better developed disks of the fingers and toes, the greater length of the third finger, then the presence of two almost sub-equal tubercles at the base of the toes, a distinctly larger gape of the mouth, somewhat more distant ridges of vomerine teeth, &c., &c., are so well marked in all the specimens examined that, on comparing them with the corresponding characters of *Tytleri*, the conclusion seems fully justified that the Nicobar form indicates a sufficiently distinct specific type.

Colour above olive greenish, much darker and almost black in some male specimens, upper glandular fold pale, upper lip whitish, lower glandular tubercles usually purely white; sides of body including the loreal region black, which uniform colour, however, fades on the posterior part of the body and is sometimes replaced there by a few dark spots. Lower parts more or less mottled with black, sometimes almost wholly black in the males, but yellowish between the

thighs; in the females, the lower parts are whitish, either uniform or only slightly dusky. Fore limbs with few indistinct cross bands, a dark streak in front of the upper arm, and another one behind, as well as on the lower arm; hind limbs above banded with brown, behind indistinctly mottled with dark and yellow.

In coloration and in the development of the disks of the fingers and toes, &c., this species much resembles *H. temporalis*, Günth., (l. cit. p. 425) from Ceylon. But in this species the hind limbs appear to be in proportion longer, the snout is much broader, the third finger shorter, and it is said to have "no glands behind the angle of the mouth." In *Tytleri* the lower glandular tubercle commences between the tympanum and the upper angle of the mouth; in *Nicobariensis* that tubercle is situated behind and rather almost below the angle of the mouth.

Fam. Rhinodermatidæ apud Günther.

No maxilary or vomerine teeth; ear and tympanum developed; toes webbed; sacral vertebra dilated; no paratoids.

Ansonia, n. gen.

Body slender, elongated, rather depressed, uniform in width; sacral vertebra much dilated; muzzle short, obtuse; limbs long and slender; fingers four long, smooth, free and peculiarly cylindrical; toes five, not much developed, half webbed; disks of fingers and toes slightly swollen, rounded.

The great peculiarity of this genus rests in the slender form of the body and the great length and slenderness of the limbs, and especially of the fingers. In the general character it more reminds of *Phryniscus*, than any of the genera of the Rhinodermatidæ, referred to this family by Günther, but it is readily distinguished from the former genus by the tympanum and open eustachian tubes. I have associated with this new form, the name of my esteemed friend, Col. Anson, the present Governor of Penang, who has shewn the greatest interest in my natural history researches during my short stay on the island.

8. **Ansonia Penangensis**, n. sp. Pl. IX, Fig. 4.

Body slender and long, almost with parallel sides throughout; muzzle short and blunt in front, shorter than the interspace between

the eyes; the whole of the upper and lower skin, except on chin and throat, tuberculated; tympanum distinct, smaller than the eye; tongue elongated, elliptical, rather thick, entire; fore limb as long as the distance between the hinder edge of eye to the posterior end of body, distance from anus to heel nearly as long as the body; hand on the inner side with a large ball; first finger shortest, then comes second, then fourth, and the third is longest, all are cylindrical and with slightly dilated and smaller disks at the end; toes half webbed, rather short; metatarsal tubercles indistinct, a large flat one at the base of the first toe and a small slightly more prominent one at the base of the fifth toe; in young specimens they are not developed. Above uniform ashy, marbled and reticulated with black; sides of head and body, and the limbs with rather large pale orange or yellowish warts or spots, lower parts dusky with small white spots, especially on the sides of the belly and in front of the shoulders; lower part of belly and the inner thighs of a beautiful rose colour in life specimens. The measurements of two specimens of different sizes are as follows:

	a.	*b.*	
Length of body, ...	$\frac{8}{16}$	$\frac{14}{16}$	inches.
Length of fore limb, ...(nearly)	$\frac{7}{16}$	$\frac{11}{16}$	,,
Distance from anus to heel, ..(nearly)	$\frac{8}{16}$	$\frac{12}{16}$	,,
Length of fourth toe, ...	$\frac{3}{16}$	$\frac{5}{16}$	,,
Total length of hind limb, ...	$\frac{13}{16}$	$1\frac{5}{16}$	,,

I have only obtained four specimens of this interesting species on Penang, two near the great water-fall (above the Alexandra bath), and two in a narrow gorge about half way up the Penang hill. In both cases, the specimens were found flatly attached to the side of the rock above the water, and did not make the slightest attempt to escape when taken from it. This habitat seems peculiar, and corresponds with that of a new species which Dr. Jerdon lately received from South India through Major Beddome (vide Proc. Asiat. Soc. for March, 1870, p. 85). In general form and style of colouring our species much reminds of *Ixalus opistorhodus*, lately described by Dr. Günther from a Nilgheri specimen (Proc. Zool. Soc., 1868, p. 484, pl. 37, fig. 3.)

9. *Diplopelma carnaticum*, J e r d., Pl. IX, Fig. 5.

Engystoma carnaticum, J e r d o n, Journ. Asiat. Soc., Beng. 1853, XXII, p. 534.

Body moderately stout with proportionate limbs; snout short, obtuse, its length being equal, or hardly equal, to the width of the head between the eyes; a front limb when laid forward exceeds the snout by half the length of the third finger; length of body equal to, or very little less, than the distance between the anus and the metatarsal tubercle; length of fourth toe equal to, or less than, half the length of the body; skin on the posterior part of the femora extended as in *Caloula;* fingers and toes with small rounded disks; two metatarsal tubercles, the one at the base of the first toe is elongated and compressed, the other at the base of the fifth toe either a little larger, or scarcely smaller and rounded; toes only webbed at the base, their length variable.

Color above isabella or yellowish brown, with a dark bottle-shaped mark along the back beginning between the eyes with a tris-cusped edge, after which it contracts, then again widens, and a little below the middle of the body divides in two pairs of branches, of which the posterior extends to the base of the femora; a triangular black mark about the anus, extending below; on each side of the median brown mark are undulating longitudinal dusky streaks, these lateral portion of the back are sometimes, during life, tinged with rose colour, similar to *Caloula pulchra;* limbs with brown cross bars, sides dark, purplish black, this color disappearing posteriorly, an oblique pale streak extending from the eye towards the shoulder; below dull whitish, mottled with dusky, especially on chin and throat.

This is, as Dr. J e r d o n (Proc. Asiat. Soc., March, 1870, p. 85) remarks, a wide spread species. I am indebted to him for the identification of my specimens, their colouring being almost perfectly identical with his original drawing from which the scanty notice of *Æng. carnaticum*, published nearly 20 years ago in the Society's Journal, was taken. It was originally described from the Carnatic; numerous specimens exist from Beerbhoom in the Asiat. Soc. Col.; Dr. J e r d o n obtained it in the Khasi hills, and I found

three specimens under a large block of wood at Martaban (near Moulmein) in company with one small *Caloula pulchra* and young specimens of *Bufo melanosticus*.

The measurements of my specimens are as follows:—

	a.	*b.*	*c.*	
Length of body, ...	$\frac{12}{16}$	1	1	inch.
Distance from anus to metatarsal tubercle, ...	$\frac{14}{16}$	1	$1\frac{2}{16}$	,,
Length of fourth toe, ...	$\frac{13}{32}$	$\frac{15}{32}$	$\frac{8}{16}$	,,

Specimen *c* has a pale median dorsal streak extending the whole length of the body, the two others have none.

10. *Caloula pulchra*, Gray, (Günth., l. cit. p. 437).

In spite of the dilated disks of the toes and fingers, this remarkable Batrachian is by no means arboreal in its habit. I twice observed it near Moulmein. It appeared after sunset about the same time as *Bufo melanosticus*, crawling on old wood and feeding on white ants.

In external character both *Caloula* and *Diplopelma* are very closely allied, and young specimens of the former, in which the vomerine ridge is not developed, can strictly speaking hardly be distinguished from the latter, except by the slightly more dilated disks of the toes. I am even not quite certain whether the distinctions between the two are really such as to entitle them to generic rank, which doubt especially becomes apparent, when we compare the descriptions of the two other Burmese species of *Diplopelma* described by Blyth; in any case when kept distinct they should be classed close together in one family.

Fam. Bufonidæ.

11. *Bufo viridis*, Laur. (Günth., Cat. Bat. Brit. Mus. p. 58).

Steindachner (Nov. Exped., Amph. p. 40) already recorded this species as occurring in Spiti. It is found throughout the Sutlej valley from Kotegurh upwards, but is always rare. At Kotegurh, between 6 and 9000 feet, it is occasionally met within localities where *B. melanosticus* also occurs, but further to east in Kunavar,

the latter is not found, and in Spiti only *B. viridis* is met with, usually between 11 and 13,000 feet, though far from common. At the village Gieumal, I found a small specimen at about 15,000 feet, which is probably the highest locality from which a Batrachian was ever recorded.

12. *Bufo melanosticus*, Schneid, (Günth., l. cit. p. 422). (Syn. *Bufo isos*, D. and B. = ? *B. gymauchen*, Bleek., = *B. spinipes*, Fitz.).

Younger specimens of this species are, as a rule, much more slender than old ones, and the same applies to the form of the paratoids; they are dark ashy (rarely light brown) variegated with black. There are, however, very many variations to be observed in both the length of the body and of the paratoids. The width of the head also greatly varies. The species is said not to possess a rim on the inner edge of the tarsus, some specimens have it, however, distinctly indicated, either as a short continuous fold, or as a row of somewhat enlarged tubercles; this can be seen in specimens from about Calcutta, and I observed the same also in some of the younger and half grown ones from near Moulmein, Penang, Malacca, Singapore, the Andamans and Nicobars. Himalayan specimens from the Sutlej valley, and some of the specimens from the interior of the Andamans, and one or two from Moulmein, hardly possess a trace of it, but all these are of large size, having the tarsus particularly thickened and rounded.

Steindachner (Amphibia der Novara Exped. p. 42,) justly, I think, questions the specific difference of *Bufo isos*, D. and B., (or ? *B. gymnauchen*, Bleek.), from *B. melanosticus*, stating that in the latter, considerable variations exist as to the more or less complete webbing of the toes. I also find that it is impossible to attribute to this character within certain limits much specific value. The pure land forms, such as those from the Himalayas, from Upper Bengal, from the interior of the hills east of Moulmein and from the jungles of the Andamans, usually have the toes more elongated, and consequently they appear to be only moderately webbed. The webbing extends on the fourth toe to about half its length, and is further on only indicated by a minute ridge on either

side. In many specimens from Lower Bengal, particularly in some from the Sundarbans, in some from Moulmein, Penang, Malacca, Singapore, the Nicobars and in others from the Andamans,—that is, in such forms which are always found near the water,—the webbing appears stronger, principally on account of the toes not being so much elongated, or the webbing is in reality more developed; but the transition from one form into the other is so gradual, that no specific distinction can be attached to it.

Considering these differences in the webbing of the toes and the usual indication of a tarsal fold in authentic *melanosticus*, I can hardly see the reason for which Steindachner retained Fitzinger's *Bufo spinipes* from the Nicobars as a distinct species, (l. cit. p. 43). I have compared several specimens from Nancowry and Camorta, and cannot detect any specific distinction from *melanosticus*. The more slender form is only a character of young and middle age, though it is sometimes retained by specimens attaining a length of five inches. I have seen such specimens in abundance near Moulmein, on the sea coast at Malacca and the Welesley province.

The webbing in the Nicobar form is moderate, such as in some Andaman specimens, and the young from both islands are always rather dark ashy, much marbled with black, and the body is greatly elongated. My largest specimen from the Nicobars is $2\frac{1}{2}$ inches, and one paratoid gland is somewhat less than one-third the length of the body, which is as a rule also the case in specimens of *melanosticus* from other localities; in Malacca specimens only it is sometimes nearly one-fourth; these have also an equally slender and long body as those from the Nicobars. Günther considers *spinipes* (Records 1867, p. 146) as identical with *gymnauchen* which he apparently acknowledges to be distinct from *melanosticus*, (see also Proc. Zol. Soc., 1868, p. 479).

The largest specimen of *melanosticus* I saw, is from near Moulmein, measuring $6\frac{1}{2}$ inches in the length of the body.

[To be continued in the next number.]

EXPLANATION OF PL. IX.

Fig. 1. *Hylorana Tytleri*, T h e o b., 1, side view, the toes of the right hind limb shewn internally; 1 a. upper view of the head; 1 b, interior of the mouth, shewing the tongue and the vomerine teeth, &c., from Moulmein.

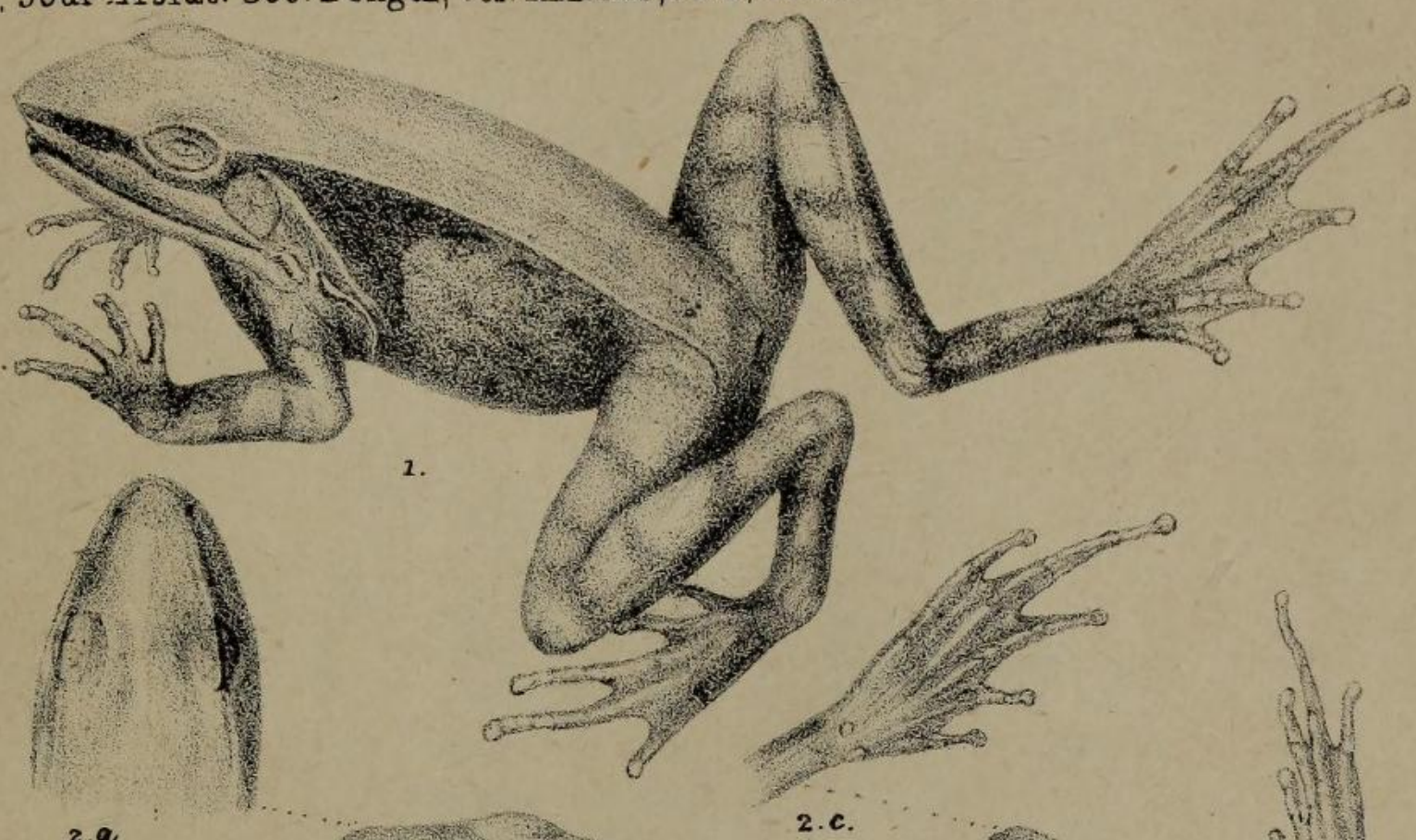
Fig. 2. *Hylorana Nicobariensis*, n. sp.; 2, side view; 2 a, head from above; 2 b, interior of the mouth; from the Nicobars.

Fig. 3. *Polypadates Hascheanus*, n. sp.; 3, view from above, 3 a, anterior half of the body from the side; 3 c, interior of the fore- 3 d, interior of the hind limb; the two last figures enlarged; from Penang.

Fig. 4. *Ansonia Penangensis*, n. sp.; 4, 4 a, dorsal and ventral views, 4 b, side view of the head; 4 c, front part with the mouth opened, shewing the form of the tongue; 4 d, sacral vertebra with the coccygial style; 4 e, interior of the toes of one hind limb, 4 f, interior of the left hand, the two last figures enlarged; from Penang.

Fig. 5. *Diplopelma Carnaticum*, J e r d., upper view, from Martaban, near Moulmein.


1.a.

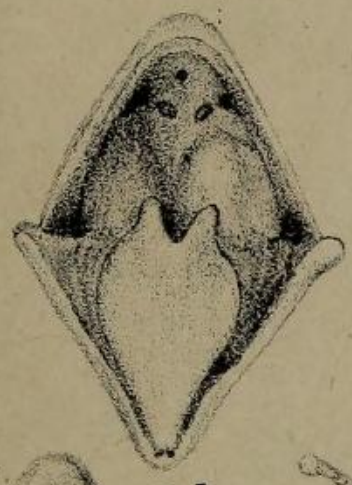

1.


1.b.

2.a

2.c.


3.b.


2.b.


2.


3.


3.d


3.c.


3.a.


4.e.


4.f.


5.


4.c


4.b.


4.


4.d


4.a.

1. *Hylorana Tytleri, Theob.*
2. " *Nicobariensis, n. sp.*
3. *Polypedates Hascheanus, n. sp.*
4. *Ansonia Penangensis, n. g. et sp.*
5. *Diplopelma Carnaticum, Jerdon.*

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PART II.—PHYSICAL SCIENCE.

No. III.—1870.

OBSERVATIONS ON SOME INDIAN AND MALAYAN AMPHIBIA AND REPTILIA,—*by Dr.* F. STOLICZKA.

(*Concluded from p.* 157.)

REPTILIA.

LACERTILIA.

Fam. GECKOTIDÆ.

13. *Ptychozoon homalocephalum*, Crev.-*var.*-(Günth. l. cit. p. 105).

This species has already been noticed by Steindachner from the Nicobars; it is rare in Tenasserim, and has also been obtained in Pegu by Major Berdmore. In Penang* it is not uncommon. I only got one specimen at the Nancowry harbour on Camorta, near the new settlement; it possesses some peculiarities.—The total length is 6½ inches, the body being half an inch longer than the tail. It is pale purplish brown, all over mottled and marbled with darker brown, partially with indistinct cross bands; the flaps are purplish fleshy, with

* Since writing these notes, I received a large collection of Amphibia and Reptilia from Penang and the Malayan country east of it, and I hope to be able to publish additional information about many species in a subsequent number of our Journal. [F. STOL.]

bluish, rather fine marblings. The shields on the flaps are considerably transversely elongated, rectangular. There is no flap in front of the femur, but it is continuous behind; and the thumb and nail on the first toe are rather small and semicircular. Above, there is only one row of enlarged tubercles, beginning quite laterally about the middle of the belly and continuing on the tail; this is segmented, the segments being indicated by cross series of two pairs of enlarged sub-conical tubercles; 13 upper, 10 lower labials, the lower rostral is small, the first lower labials on each side being conspicuously larger; the median pair of chin-shields is considerably elongated and forms a suture, all the chin-shields along the labials are slightly enlarged decreasing in size posteriorly; scales of belly small in about 20 longitudinal series, they are hexagonal; 19 enlarged preanal scales in an angular series, only about the 12 median ones are partially pierced, the adjoining scales below the angle are conspicuously enlarged, but the scales on the preanal edge itself are very small; most of the median sub-caudals are considerably enlarged and in two rows, but are by no means regularly placed.

14. *Gecko guttatus*, Daud, (Günth., l. cit. p. 102).

This is a well known Burmese inhabitant. It is very common in the houses about Rangoon, Moulmein, Amherst &c., and is also occasionally met with about Calcutta. Specimens taken in Dacca, and particularly those from the Khasi hills, are sometimes of different coloration, and the larger tubercles on the back vary in size, and number. In some specimens also, I have not counted more than 12 pre-anal pores, while in others the number rises to 32. Still more variable are specimens from the Arracan coast, and they constitute, as well as the Khasi variety, a local race. Good series of these Geckos are necessary for comparison. I am not certain whether the Arracan form does not exclusively belong to the next species, for unfortunately I have not kept many specimens.

15. *Gecko stentor*, Cant. (Günth., l. cit. p. 102).

Gecko Verreauxi, Tytler, Jour. Asiat. Soc, Beng. xxxiii, p. 546.

This rare Gecko occurs, as noticed by Theobald (Catal. Rept. Asiat. Soc. Mus., p. 29), also at the Andamans, and specimens of 14 inches of which the tail measures 6 or 6½ inches are by no means

uncommon. It lives on trees; its general colour is ashy or pale brownish (without the green tinge of *G. guttatus*), with some dark brown markings on the posterior part of the head, the sides of the neck; the hind feet, partially, and the tail are encircled with darker brownish bands separated by pale whitish ones. This is often a sign of immaturity in other allied forms. The scales or shields on the head are very much smaller and more flattened than in *G. guttatus*, and the same applies to the shields of the chin. On the back, the middle 4 series of enlarged tubercles alternate and are comparatively small; they are separated by a rather broad interspace from the adjoining rows of considerably enlarged tubercles; of these there are usually 4 rows on each side (rarely only 3), and particularly some of the innermost rows are enlarged, black or dark brown with white tips. On the tail, the two median rows of enlarged tubercles disappear in about half the length, the other four tubercles which are sharply pointed and conical, continue on to the end.

I have also observed specimens of this species near Akyab (Arracan), and lately I saw a young specimen which was caught at Chittagong. Thus we may look out for *Gecko stentor* also in Southern and Eastern Bengal.

16. *Gecko Smithii*, Gray, (Günther, l. cit. p. 103).

The following is a description taken from an apparently nearly full grown specimen which I have received from Java.

Above, blackish brown, lighter on the head, the front part of which has a greenish grey tinge, occiput with two V form rows of white spots, the first being accompanied in front by a blackish edge; body with six transverse rows of white spots (the third imperfect, not reaching on to the left side), the sixth consists of only 3 distinct spots situated between the femora; base of tail marked with one central and one lateral spot on each side, not extending below, then follow 7 distant white rings, the last being the smallest, occupying the tip of the tail; feet spotted white.

Below, chin whitish, breast and belly pale marbled with grey, a number of dark spots are more distinct at the sides than along the centre; feet marbled like the belly; tail dark, especially towards the end. in addition to the white rings seen above, there is between

each of the 1st and 2nd, the 2nd and 3rd and the 3rd and 4th one large white spot.

The head is rather long in proportion to the body, covered with small flattened sub-equal granules, slightly varying in size on the posterior part of the body and especially at the sides; there are 12 longitudinal rows round the body; one row of superciliary shields is slightly enlarged, rostral shield large, followed by a pair of supra-rostrals, 16 upper-,12 lower labials; opening of the ear oviform almost vertical, broader below than above; pre-anal pores 15; total length 5.8 inches, of which the tail is 2·4 inch; head 0·8 inch, femur 0·4 inch, total length of one hind limb 1·1 inch.

I have not met with this species at Penang though it may occur there; the only known specimen in the Fort Pit Museum is said to have been obtained at Penang.

17. *Phelsuma Andamanense*, B l y t h (G ü n t h., l. cit. p. 112).

Gecko chameleon, T y t l e r, Journ. A. S. B., 1864, xxxiii, p. 548.

This is, as Mr. B l y t h notes, in form and coloration a close ally to the Mauritius *Ph. Cepedianum*, differing from it by a longer snout; there are only a few larger shields next to the lower anterior labials, but hardly as large as in *Cepedianum*.

The type specimen has no femoral pores, and is evidently a female, but a row of slightly enlarged shields indicates their place. In male specimens an angular row of 28—30 femoral pores is present exactly as in the Mauritius species. In *Ph. Andamanense*, the subcaudals are enlarged; there are eleven upper labials, the two last being very small, and 9-10 lower labials.

The general style of coloration of both species is much the same, but the short mesial streak, beginning at the nape, appears characteristic of the Andaman form. When alive, the ground colour changes considerably from bright emerald green and a bluish tinge to almost dark brown bluish, with yellow, orange and reddish spots the lower parts are generally more or less bright yellowish.

The usual size is five inches, of which the tail measures nearly one-half, but it grows up to six inches; it is found also in houses, though usually only on trees which were no doubt its natural

habitat before any houses on the Andamans were constructed. I did not find the species to be common about Port Blair.

18. *Peripia Peronii*, D. and B. (G ü n t h., l. cit. p. 110).
19. ——— *Cantoris*, G ü n t h., (ibidem).

The former is the most common house Gecko all over the island of Penang, along the sea coast as well as on the top of the Penang hill, at an elevation of 2,500 feet.

The young lizard is brown, with numerous rather large round pale spots all over the body, and each labial has a pale spot. Full grown specimens are pale ashy, sometimes almost white, all over densely and very minutely punctated with brown; some indistinct round pale spots are usually traceable on the posterior part of the head and about the shoulders; there are as a rule no brown spots on the labials, which are minutely punctated like the rest of the body, though the ground colour is paler.

In one specimen, captured on the Penang hill, the tail became injured. It grew afterwards particularly thick, short, with a separate short appendage above and another below on the side, no enlarged shields were formed below, in which character this specimen would agree with *P. Cantoris*, but it has the two pairs of enlarged chin shields followed by a few smaller shields on either side, peculiar to *P. Peronii*.

The former species, characterized by G ü n t h e r, I never met with on Penang, it must be extremely rare. But it is found at the Andamans, as noted by T h e o b a l d (Cat. Rept. Asiat. Soc. Mus. p. 30), though also very rarely. Col. T y t l e r named it (characteristic of his particular desire of renaming species) *Gecko Harrieti*, (Journ. Asiat. Soc., Bengal, xxxiii, p. 548). A specimen presented by Col. T y t l e r to the Museum is 2·8 inches long, it has thirteen upper, and ten lower labials, but the last shields of both are very small; central scales in forty-two series; the tail is depressed, and with minute spines on the edges of the front half. The general colour above is a sort of fawn colour with reddish brown and yellowish undulating transverse bands, between the shoulders, loins and on the tail interrupted by irregular blackish brown spots; a brown band extends from the rostral through the eye to the shoulder, and is edged above with yellowish.

P. Peronii is also recorded by Mr. T h e o b a l d from Burma. The name *Gecko pardus* (Journ. A. S., B. xxxiii, 1864, p. 547) appears to have been applied to it by Col. T y t l e r.

The largest specimen of *P. Peronii* collected was six inches. In some specimens, I find the posterior plates on the toes are only angularly bent and not perfectly divided, what clearly indicates that the distinction between *Gecko* and *Peripia* is only of subordinate importance, and that the species included in the latter should strictly speakiug form only a section of the former.

20. *Hemidactylus frenatus*, S c h l e g. (G ü n t h., l. cit. p. 108)
Gecko chaus and *caracal*, T y t l e r, Journ. Asiat. Soc., Bengal, 1864, vol. xxxiii, p. 547.

This common Indian species also occurs in Penang; I only obtained it on two occasions, both times on the pillars of the verandah; it seems to have been expelled from the interior apartments by the much stronger *Peripia Peronii*.

It is also found in Burma, in the whole of Lower Bengal, at the Andamans, where it seems to attain a larger size, and at the Nicobars. The thumb and inner toe are always particularly small but with distinct claws; the middle portion of the back does not usually have any enlarged tubercles, but sometimes there are two alternating rows of them, the three rows on each side are, however, pretty constant. The tail when reproduced, usually becomes smooth, without enlarged spines. In an Andaman specimen, the subcaudal plates are very considerably enlarged. Specimens from Rangoon have a very conspicuous broad whitish band from the nostril continuing through the eye to above the ear; it is bordered below by black. The Nicobar specimens are small and have mostly only 36-38 series of scales on the belly; the thumb is almost obsolete, but there is no other specific difference. They were obtained on trees on Camorta, near the new settlement. The largest specimen I saw is from Moulmein, it measures 5½ inches with the tail 3 inches.

21. *Hemidactylus maculatus*, D. and B. (G ü n t h., l. cit. p. 107).
Gecko Tytleri, T y t l e r, Journ. Asiat. Soc. Bengal, xxxiii, p. 547.

This is very common about Moulmein. The number of upper labials varies between 11 and 13, the last 4 or 5 being as usually very

small; the lower labials vary from 8-10, and 9 is the most usual number, in the Tenasserim specimens at least. When the tail is reproduced, the spines don't grow again. The colour is sometimes uniform dark brown, sometimes pale with dark spots and broadish streaks, which usually have a tendency to arrange themselves in 5 longitudinal rows on the body. The blackish eye-streak is accompanied above and below by a light grey or pale yellowish band. In the brown varieties, the head above is generally spotted with pale. The usual size of Tenasserim specimens is 4 and 5 inches, of which the tail measures slightly more than one half.

I have also obtained specimens of this species near Port Blair (Mount Harriette) on the Andamans.

About Calcutta this Gecko is generally seen inside houses, while *H. Coctæi* is usually seen on the outer walls. There are, however, certainly two quite distinct forms which appear to have been regarded as *Coctæi:* The one is a small species rarely growing to a greater length than 6 inches, it has some enlarged tubercles on the back and the claw on the thumb is almost perfectly obsolete. The other species is much larger, but has no enlarged tubercles, and the claw on the tumb very distinct. I have seen specimens of this last measuring fully 10 inches, it is during life greenish with distinct transverse bands, lighter in front and dark posteriorly. I am now engaged in collecting all the *Geckotidæ* about Calcutta and hope to be able to trace the differences indicated more clearly. There are certainly 4, if not 5, distinct species of *Hemidactylus* alone in and on our houses; and perhaps some other genera will be found represented. They are extremely useful animals, for they destroy a very large number of obnoxious and molesting insects in the house, and should always be carefully protected against injury.

22. *Cyrtodactylus rubidus*, Blyth, sp.

Puellula rubida, Blyth, Journ. Asiat. Soc. Bengal, 1860, xxix, p. 109.
„ „ apud Günther, l. cit. p. 118.
„ „ Theobald, Cat. l. cit. et auctorum.
Gecko tigris, Tytler, Journ. Asiat. Soc., 1864, xxxiii, p. 546.

Body rather depressed, with numerous small and larger tubercles; head large in front, covered with equal, somewhat squarish

sub-granular shields: tail round with larger tubercles near the base and gradually disappearing towards the end which is curled; toes and fingers free, slender with a few sub-tubercular shields at their bases, and with narrow shields on more than the front half; claws short but sharply curved; ten upper and lower labials; the nostrils are superseded by a somewhat larger shield, and there are several small shields posterior to the rostral which is rather low and broad; four enlarged chin shields, the lower rostral reaches between the first pair; sub-caudals not enlarged. The preanal pores are situated in the male in a short fold between the femora, there are three or four on each side at the internal edge of the fold. In the females, this fold is either obsolete, or slightly indicated, but the pores are always absent.

Ground colour above light, or rarely darker, brown with a fleshy tinge about the head and with two generally distinct marks, one on the nape beginning from the eyes, the other across the shoulders; rest of head on the top spotted, with some dark streaks in front and on the sides; body dark spotted and striped; tail when perfect cylindrical with numerous broad blackish rings, somewhat confluent below; when reproduced it is thicker, shorter and of a more uniform brownish color with small blackish spots; below uniform whitish pale fleshy, or sometimes even purplish. The usual length of specimens is about five inches, but it grows up to six inches and perhaps more, the tail exceeding the body by about one-fifth of its length. The species seems peculiar to the Andamans; I found it on trees, but Col. T y t l e r mentions that it also occurs under stones where it no doubt searches after insects.

The above description of the species taken from fresh specimens collected by myself, shews that the character of Mr. B l y t h *Puellula* has to be cancelled, and that we have in the present lizard a typical *Cyrtodactylus*, as characterized by G r a y in his Catalogue of Lizards, p. 173. I am inclined to retain this genus as distinct from *Gymnodactylus*, which it otherwise closely resembles, but while the species of this last genus are house-Geckoes the *Cyrtodactyli* are typical tree-Geckoes, and their tail is rounded instead of flattened, the situation of the preanal or femoral pores is also very peculiar and distinct from *Gymnodactylus*.

Having carefully examined my fresh specimens, I was of course reluctant to see what it may be that has caused Mr. B l y t h to give such a different characteristic of his *Puellula*. On examining his originals the deception became clear. Evidently the specimens have been put in very strong spirit, or this had partially evaporated, and was refilled with perhaps double the strength. The skin of all specimens consequently shrunk along the back and on the sides, as well as between the femoral region, and these ridges had become so stiff and permanent, that it is by no means surprising they were taken as natural dorsal crest, and as folds on the side of the belly. However, a careful examination of these specimens shewed that the ridges are irregular, and in some places broken up so that there could be not the least doubt as to their being accidental. In fresh specimens nothing of all this exists, and the species is, as already noted, a typical *Cyrtodactylus*.

In external appearance and coloration, *C. rubidus* greatly resembles *Gymn. variegatus*, B l y t h, from Moulmein (G ü n t h., l. cit., p. 116), except that in this species the femoral pores are differently situated, the tubercles on the back and the scales on the belly are a little larger, the sub-caudals enlarged and the tail depressed, as in other *Gymnodactyli*.

I do not see Mr. T h e o b a l d's argument — Cat. Rept. Asiat. Soc. Museum, p. 32 — where he retains *G. variegatus*, under the genus *Naultinus* (vide G r a y ' s Lizards, p. 169), for it does not agree with that sub-genus in the form of the tail, nor in the position and distribution of the preanal pores.

23. **Cyrtodactylus affinis**, n. sp. Pl. X, fig. 1.

Body rather depressed, covered with smaller and numerous enlarged sub-trihedral tubercles, each of which has 3-5 grooves; shields of head small, those in front slightly enlarged and flattened; rostral very large, reaching posteriorly to the top of head and grooved, a small shield above each nostril but not in contact; upper labials 12, very low; opening of the ear moderate, vertically elongated; lower rostral very large, sub-triangular, reaching backward; eleven lower labials; a few of the chin shields next to the rostral are squarish, very litttle larger than others, but none

are elongated ; the scales of the belly are in about 30 longitudinal series, all are small, sub-tubercular and carinated ; no femoral or preanal pores, nor any enlarged scales indicating their presence the preanal region being regularly flattened ; tail round, with a few indistinct rings of enlarged tubercles near the base ; below on each side of the anus with 2 or 3 large polyhedral tubercles, further on, uniform scaly, tip curled ; no enlarged sub-caudals. The toes and fingers are very slender and elongated, and the claws very small, laterally compressed and sharp. The size of the fingers follows each other as 1, 2, 3, 5, 4, the 2nd and 3rd being sub-equal, and the 4th and 5th equally so, the thumb is a little more than half the size of the 4th finger. The toes follow each other as 1, 5, 2, 3, 4, the 1st is half the size of the 4th, the 2nd and 3rd sub-equal, and the 4th slightly longer.

General colour above pale vinaceous ashy, finely marbled and mottled with dark, especially on the head, sides of body and on the limbs. A V blackish mark on the nape, followed by a black spot on the neck, then follow five other angular blackish bands across the body, the first across the shoulders, the last between the hind limbs ; tail in front with four blackish broad bands gradually disappearing, and it then becomes almost uniformly ashy brown. The posterior portion has the appearance, as if it had been reproduced, but the anterior ¼th of its length is certainly original ; lower parts whitish with a slight purplish tinge.

The general form of the body with the elongated and slender toes and round tail, as well as the total absence of femoral pores or enlarged shields indicating them, and also the coloration so thoroughly agree with the females of *Cyrtodactylus rubidus*, that I prefer to describe the single specimen, as noted above, rather under this genus, than under *Gymnodactylus ;* for in *C. rubidus*, the females often have the preanal fold perfectly absent and no enlarged shield to indicate the few pores present in the male.

The only specimen I caught between the bark of a large tree near the top of the Government bungalow on Penang hill. I had at the time, I obtained it, considered it to be *Gymnodactylus pulchellus*, (Günth., l. cit. p. 113) which was also by Gray (Lizards, p. 173) described under *Cyrtodactylus*, but differs from that genus in the dis-

position of the femoral pores in an angular series. The coloration is quite the same in the present species as in *Gym. pulchellus* of which Cantor (Jour. Asiat. Soc. B. xvi., 1847, p. 632) says that is common in the houses on Penang hill; unfortunately I never saw this last one, though I looked very carefully after it. The present species, differs from this last by the peculiarly carinated scales, no enlarged chin shields or sub-caudals, and apparently more slender toes and fingers; it also has no enlarged femoral or preanal shield swhich, Cantor says, are in *G. pulchellus*, well developed, even in the female, though not pierced.

Total length 4 inches, the tail hardly less than the body.

Fam. Scincidæ.

24. *Tiliqua carinata*, Schneid.

Eup. rufescens apud Günth., l. cit., p. 79.
Eup. carinatus apud Steindachner, Rept. Novara, p. 43.

The brown variety with indistinct pale bands on each side of the back, with numerous obliquely ascending black streaks, and with white spots each margined black above and below, is common about Moulmein and down the Tenasserim coast.

The same variety, but on the upper portion of the sides usually marked with blood red, is common at Penang and also on the coast of the Welesley Province. One specimen from the last locality has on either side, a large red orange spot (turning in spirits into white), and no small ocelli. It has the vertical posteriorly united with the anterior occipitals, and the adjoining shields are also more or less confluent,—apparently this part has once been injured. The pre-frontal very narrowly touches the rostral, but in other specimens, this is quite separated by the supra-nasals. None of the Malayan specimens have a distinct trace of a pale band on the sides of the back. All I saw were of the usual size, 12-15 inches. Steindachner also mentions this species from the Nicobar islands; possibly the specimen, if not well preserved, may belong to the next which I believe to be new.

The largest specimen, I ever saw, is one lately sent to me by Mr. Röepstorff from the Andamans; it measures twenty inches, of which the tail is very nearly twelve inches, this last is more

flexible than in any other specimen I observed. The form of the head and the shields on it are perfectly the same as in other Indian and Malayan specimens; the supra-nasals form a short suture behind the rostral; there are only twenty-six longitudinal series of scales, these are large, tricarinate, the middle carina being weaker than the lateral ones. The specimen is above uniform, somewhat pale brown, paler on the sides towards the belly, and with a few indistinct darker spots, fore and hind limbs are above wholly spotted with white and dark brown; below yellowish white, tail leaden grey. It is a peculiarly large variety, but except in size and length of tail I can find no other specific distinction in the specimen. Possibly other specimens when found may exhibit greater variations from the type.

25. **Tiliqua rugifera,** n. sp., Pl. x, Fig. 3.

Body moderately stout, it and the head somewhat depressed, tail nearly one-third longer, sub-cylindrical, very gradually tapering. Fore-limb feeble, one when laid forward reaches to the anterior angle of the eye, hind limb very nearly as long as the distance between it and the fore-limb. The fingers are comparatively slightly developed: the thumb is moderate, shortest, the fifth finger about twice as long, the second very little longer than the fifth, and the third and fourth are sub-equal. The inner toe is the shortest, the second is double the length, then comes the fifth, then the third and the fourth is longest, being fully one-fourth longer than the third. Toes and fingers are slender and provided with small, moderately curved claws.

The rostral is broader than high, just reaching the top of the head; the pre-frontal forms a very narrow suture with it, as well as with the first pre-ocular on either side, and with the vertical, the larger sides between these narrow sutures being somewhat concave; post-frontals separated, on the side in contact with the two loreals; vertical elongated, tapering posteriorly, but terminating with an obtuse angle; four supraciliaries, moderately elevated, the fourth multicarinated and below followed by small shields; five occipitals, the first two narrow, forming a suture behind the vertical and scarcely reaching further posteriorly than the angle of the eye,

median occipital broadly oval, small, posterior occipitals very large. A rather elongated supra-nasal; nostril large, round, extending almost over the entire height of the nasal; two loreals, the posterior being much the larger one, three small upper and two somewhat enlarged inferior ante-oculars; lower eyelid scaly; seven low upper labials, the fifth is the longest, situated below the eye; ear moderately open, its inner edge with minute tubercles; lower rostral moderate, the shield next posterior to it small, single, followed by two diverging pairs of chin shields, very little larger than the rest; seven lower labials; preanal edge occupied by scarcely enlarged scales; sub-caudals single conspicuously larger than the row of smooth scales on either side. Scales in twenty-six longitudinal rows round the body, large, the upper and lateral ones strongly five carinated, the carinæ continuing very distinctly on the scales of the tail, giving the lizard a very ornamental but rough appearance; twenty-three transverse rows of scales between fore and hind limb; eight longitudinal rows of smooth scales on the belly.

Colour above and on the sides dark brown, paler on the head, upper labials yellowish, a greenish iridescent narrow streak extends from the supraciliary edge on each side of the humeral region posteriorly, another similar stripe begins at the end of the upper labial, both are margined with blackish brown, and nearly entirely disappear in about the middle of the body. There are besides two narrow longitudinal darkish stripes observable along the centre of the back, but they remain very indistinct; very few of the lateral scales are edged with greenish. Yellowish white below, with a greenish iridescent tinge, especially conspicuous on the sides of the neck and of the belly.

The more depressed and triangular head, smaller number of scales which are five carinated, and the differences in the frontals and coloration readily distinguish this species from *T. carinata*, Schneid.

I have only obtained a single specimen of this beautiful species on Camorta, (Nicobars), in the forest near the new settlement; it measures $4\frac{7}{8}$th inches, of which the tail is $2\frac{6}{8}$th inches.

Steindachner (Novara Reptilien, p. 48) describes from the Nicobars an *Euprepes macrotis*, Fitz., which appears to belong to the sub-division *Euprepis*, and is entirely distinct from the present

species. I have not as yet been able to obtain it from the Nicobars, but I have little doubt that Capt. Rundell who has taken a very great interest in the Reptile fauna of those islands will be successful in his endeavours.

26. *Tiliqua olivacea*, Gray (Günth., l. cit., p. 80).

Steindachner already notes the occurrence of this species on the Nicobars. It attains here the full size as at Penang. The specimens which I obtained from Camorta are of a uniform brown colour above, paler on the sides, greenish olive below, with some dark irregular spots along the lower labials, and an indistinct pale band along each side of the root of the tail; the edges of the eyelids are yellowish white.

The longer snout, smoother scales and very small opening of the ear readily distinguish this species from *T. carinata*, Schneid.

One of the specimens, measuring a little above eight inches, has twenty-eight long rows of scales, the other somewhat larger (with the body four inches, the tail being nearly 5) has only twenty-six rows of scales, and all the shields behind the occipital have grown together into one large shield, having evidently once been injured.

27. **Mabouya Jerdoniana**, n. sp. Pl. X, Fig. 4.

Habit moderately slender with a sub-cylindrical body, conical, somewhat depressed head and long tail, it being nearly one-third longer than the length of the body. One fore-limb, when laid forward, reaches a little in front of the eye; the hind limb is very nearly equal the distance between it and the fore-limb. The thumb and inner toe are the shortest; the second finger is double the length of the first, the fifth is sub-equal to the second, and the fourth is about one-fifth longer than the third. The second toe is fully twice as long as the first, the fifth distant, situated at the base of the sole and very little shorter than the third, but the fourth is one-fourth longer than the third. The palm and the sole are well developed and flattened, below covered with numerous sub-equal granular scales; toes and fingers are covered above and below with one row of transverse plates, the latter being considerably narrower than the former; claws moderatly curved and very sharp.

Rostral large, obtuse in front, forming a narrow suture with the pre-frontal, which is contracted on either side and posteriorly; posterior frontals form a very narrow suture; vertical, rather small, rectangular in front, and posteriorly reaching to about the middle between the eyes; seven supraciliaries, prominent and strongly arched, but the supraciliary edge itself is formed by about ten smaller scales; occipital sub-quadrangular, narrowly truncate in front, with concave front sides, broadest and angular below the middle, and slightly emarginated posteriorly; it is followed by several large post-occipitals, some of the temporals being also enlarged; one narrow, elongated supra-nasal on each side; nostril large, rounded; 2-3 loreals and 4 ante-oculars, the two upper ones being smallest; 8 upper labials, the sixth largest, situated below the eye, 8 narrow lower labials, the shields adjoining them being considerably enlarged, and the first chin shield is single and largest; lower eyelid with a large transparent disk; ear rather spacious, rounded without any perceptible spines or granules. Scales round the middle of the body in 37 longitudinal series, and there are about 60 transverse rows of scales between the fore and hind limb. The scales on the sides are only a little smaller than those on the belly and on the back; all are smooth, but with the lens many of the dorsal scales are seen in reflected light, very slightly longitudinally grooved. A series of eight scarcely larger scales forms the preanal edge; sub-caudals conspicuously enlarged.

Colour uniform, iridescent brown above, most of the scales with a large pale spot, and an indistinct pale band running from the nape on each side of the back and disappearing on the tail; below uniform yellowish white, leaden grey on the tail.

The only specimen figured was captured by me in a small temple on the little island Pulo Tickos, situated just to the north of Penang island; a few other specimens, I saw on the shore, but they escaped in crab holes under the refuse thrown out by the sea. A very similar, or the same species, I have also observed on one of the small islands near Singapore, but was not successful in capturing it.

The Penang specimen is $7\frac{3}{16}$ inches, the tail measuring 4, the posterior half appears to have been once injured, as the sub-caudal scales become rapidly much narrower, but occupying nearly the whole width.

I think Fitzinger's genus *Mabouya* should be accepted as emended by Gray (Lizards, p. 94), taking the West Indian *M. agilis* as type. It seems to form a very good natural group, apparently generically distinct from *Euprepes*, as restricted. The type of Wiegmanns *Eumeces* is according to Peters* *Scincus pavimentatus*, Geoff., and is the same as *Plestiodon* of Dum. and Bib., therefore *Mabouya* (as characterized by Gray) cannot be taken as subgeneric of *Eumeces*.

28. *Hinulia maculata*, Blyth, sp.

Lissonota maculata, Blyth, Journ. Asiat. Soc. Bengal, 1853, xxii, p. 653.
Mabouia maculata, apud Günther, l. cit. p. 84.
Hinulia maculata, apud Theobald, Cat. Rept. Asiat. Mus. p. 25.

Head rather short, sub-trigonal with an obtuse snout, rostral reaching far back to the surface of the head, the pre-frontal forms a suture with it and with the vertical, the post-frontals being rather small and widely separated; five supraciliaries, rather tumid; vertical, considerably narrowed posteriorly, almost terminating in a point, followed with the regular two pairs of occipitals, the hinder separated by an elongated shield; nostrils lateral at the base of a single shield reaching to the top of the head and bent over the canthus rostralis; fifth lower labial below the orbit, nearly as large as the sixth, which is often followed by a seventh small labial; two large loreals followed by two small shields superseding a single large one in front of the eye; eyelids scaly; opening of the ear elongately oval, vertical, rather large, with no spines in front.

There are 34-38 longitudinal series of scales round the middle of the body, and about 96 scales in one row between the front and hind leg; six pre-anal shields, the middle pair the largest and elongated; subcaudals enlarged. Fore foot when laid forward very nearly reaches the eye in some specimens, in others, it reaches even as far as the front edge of the eye; the hind-leg in some does not reach the axil, in others it does; as a rule, young specimens have longer limbs than old ones; the third and fourth fingers are subequal, the third being sometimes very little longer; the fourth toe is

* Monat. Akad. Berlin, 1864, p. 48.

very long and slender, about two-fifths longer than the third; thumb and inner toe are very short.

Brownish olive above, usually with two series of small black dots along the middle; sides with a black band above, commencing at the rostral, either uniform, or sometimes provided with white spots and margined above and below with an indistinct pale streak, continuing as a grey band with undulating margins to the tip of the tail; the lower half of the sides is in young specimens yellowish and spotted with black, as are likewise the upper and lower labials and the sides of the neck; in full grown specimens all these parts are densely marbled with blackish grey, the spots having become more or less confluent; the rest of the lower parts uniform whitish; the tail is in old specimens sometimes spotted with black; the legs appear to be above always spotted or marbled with the same colour.

I found this species very common at Martaban near Moulmein, but I scarcely observed a single specimen south of Moulmein, nor does it appear to extend further south into Welesley Province. Theobald says that it is very common in the forests of Pegu. My largest specimen measures $6\frac{3}{4}$ inches, of which the tail is 4 inches; it is proportionately longer in young specimens than it is in old ones.

The species is very closely allied to *H. indica*, Gray, (*Eumeces indicus* apud Günther, l. cit. p. 89, non *Mocoa Sikimensis*, Blyth), and I have given a detailed description of the former simply for the purpose of a close comparison of the two, for they may possibly turn out to be identical, the only appreciable difference of Blyth species from that of Gray, as recorded by Günther, being the larger number of supraciliaries and of the transverse series of scales between the front and hind limb. Are the latter really in such a small number present in *H. indica* as noted by Günther? If not, the two could scarcely be specifically different, and if the locality of the Cumingian specimen from Ningpo be correct, the species would after all seem to possess a wide geographical distribution.

H. maculata also occurs at the Andamans, though it is rare there.

29. **Riopa lineolata**, n. sp., Pl. X, Fig. 2.

Body very slender and long, almost of equal thickness through-

out, sub-cylindrical or slightly depressed; tail half an inch longer than the body, becoming very gradually thinner, till it terminates into a sharp point; feet moderately elongated and slender: fore foot nearly equal the distance between the rostrum and the ear, the thumb very small, the second finger is somewhat longer than the fifth, and both are shorter than the third and fourth which are sub-equal, the third being slightly longer; the claws are moderately curved and very sharply pointed; the length of hind limb equals the distance between the axil and the eye; the toes follow each other in length as 1, 5, 2, 3, 4, the last two being sub-equal and the second about half the length of the fourth, the claws are equally sharp as on the fingers. Opening of the ear moderate, rounded, with smooth edges.

The snout is rather short and obtuse; supra-nasals form a suture behind the rostral; anterior frontal occupies the whole breadth of the snout, and forms a very narrow suture with the vertical, just separating the post-frontals from each other; vertical, long, gradually attenuating posteriorly; supra-orbitals five, the last very small, somewhat tumescent; occipitals four, the anterior being united, and the one following it is rather small and triangular; upper and lower rostrals are large, obtuse; two loreals, the anterior smaller than the posterior; seven upper labials, being rather large and high, six lower labials, elongated and very narrow; first chin shield single, followed by two pairs of somewhat enlarged shields, having a small one between them; pre-anals very slightly enlarged. Scales smooth, transversely elongated and hexagonal, in 24-25 longitudinal series, and there are 60-65 scales in one row between fore and hind limb. The lower eyelid is scaly, but the scales are broad and more transparent in the centre than at the edges.

Colour greenish iridescent brown above, with an almost continuous series of small dark brown dots on each side of the back, beginning at the nape and margined above and below by a pale line; the centres of all scales above and on the sides are paler than at the edges, and form straight longitudinal lines; below whitish with a vinaceous tinge and distinctly reddish on the tail; the sutures between the labials are darker than the shields themselves.

I have obtained two specimens at the old Portuguese settlement of Martaban, opposite to Moulmein; the species does not seem to be common. The larger specimen measures 3½ inches of which the tail is 2; the other is only 2½″, of which the tail is very nearly 1⅔ inch, its head is considerably shorter and the snout more obtuse, than that of the larger specimen.

I consider *Riopa* to be a good distinct genus, or sub-genus, particularly characterized by the slender form of its body and feeble limbs. The present species appears very closely allied to *Eum. Bowringii*, (G ü n t h e r, l. cit., p. 91,) but this one has twenty-eight longitudinal series of scales and only thirty transverse series between fore and hind limbs; the scales must be, therefore, much longer, as G ü n t h e r ' s specimen is in measurements equal to the larger one from Martaban. Another allied form is *Riopa anguina*, T h e o b a l d, (Burmese Rept., p. 27 in Journ. Linn. Soc., London, Vol. X, Zoology), but this again has much shorter limbs, the hind one being "as long as from snout to ear, fore-limbs a trifle less," while in the present species the fore-limbs are considerably shorter than the hind limbs and the latter proportionately longer; the colour of *anguina* is also "uniform brown above with no markings." The number of scales &c. is not mentioned by T h e o b a l d, but even with the few differences noticed, it would impossible to regard them as belonging to one and the same species, though both come from the same region. T h e o b a l d in his Burmese Catalogue (p. 26) says of *E. Bowringii*, as having been captured at Thaiet-mio. The specimen, he states has "a minute lobe in front of the ear" and "an inconspicuous white streak from the eye down either side of the back, bordered below with black." These characters also don't agree with those of the species here described, but perhaps they do not exclude the possibility of either one or the other of Mr. T h e o b a l d ' s specimens being identical with *R. lineolata*.

Fam. AGAMIDÆ.

30. *Calotes mystaceus*, D. and B. (G ü n t h., l. cit. p. 141).

The peculiar coloration of this species has been noted by Mr. T h e o b a l d in his Cat. of Rept. in the Asiat. Soc. Museum, p. 36, and in

that of Burmese Reptiles (p. 33 in Ext. from Vol. X of Journ. Linn. Soc., London, Zool.). Male specimens when in breeding season have the lower labials, and the whole of the skin and throat beautifully blue black, the latter conspicuously mixed with red. One specimen from Moulmein (measuring 12¼ inches of which the tail is 8¼) has the crest high on the neck, but it becomes almost obsolete in half the length of the body; scales in 52 longitudinal series round the body. The largest specimen I measured was 16 inches total length, and it may even attain a larger size, though I never saw one of 24 inches, but it is no impossibility, as which Mr. Theobald appears to regard Günther's quotation.

That the crest almost totally disappears at half the length of the body is, I find, of common occurrence in Burmese specimens which I possess from Arracan, Bassein, Rangoon and Moulmein, and the throat seems to become blue in males and females, during the summer season at least; in the males, however, the red colour on the throat is prevalent, while it is almost wanting in the females.

Young specimens, four and five inches in length, have the head very short, thick, the centre of the occiput with a large plate surrounded by a few larger scales; the head has numerous dark cross bands, which on the body are somewhat more distant and angular; these specimens look so different that one would be inclined to regard them as belonging to a totally distinct species.

Down at Penang, the Welesley Province and Singapore I have not met with this species, it seems to be there replaced by *Bronchocele cristatella.*

In Mouat's Advent. and Res. among the Andaman Islanders (Lond., 1863, p. 365) Blyth states that this species has also been received from the Nicobars. Its occurrence is by no means improbable, but I have not received it from there, nor can I find a specimen of that species from the Nicobars in the Society's collection.

31. *Bronchocele cristatella,* Kuhl, (Günth., l. cit. p. 138).

During live the prevalent colour* is bright green, but the changes are almost quite as varied and instantaneously effected, as in a

* See also Peters in Monathsb. Berlin, Akad. for 1867.

Chameleon. The dorsal row of scales is in all appreciably enlarged. The labials are often black, and there are various black spots round the tympanum, and the sides of the belly or often partially or sometimes wholly black. In one specimen from Java, there are yellowish bands across the back as in *B. jubata.* The tail is usually light greenish or reddish brown, on the anterior half with some distinct whitish irregularly black-edged rings. There are also very commonly two small black spots on the top of the head, some distance behind the rostrum. Specimens from the Wellesley Province, Penang and Java have 38—40 scales on each side.

32. *Bronchocele moluccana*, Less. Peters (Berl. Akad. 1867, p. 16) considers this species as distinct from *cristatella.* One specimen from Singapore apparently belonging to this species has only 32 lateral rows of scales, but these are of perfectly the same small size and general character, as in *crystatella* from Penang. The specimen measures 16 inches, of which the tail is 13½ inches ; the colour is uniform bright green, the orbit, the extreme margins of the labials, the tympanum, a spot behind the same, and the whole of the sides black ; posterior part of the tail brownish. There is no difference in the shape of the head, or in the form and character of the scales on it and on the body from *crystatella.*

Steindachner (Rept. Nov., p. 27) mentions 2 specimens of *B. cristalella* from the Nicobars, possessing 29—31 rows of lateral scales ; these would very closely correspond with the Singapore form of *B. moluccana.*

33. *Bronchocele jubata*, D. and B. (Günth., l. cit. p. 139).

A large specimen from Java is bright green with the orbital skin, edge of the tympanum, and the labials black ; a yellowish elongated spot below the tympanum, five narrow cross bands of the same colour on the body, the first and last being between the fore and hind limbs ; tail brownish.

A variety apparently of this species occurs on the Nicobars. I received from Camorta four specimens, each about 18 inches long of which the tail is 14 inches. The general form of the lizard, number and size of scales, form of the crest and the two enlarged rows of a

few scales behind the eye are perfectly identical with those of *jubata*, but all four specimens have the head more depressed and the snout longer and somewhat narrower, than is the case in the Java specimen which I have for comparison. The upper labials are ten in the Nicobar and only eight in the Javanese specimen; the upper rostral is also much larger in the former than in the latter. Still considering all the other more important characters in a species I can regard the Nicobar form only as a variety of the Javanese one.

All Nicobar specimens are bright green, some of them bright yellow on the head and neck, the occipital skin, tympanum aud sometimes a spot on the top of the head behind the restrum are black; the gular sack bright brick red apparently in the male, and about four-fifth of the posterior portion of the tail is reddish brown.

Was the Pondicherry specimen, of which Dum. and Bibron speak, not received from the French Missionaries on the Nicobars through some friend in Pondicherry?

34. *Tiaris subcristata*, Blyth, (Günth., l. cit. p. 151).

Syn. Coryphophylax Maximiliani, Fitz. apud Steindachner, Novara Rept., p. 30.

This is an extremely variable species both as regards scales as well as coloration. The scales on the top of the snout are usually somewhat enlarged, and the median ones form a short carina; the canthus rostralis is sharp and continues on the supraciliary edge. On each side of the occiput, there is a group of large scales, and sometimes a distinct group in the middle between both. Irregularly scattered polyhedral scales are often found all round the tympanum, but they are scarcely in two specimens identically placed. In some large specimens there is one or two between the eye and the tympanum, one large one above it near the crest, and two somewhat smaller ones nearer the tympanum, one or two are situated behind, and one occasionally below. In young specimens these polyhedral scales are less numerous and sometimes reduced to but three. The centre of the tympanum is always hardened. There are eight or nine low, carinated upper labials, and generally 9 or 10 lower labials, similar in form to the others.

The scales of the body are very small, about 40—50 in a transverse

series on each side, intermixed with some large ones. In some specimens, the larger scales are only very few, in others they are scattered irregularly, and again in some they are partially arranged in regular longitudinal rows, and distinguished besides by a blackish mark on either side of each scale. Nearly in all specimens, there are some enlarged tubercles near the base of the tail; the ventral scales are in from 18—22 longitudinal rows; the subcaudals are in two rows, very sharply carinated. In young specimens, the nuchal crest is only indicated by a row of slightly enlarged scales, in old females it is still very small, but in the old males it is more developed, being considerably higher than the dorsal crest which continues to the end of the tail; this last is considerably compressed, entirely resembling in this respect other species of *Tiaris*. There is a well developed gular sack in male specimens, and a distinct shoulder-fold in all. The extremities and tail are very long; the fore limb is about as along as the distance between it and the hind limb, and the latter when laid forward, nearly reaches to the end of the snout. The thumb is the shortest, then comes the fifth finger which is half the length of the fourth, then the second, and the third and fourth are sub-equal, the last being slightly longer. The tarsus is very elongated, the first toe very small, the others follow each other as 2nd, 5th, 3rd, 4th, the last being remarkably long.

Color variable. Young specimens which always have the head remarkably short and blunt, are greenish ashy brown with numerous dark brown spots above and dark cross bands on the head, one spot in front between the eyes being especially conspicuous. Other young specimens and females are more uniform greenish, but almost always with some dark stripes in front of the shoulder. Male specimens are variously reticulated and obliquely striped with dark brown on the sides, the light interspaces being variegated with yellow and red; sometimes the whole back along the centre is purplish red, and the gular sack in the male is also reticulated with reddish, yellow and black. The red and yellow colours fade away very soon after the death of the animal. Numerous short blackish streaks always radiate all round from the eye; the labials are either dark spotted, or sometimes wholly blackish brown; the tail in encircled with broad dark bands.

My largest specimen measures 15 inches, of which the tail is about 11 inches.

This is a true arboreal lizard, tolerably common at the Andamans, and very common at the Nicobars. I found the jungles on Nancowry and Camorta swarming with specimens. They are extremely quick, and almost within a moment after they were first noticed they are again seen some twenty or thirty feet high upon a tree; and when followed up they do not hesitate to leap from one tree to another. Without shooting them it is scarcely possible to procure a specimen. I obtained more than a hundred specimens from the Nicobars alone, thinking that there may be a possibility of tracing some permanently distinctive characters in the Nicobar form, but they all proved identical with the Andaman species which was first described by Mr. B l y t h from Port Blair. There cannot be the least doubt of the two being the same, and I cannot even see any real generic distinction from *Tiaris*, as emended by G r a y. F i t z i n g e r's name *Coryphophylax* must, therefore, be considered as a synonym of the former.

35. *Draco volans*, L i n n. (G ü n t h., l. cit., p. 124).

This species appears to be more common in the jungles of the Wellesley Province and near Malacca, than it is on Penang itself. C a n t o r's description of the colours is excellent, the metallic bronze brown hue of the live lizard is wonderfully fine and brilliant. The black spot between the eyes appears quite constant, at least in male specimens. I only observed the gular sack to be uniform yellow, the lateral appendages and the throat are very pale or almost quite white and dark spotted. Limbs and tail are brown banded. There is behind the large rostral shield, a short longitudinal sharp ridge distinct, dividing in two, one branch leading to each eye. Beside the enlarged tubercular scale above the posteroir part of the orbit, there are 3—4 enlarged flattened scales placed in one row behind the orbit, and two small spines are above and one behind the tympanum. In most of the specimens there are also some larger spiny or tubercular scales conspicuous on the sides of the neck, as if indicating lateral crests which appear to be fully developed in *Dr. reticulatus*, G ü n t h.

OPHIDIA.

Fam. Tortricidæ.

36. *Cylindrophis rufus*, Laur. (Günth., l. cit. p. 179).

I have obtained specimens of this species from the hills north-east of Mandalay in upper Burma; it has already been recorded from Pegu by Mr. Theobald. The snout is sometimes considerably shorter in young specimens than it is in old ones and, therefore, its length in proportion to the width between the eyes is not a very good character for specific distinction, when compared with *C. maculatus*.

Fam. Colubridæ.

37. *Ablabes melanocephalus*, Gray (Günth., l. cit. p. 229).

I caught a specimen of this interesting species in the (so-called) botanic garden at Singapore. It measures 17¾ inches, of which the tail is 7¼ inches, a remarkably great length of the tail for an *Ablabes!* Ventrals 155, subcaudals 99, the last being as usually single, very much elongated and pointed. The distribution of the shields of the head perfectly agrees with Günther's description, and so does also the general character of colouring. The head is black, minutely freckled with white above, the upper labials white spotted with black at the lower margins and at the sutures; the white band continues a little beyond the gape, but is interrupted by a black spot on the 10th labial. The anterior half of the body is above brownish, the posterior blackish ashy; a pale brown somewhat indistinct band begins on either side of the back, behind the black collar, and is marked by a series of quadrangular equidistant black spots; it becomes a little more whitish on the posterior part of the body, and then the spots disappear. Lower parts whitish throughout; chin checkered with dark, each ventral with a black spot on either side; the spots, beginning to appear on the lower part of the neck, are first very small, increase gradually in size, until they form on the posterior part of the body a very distinct continuous strongly serrated black band.

38. *Ablabes Rappii*, Günther., (l. cit. p. 226).

A fine specimen was obtained by my collector in the neighbourhood of *Simla*. It measures 23 inches of which the tail is 5 inches; ventrals 196, subcaudals 67; uniform dark bronze brown above, yellowish white below, and on the lower part of the upper labials; chin and throat olive tinged; loreal small, nearly twice as long as high; temporals 1 + 1 + 2, the first very long, the others much shorter.

39. *Ablabes collaris*, Gray, (Günth., l. cit. p. 228).

This species appears to be rather rare in the low hills about Simla. One specimen obtained near Subathoo measured 22¼ inches, of which the tail is 7¾ inches; ventrals 184, anal bifid, subcaudals 113. General colour above greenish olive, head spotted with black, a short indistinct cross black band at the anterior- another near the posterior end of the vertical, a third curved one at the end of the occipitals; collar broad, black, edged with yellow posteriorly; the black spots forming the dorsal series on the fore part of the body very small, almost obsolete; tail with three blackish longitudinal bands; upper labials yellowish spotted with black, as is likewise the chin and partially also the throat. Lower parts dirty greenish white, purer posteriorly, each ventral and subcaudal with a black spot at the base forming a more or less continuous black streak.

The species also occurs near Darjeeling and in the Khasi hills.

40. **Ablabes Nicobariensis**, n. sp. Pl. XI, Fig. 1.

Body slender, head not distinctly separated from the neck, depressed, obtuse in front, scales smooth, in 17 series, ventrals 189, anal bifid, subcaudals 87. Rostral low, wide, not reaching to the top of the head, two pairs of frontals, anterior broader than long, about half the size of the posterior; vertical subtrigonal, large, with a very short point in front, and rapidly contracting posteriorly, somewhat longer than the supraciliaries; each occipital about one-fourth larger than the vertical, and extending anteriorly as low as the lower postocular; nasals in two shields; loreal united with the postnasal of which only a trace is visible on the left side, on the right side the postnasal is totally suppressed; preocular one, large,

squarish; postoculars two, small; seven upper labials, the third and fourth enter the orbit, the last is the largest; temporals $1 + 2 + \frac{1}{1+1}$ on the left, $1 + \frac{1}{1+1}$ on the right side. As usually in this section of *Ablabes* the upper parts of the upper labials are apt to be detached from the larger body of the shields, and form additional temporals; the first pair of lower labials forms a suture, and is followed by two pairs of subequal chin shields. Each maxillary armed with 14 small subequal teeth.

Anterior half of the body reddish brown above, posterior blackish grey. Head above blackish, the three first labials with yellow spots, a short broad yellow streak extends from behind and below the eye posteriorly to the angle of the mouth; collar black, margined on both sides with an interrupted yellow band, of which the anterior is the more distinct one; an indistinct series of blackish grey dorsal spots, almost forming a dark undulating band; sides of the body marbled and freckled blackish grey, this colour being separated from the upper brown one by a series of closely set black spots which are partially conspicuous on the posterior part of the body; chin dusky; all the other parts yellow with a vermilion tinge, each ventral with a large black spot near its base.

This peculiar form has quite the general character of coloration of *Ablabes melanocephalus*, but the spots on the sides of the dorsal region are more numerous and closer together; in the number of labials it on the other hand agrees with *Ablabes sagittarius*. The position of the united loreals is very peculiar, and perhaps not normal, but it is almost quite similar on both sides of the head, which externally strongly reminds of a *Callophis*.

I have obtained only a single specimen at the Nancowry haven on Camorta (Nicobars); it measures 17½ inches of which the tail is 4¼ inches.

41. *Ptyas mucosus*, L. (Günth. l. cit. p. 249).

This species is not uncommon on the Andamans. Young specimens have the scales quite smooth, each with two minute apical grooves; colour above pale brown finely reticulated with dark lines and narrow whitish cross bands; below uniform whitish.

An old specimen about 60 inches long, is uniform brown above,

yellowish white below; scales quite smooth; 9 upper labials of which the 5th and 6th enter the orbit, the three first ones are small and of the 4th the upper hind margin is detached, forming a third anteocular, the large anteocular proper being divided into two.

On the southern slopes of the North West Hymalayas, this species is one of the largest snakes to be met with. I observed it near Kishtwar at an elevation of 6000 feet; in the Kulu valley it is common between 4 and 5000 feet, and in the Sutlej valley beyond Kotegurh I saw it up to 7000 feet, but not far in the interior. Specimens from the latter locality are somewhat different in colour. One, apparently a male, measures 66½ inches, of which the tail is 16½, the scales are all, with the exception of the two outermost rows on either side, very sharply keeled; the anterior half of the body below is white, on the posterior each ventral and subcaudal is black edged. Another specimen 68½ inches, of which the tail is 18 inches, is a female; it has the scales smooth, with the exception of the three median rows which are very faintly keeled; all the ventrals are black edged in front, the last ones and the subcaudals almost wholly black. On the right side are 8, on the left 9 upper labials; of the third and fourth labials the hinder margins are detached and form a second small lower pre-ocular. Whether the presence or absence of keels on the scales has anything to do with the sexual distinction, remains yet to be more fully ascertained.

42. *Ptyas hexagonotus*,* Cantor, sp.

Xenelaphis id. apud Günther, l. cit. p. 251.

One full grown specimen from Penang measures 43 inches of which the tail is 13⅓ inches; scales in 17 rows, ventrals 200, subcaudals 118; uniform shining brown above, darker on the head and forepart of the body, paler almost leaden grey posteriorly, below albescent; six almost vertical blackish bands on either side of the neck, the first is shortest and situated at the angle of the gape.

I cannot see any sufficient reason for referring this species to a genus distinct from *Ptyas*. The entire habitus of the snake—moderate (17) number of rows of rather large smoothish scales,

* *hexahonotus* being to all appearance a misprint.

those of the vertebral series being generally larger than others, proportionate length of the tail (about or near $\frac{1}{3}$) to that of the body, moderately elongated head, roundish body with no perceptible keel on the ventrals, great number of ventrals and subcaudals, regularly arranged shields of the head, small subequal teeth of the jaws, and at last the habitat generally near the water, are all characters which distinguish the genus *Ptyas*, and in all these the above mentioned species agrees with the well known *Ptyas mucosus* and *Korros* as closely, as any allied species can possibly do. I found *Ptyas hexagonotus* in a pool of a fresh water stream on the northern side of the Penang island; one had swallowed a small fish and was evidently in search for other specimens. When attacked with a stick, it burrowed itself deeply in the mud, but did not leave the water.

The only difference which distinguishes *Ptyas hexagonotus* from the two other Indian species, is the presence of only one loreal, but as *Ptyas mucosus* has sometimes two in place of three loreals and *Ptyas Korros* occasionally one instead of two, I cannot see how such an insignificant and evidently very variable character could be looked upon as possessing generic value.

43. *Compsosoma radiatum*, Reinw. (Günth. l. cit. p. 243).

I obtained an interesting variety of this species near Moulmein, between brushwood on the ground.

The body is remarkably strongly compressed and the head flattened, and depressed. Total length 32 inches, of which the tail is 6 inches; scales in 19 rows, those of the anterior half of the body almost perfectly smooth, on the posterior half sharply keeled, with the exception of the two outer rows on each side; ventrals 257, anal entire, subcaudals 100; shields of the head regular; the anteocular and hinder end of the loreal are distinctly granular. Colour light leaden grey above, brown on the head, yellowish white below on the anterior part of the body, leaden grey on the posterior, and whitish on the tail; the four longitudinal dorsal black bands begin on the posterior part of the neck and disappear in half the length of the body; the short longitudinal streaks on the sides, along the base of the ventrals, begin immediately behind the base of the

tympanoid cross streak; sides of the body marked with indistinct vertically elongated whitish spots, margined with dark, and continuing up to the anal region, but disappearing on the tail.

44. *Compsosoma melanurum*, Schleg. (Günth. l. cit. p. 244).

A fine specimen measuring 55 inches (of which tail is only 7 inch.) was collected by Mr. Homfray on the Andaman islands. The general colour is uniform brown with some interrupted dark bands on the anterior half of the body, the posterior half of which is uniform blackish brown; throat pale yellowish; no trace of a dorsal longitudinal band is present. The single large ante- and the two small post-oculars are granulated, the former more distinctly than the latter; the temporals are 2 + 3, much elongated; the other shields of the head and the markings on the sides of the head normal. Scales in 19 rows, elongately rhombic, the dorsal ones strongly keeled, the three outer rows one each side almost perfectly smooth; ventrals 235; anal entire, subcaudals 60, tip of tail truncate, having been apparently once slightly injured.

45. *Compsosoma semifasciata*, Blyth, sp. Pl. XI, Fig. 2.

Platyceps semifasciatus, Blyth, Journ. Asiat. Soc. B., 1861, vol. XXIX, p. 114.—Günth. loc. cit. p. 237.

Coluber id., apud Theobald, Cat. of Rept. Asiat. Soc. B., 1868, p. 52.

A young but perfect specimen was obtained by my collector in the lower hills about Subathoo, south of Simla; it measures 11½ inches, of which the tail is three; scales smooth, in 19 rows, each with two minute apical grooves. Head distinct from neck, large and remarkably depressed; rostral broad at the base, deeply indented, only half as wide above than at its base, rounded and reaching to the top of the head; anterior frontals about two thirds the size of the posterior; vertical five-sided, straight in front, with concave sides and a rectangle posteriorly, the two sides forming it being the shortest; supraorbitals large and obtusely pointed in front, a little shorter than the vertical; occipitals very large, each about one-third longer and in proportion also broader than the vertical; nostril between two rather large nasals; loreal moderate with the lower hind angle pointed; two anteoculars, the upper large, reaching to the top of the

head and touching the vertical, the lower small, being strictly speaking only a detached portion of the third upper labial; postoculars two on the left side, upper larger than the lower (this appearing to be the normal state), three on the right one, the upper posterior edge of the sixth (or fifth) upper labial being detached from the rest; 9 upper labials, of which the fifth and sixth on either side enter the orbit, but it seems as if the third and fourth small shields should form together one, the third upper labial. Scales of the tail broadly hexagonal; ventrals 211; anal large, bifid; subcaudals 119. The first pair of lower labials forms a suture; two pairs of chin shields, the hinder slightly longer and moderately diverging.

Above, head brownish, with some dark markings on the occipitals; the rest of the body olive grey, with numerous short, rather broad blackish transverse bands, interrupted on the sides and alternating with lateral spots; all the dark markings disappear on the posterior two-fifths of the total length; pre- and post-oculars yellowish, a small dark, somewhat oblique spot below the eye. Below, uniform whitish throughout, with a slight dusky tinge; most of the ventrals have a small black spot at the base, at least as far as the upper black markings extend.

The form and general distribution of the largish shields of the head, the depressed, flattened head, numerous rows of scales, and the peculiar coloration of young specimens, all indicate the generic identity of the present species with *Compsosoma*, as has been suggested to me by Dr. Jerdon, after he had examined Blyth's original specimen, though this is not so perfect as the one here described.

46. *Compsosoma Hodgsoni*, Günther, (l. cit. p. 246).

Three specimens of this species were obtained by my collector in the lower hills to the south of Simla. In all of them the scales are elongantly hexagonal, but become considerably broader on the posterior part of the body.

a—Full grown; 63½ inches, of which the tail measures 13½ inches; ventrals 238, subcaudals 90; scales of the back distinctly though not very prominently keeled, each with two

apical grooves; eight upper labials, the fourth and fifth enter the orbit, and of the third the upper hinder angle is detached and forms a small lower anteocular; uniform olive above, pale yellowish below and on the upper labials; some of the ventrals partially blackish near their bases, as recorded by Günther.

b. and *c.*—These are two young specimens, measuring respectively $16\frac{3}{4}$ (of which tail $3\frac{1}{4}$) and $14\frac{3}{4}$ (of which tail $2\frac{3}{4}$) inches; in both the ventrals are 244, and the subcaudals 85 and 89 respectively. The scales are smooth, only in some parts on the posterior body scarcely perceptibly keeled, all with minute apical grooves. In *b* the shields of the head are perfectly regular, as described by Günther, three upper labials enter the orbit; in *c*, the posterior portion of the third upper labial is detached forming, as in the old specimen, a small lower anteocular, and moreover the large anteocular extends so far to the top of the head that it touches the vertical. The colour of both young specimens above is a pale olive grey with a dark blotch on the top of the head, extending over the vertical and the occipitals; the middle of the back is marked with numerous, rather wide blackish cross bands separated by interspaces of equal width, they become gradually obsolete on the tail; sides of the body densely reticulated with black; all ventrals more or less distinctly edged with dark, the larger basal spots being very conspicuous throughout; subcaudals uniform yellowish white.

47. *Tropidonotus quincunctiatus*, Schleg.
(Günth. l. cit. p. 260).

Trop. Tytleri, Blyth, Journ. Asiat. Soc., Bengal, 1863, XXXII, p. 88.

Trop. striolatus, Blyth, apud Theobald, Cat. Rept. Asiat. Soc. Mus. 1868, p. 55.

Not common about Moulmein and to the south of it. One specimen measured $23\frac{1}{2}$ inches of which the tail was only 1·4 inches; the black spots are at the neck in 5, round the middle of the body in 6 longitudinal series.

On the Andamans the species is also very common and attains a length of 40 inches, the tail being sometimes more than one third, in other specimens, however, scarcely more than one fourth of the total

length. All the Andaman specimens are generally dark brown, and have on the back of the fore part of the body two longitudinal black bands edged with whitish, and a pale band is also noticed on either side of the body; the three median rows of black spots are more or less confluent; on the posterior part of the body the longitudinal bands become obsolete, and the 5 rows of spots are very distinctly traceable. The subcaudals vary from 60 to 90, and the ventrals from 125 to 150. The Andaman variety has received on account of its peculiar coloration a new name by Blyth. The specimen described by Mr. Theobald as *T. striolatus*, Blyth, is to all appearance the same as the one published by Blyth under the name *Tytleri*. Blyth had first affixed the former name to the Museum label, but in writing his note about the snake, or during the press of the paper, he appears to have changed the specific name into *Tytleri*. It is, as already noticed, certainly only a variety of *quincunctiatus*, and I have other specimens from the Andamans which perfectly agree with the type, having the longitudinal bands obsolete, and again others which are almost uniform brown, having the dark spots nearly quite obsolete. The streaks below and posterior to the eye are never absent.

48. *Tropidonotus stolatus*, Linn. (Günth. l. cit. p. 266).

Common about Moulmein and at Amherst. In several specimens the longitudinal bands were on the front part of the body indistinct, and the posterior edges of the supraorbitals, occipitals and of the vertical were spotted with black.

49. *Tropidonotus platyceps*, Blyth, (Günther, loc. cit. p. 264).

Zamenis himalayanus, Steindachner, 1867, Verhandl. zool. bot. Gesellsch., Wien, XVII, p. 513, pl. XIII, fig. 1-3.

I obtained lately through my collector three specimens of this species from the Kulu vally. One is injured, it is a young specimen, and has the whole of the epidermis taken off. The snake then has a light bluish or leaden grey colour, many scales with white specks and the whole surface is checkered with black.

Another specimen is a *male*, 19 inches long of which the tail is 4½ inches; ventrals 205, subcaudals 82, all scales with the excep-

tion of the two outer rows on either side finely but very distinctly keeled. Shields of the head regular, as noted by Günther, loreal squarish but somewhat longer than high, temporals 1 + 1 + 2. Colour above dark brown, with an indistinct laterally compressed long eliptical mark on the neck and two rows of small blackish spots along the dorsal line, disappearing altogether on the posterior half of the body. A very distinct yellowish streak from the rostrum along the upper edges of the upper labials is margined with black on either side and disappears on the sides of the neck which has, however, at its base another short white streak traceable. Below yellowish, all over finely mottled with a dusky green and with another more distinct blackish band on each side; a coral red band runs along the bases of the ventral shields, and separates the upper brown from the lower yellow coloration.

A third specimen is a *female*; the scales are almost quite smooth, only those of the middle four rows show very indistinct traces of keels; total length 20 inches of which the tail is 5 inches, ventrals 203, subcaudals 86; the *loreal* is on both sides *united with the posterior nasal;* temporals and all other shields normal, as in the previous specimen. Colour light brown above, with a distinct laterally compressed eliptical mark on the neck, beginning with a single black line on the suture of the occipitals; several rows of small blackish dots on the anterior part of the body; the white black edged streak on the side of the head distinct, below uniform yellowish white with a dark line on each side, and a very faint trace of reddish along the bases of the ventrals.

The examination of these specimens appears to indicate that in this species the males have often the scales more distinctly keeled than the females. That the loreal is united in the female to the post nasal is most likely only accidental; similar cases of the head shields becoming confluent are by no means rare in other Colubridæ. The male seems to be darker in coloration and with a more distinct coral red lateral band, than it is in the female. The species does not appear to be common, but it occurs almost throughout the Central and North West Hymalayas, Dr. Jerdon having obtained it also in Cashmir. There can be no doubt that Steindachner's *Zamenis* is identical with *T. platyceps*, his

three specimens were all females with nearly quite smooth scales, and from the same locality as those noted above.

Fam. Dendrophidæ.

50. *Gonyosoma oxycephalum*, Boie, (Günth. l. cit. p. 294).

This species is not uncommon in the forests of the Andamans, it is generally seen on bushes near brackish water creeks, and is always ready to take the water, like a *Tragops*. It also occurs at the Nicobars. The colour above has a bluish tinge in some specimens, while the dark eye-streak is sometimes scarcely traceable; the lower parts are pale green, all the ventrals have the front edgings white, and their lateral angles are also marked by a pale whitish line. The rostral usually reaches to the top of the head and the anterior frontals are obtusely angular and narrow in front. A young specimen from Port Mouat measures 30¼ inches, of which the tail is 7½; ventrals 241, subcaudals 145.

51. *Dendrophis picta*, Gm. (Günth., l. cit. p. 297).

The bronze colouring alluded to by Günther chiefly refers to the epidermis, which is especially in specimens preserved for some time in spirit rather opaque*; the scales below it are bluish. Not unusually there are ten upper labials present instead of nine. In two specimens, obtained south of Moulmein, the lower lateral black stripe is very distinct, the upper faint, though it begins as a broad black band posterior to the eye, and is also marked in front of it, while on the contrary, the lower strip begins to be distinct only on the posterior portion of the neck and from there extends backward. This species is also common at the Nicobars and Andamans; the insular variety is always beautifully bright yellowish green during life, each dorsal scale is on the posterior half blackish, the cuticle on the adjoining six rows of elongated scales bronze brown, and the scales are more or less margined with black; the outer series of larger scales and all the ventrals are yellowish green, the latter with a slight bluish tinge. The ante and post-oculars are yellow, the black eye streak is rather thin, and in Nicobar specimens broken up into spots on the side of the throat; in some Andaman

* Of other *Dendrophidæ* and allied genera as well.

specimens it nearly entirely disappears on the throat, and there is no trace of it on the side of the body.

52. *Dendrophis caudilineata*, Gray, (Günth., l. cit. p. 297).

In a live specimen obtained at Penang, there are on the anterior half of the body six narrow black dorsal stripes beginning behind the neck, but as the epidermis is much opaque here, they are not very distinctly perceptible. In the middle of the body one stripe on either side of the two median dorsal ones becomes obsolete, and only four stripes continue up to the tail; the two lateral bands on each side are throughout distinct, the lower is much broader than the upper.

On no part of the body are there more than thirteen series of scales, (on the posterior only eleven). This is exactly the number observed on two Penang specimens by Cantor (vide Journal Asiatic Society, Bengal, vol. XVI, p. 933), while Günther gives "fifteen rows," which may either be a mistake, or possibly the Borneo specimens possess fifteen rows, for Günther's description may have been taken from them, there being no Penang specimen recorded in the British Museum Catalogue. Having alluded to the accurate description of Dr. Cantor, I hardly need to remark that there can be no doubt of the identity of the species with the one recorded by Günther.

53. *Chrysopelea ornata*, Shaw, (Günth., l. cit. p. 298).

The *var.* α of Günther is common on Penang. A vertebral series of spots occurs in all specimens, each spot being formed of three or four (or more) scales which are of a beautiful coral red in the live snake, but become yellow in spirit. In one specimen, the right loreal is on the left side united with its next posterior frontal, the other shields are normal; such abnormities in the arrangement of the shields of the head, differing on the two sides, are extremely common. In all specimens the ventrals have a narrow blackish edge, except those on the throat and for a short distance beyond, the *last two* in front of the anus are usually bifid. The maxilary teeth are all nearly equal, the last is often scarcely larger than the others, but in two apparently male specimens I have observed the 2nd and 4th anterior tooth to be distinctly larger than the rest.

As regards the habits of this snake, there seems to me to be a great deal of truth in Cantor's statement, that it is more frequently found on the ground between grass than on trees. I have myself caught on the Penang hill several specimens, all in grass or between low bushes along the edge of the foot path. Only once I saw a specimen on a bush, though not high up, but there can be little doubt that the snake makes also ample use of its eminent adaptness for movements on the trees. It is remarkable that this species seems to feed almost exclusively upon species of Geckotidæ, six specimens that I have examined at Penang all had parts of them in their stomach.

54. *Chrysopelea rubescens*, Gray, (Günth., loc. cit. p. 299).

I obtained a single specimen on Penang hill; it appears to be rare. It has 15 rows of scales on which the apical grooves are scarcely traceable. The shields of the head are normal, the vertical remarkably narrow, the posterior two-thirds of its length with concave sides; the occipitals are large and with narrow obtuse ends posteriorly.

The ground colour of the snake is a pale ashy grey, all over very minutely checkered with brown and white; some of the scales of the vertebral series have larger brown blotches, forming on the posterior half of the body an interrupted vertebral series; the posterior part of the head and neck are distinctly rufous brown. A pale streak runs along the median suture of the two pairs of frontals, another whitish streak runs from behind the eye posteriorly, bounded above and below with a brownish streak, a longitudinal brown streak occupies the middle of the neck; the rest of the head above is checkered and marbled with minute white dots and brown streaks; the upper labials are white, partially marked with brown dots; the lower parts of the head also white with minute brown specks. The throat is in the live snake of a beautiful yellow, this colour fading gradually until in about one-third the anterior length of the body it has changed to greyish brown; the parts below have a more distinct brown tinge than above, where it is more grey. Total length 28¾, of which the tail is 8½ inches; ventrals 196, anal bifid, subcaudals 136 pairs.

Fam. PSAMMOPHIDÆ.

55. *Psammophis condanurus*, Merr, (Günth., l. cit. p. 291).

Idem, Theobald, Journ. Linn. Soc., Zool. 1867, vol. X., Cat. Burm. Rept., extract, p. 43.

Phayrea isabellina, Theob., ibidem, and Catal. Rept. Asiat. Soc. Bengal, 1868, p. 51.

The head in this snake is elongately oval, obtusely rounded in front, distinct from neck in young specimens, but a little less so in full grown ones; scales in 17 rows, smooth, lanceolate,* those of the two last rows on each side rather larger and sub-quadrangular. The rostral shield often reaches to the upper surface of the head, and is posteriorly broadly rounded. The nostril is, in all specimens which I have examined, in one long shield; it is situated almost centrally and a distinct slit divides the lower portion of the nostril, but the upper is entire, though generally a faint groove extends from the nostril to the upper margin of the shield.

The fourth and last maxillary teeth are remarkably strongly enlarged and grooved at the outer bases, the latter is enclosed in a special pouch. Sometimes the two small teeth between the first and fourth are barely traceable.

I have received several specimens of this species through my collector from the sub-Hymalayan hills south of Simla (between 2 and 5,000 feet), and judging from these, the snake does not appear to be locally rare. The coloration is in all very much like that of a Pegu specimen presented by Mr. Theobald to the Asiatic Society Museum, and differs considerably from that recorded by Dr. Günther.

Above, isabelline brown, little darker in young than in old specimens. A median yellowish streak runs from the base of the rostral shield along the suture of the two pairs of frontals, divides at the base of the posterior frontals, the two branches continuing in subparallel undulating lines to the end of the occpitals, enclosing two or three irregular yellowish spots, or a short streak, and then extending along the whole of the dorsal region of the body, becoming, however, obsolete at the upper base of the tail. A second yellowish

* I cannot see to which scales of the body Mr. Theobald refers, when he calls them "hexagonal."

band originates at the top of the rostral shield, continues on either side along the supraciliary edge, and up to the tip of the tail; these two lateral bands are broader than the dorsal ones. A third broad band begins at the base of the rostral shield includes the upper labials and also extends the whole length of the body to the tip of the tail; these two bands are the widest, and each occupies the base of the ventrals and half the width of the adjoining scale, it is below bounded by a black line which becomes first apparent on the posterior part of the neck. All the other yellowish bands noted above are also black margined.

Below, uniform yellowish or whitish, sometimes with a faint bluish tinge.

Fam. Dryophidæ.

56. *Tragops fronticinctus*, Günth., (l. cit. p. 304).

There are in this species slight variations to be observed in the arrangement of the shields, &c. One, or both, anterior points of the anterior frontals touching the nasal are occasionally detached. The so-called detached portions of the anterior upper labials do not as a rule correspond in number and position with the true upper labials; the latter vary in number from 6-8, each of the two last ones being sometimes (though not commonly) divided into two.

When alive, the colour is grass green with a yellowish tinge especially on the forepart of the body and a slight bluish tinge along the whole of the under side, except the chin which is white. Theobald, (Journ. Lin. Soc. Zool. vol. X,) says that the colour is "bronze brown" which I never observed, in the live snake at least; it may be local and refer to very old specimens, or such in spirit. It is a true brackish water species; I found it abundant on the bushes near the mouth of the Moulmein river subject to the influence of the tide. It is as readily seen diving and swimming in the water, as climbing up a high bush or tree, and hiding itself in the green foliage. It always takes refuge in the water when attacked.

My largest specimen is 35 inches long, and has 202 ventrals and 142 subcaudals; these numbers are slightly in excess of those recorded by Günther.

Fam. Dipsasidæ.

57. *Dipsas hexagonotus*, Blyth, Pl. XI, Fig. 4.

Idem, Blyth, Journ. Asiat. Soc. Bengal, XXIV, p. 360; Günther, l. cit. p. 311.

Body slender, laterally very much compressed, tail roundish; scales smooth, in from 17-21 series (according to age,) those of the vertebral series hexagonal and conspicuously enlarged, ventrals 250-270, anal bifid, subcaudals 120-140. Head very large as compared with the slender body, moderately convex above; rostral broader than high, scarcely reaching to the top of the head; anterior frontals half the size of the posterior, obtusely rounded in front, vertical moderate, pentagonal, with concave sides, broader posteriorly than anteriorly, the hinder sides forming a rectangle; supraciliaries large, as long as the vertical and each as broad as the latter near its posterior end; occipitals large irregularly pentagonal, the lateral front angle of each just touching the upper postocular. Nostril rather large between two nasals, loreal squarish, narrower above and somewhat higher than long; one large preocular, reaching to the top of the head, but not extending to the vertical; eye very large and prominent; two subequal postoculars, the lower a little smaller than the upper. Upper labials 8, low, third, fourth and fifth enter the orbit; temporals small usually 3 + 3 + 3 or 4, sometimes 2 + 3 + 4, occasionally with small portions detached from various shields; very often there are two pairs of moderately enlarged shields behind the occipitals. Lower labials 10-11, the first pair forms a suture, the 7th-9th are the largest; two pairs of enlarged chin shields, the first is the larger and forms a suture, the shields of the second pair are diverging and usually separated by a few smaller shields.

General colour a beautiful coral red, above and below, head with a greenish smaragdine tinge above, a small black spot on each of the occipitals appears constant, some have a similar black dot on the vertical, or a short median streak on the anterior half of it; again others have a short lateral streak on each of the occipitals; on the upper labials and below white; body above marked with very numerous transverse blackish slightly undulating bands, separated by equally broad interspaces and laterally extending down to the ventral shields.

I have lately obtained a beautiful small specimen of this species through Mr. Homfray from Port Blair, Andaman islands, and I think there can be little doubt of its being distinct from *D. bubalina*, Klein. The size of the head with its short broad snout, and the form of the vertical readily distinguish it from this last. My specimen is only $11\frac{3}{4}$ inches, of which the tail is $2\frac{1}{2}$; the scales are perfectly smooth, on neck in 17, near the middle of the body in 19 series, the coloration perfectly agrees with that recorded by Blyth.

In the Asiatic Society's collection, there are four specimens, all rather bleached, the red colour having changed into a dull reddish grey; they are all from the Andamans (see Mouat's Adventures and Researches among the Andaman Islanders, 1863, p. 366). The largest specimen measures 18 inches of which the tail is $3\frac{3}{4}$, scales smooth in 21 rows, ventral 267, subcaudals 126; in another specimen, 17 inches long, there are very minute apical grooves perceptible on the middle rows of scales; it is possible that in the more adult snake, the apical grooves are better developed, though the species does not seem to grow to a very large size.

With regard to Blyth's *D. nigromarginata*, Theobald already observes (Cat. Rept. Mus. Asiat. Soc., 1868, p. 61) that its identity with *D. bubalina* is doubtful, and such certainly appears to be the case. The Khasi type specimen seems to be more slender, with a more distinct elongated head, and with markedly elongated pointed scales without apical grooves. Typical specimens of *bubalina* must be examined in order to decide the question, for in every other respect both species, no doubt, are very closely allied.

58. *Dipsas multifasciata*, Blyth, Pl. XI, fig. 6.
(Günth., l. cit. p. 313).

A very fine specimen of this species has been obtained by my collector in the hills about Simla; it measures $39\frac{1}{2}$ inches of which the tail is $7\frac{1}{2}$; scales smooth in 21 rows, those of the vertebral series conspicuously larger than others, most of which possess a very minute subapical groove; ventrals 248, anal large, semilunar entire, subcaudals 106. The shields of the head are regular and quite similarly distributed as those of *D. trigonata*; but the head itself appears

to be a little longer than in that species. In the figured specimen the nasals are markedly long, and the loreal touches on both sides the orbit with its posterior lower angle, reducing the anterior anteocular to a considerably small size; this is, however, evidently not the rule, for in B l y t h ' s original specimen, the loreal is of a normal shape, though the posterior lower angle is greatly prolonged; on the right side it does not reach the orbit, on the left it does, however, touch it; on the right side there is only one temporal, on the left two narrow ones, touching the two postoculars.

General colour light brown above, with a dorsal series of black irregular spots, single on the neck, double and obliquely placed on the body; the sides are marked with short black bands which in position alternate with the dorsal spots, and in addition to these there are small black dots at the base of the ventrals, each again corresponding to one dorsal spot. In B l y t h ' s original specimen which is a young one, the interspaces between the dorsal black spots are yellowish white, which colour seems to disappear with age. Head marbled with black above, with two not very clearly defined subparallel blackish bands on the occipitals, one single median on the neck, and one extending from the eye towards and across the angle of the mouth; the sutures between the upper labials and parts of the lower labials are black. Lower parts greenish white, all ventrals minutely freckled with black, and each with one irregular larger black spot on either side.

The coloration of this species appears sufficiently characteristic to distinguish it from *D. trigonata*, in which the lateral bands are confluent with the dorsal, or in fact the latter only extend partially to the sides; but I cannot see what difference there exists between *multifasciata* and *D. Ceylonensis*, G ü n t h., (l. cit. p. 314); the coloration of both seems almost identical, only in the latter species the head is apparently shorter, and the preocular larger, almost reaching to the vertical.

Fam. Lycodontidæ.

59. *Lycodon striatus* S h a w. (G ü n t h., l. cit. p. 318).

One specimen, obtained by my collector in the lower hills about Simla, measures 15½ inches, of which the tail is 3⅛; ventrals 182,

subcaudals 57 ; anterior frontals narrowly truncated in front and becoming gradually wider posteriorly ; vertical as long as broad anteriorly, occipitals about one-fourth longer ; other shields normal. Colour above blackish brown, with an indistinct collar, and 58 broadish yellowish white cross bands, irregularly divided and connected with each other on the sides; the scales of the tail are broadly hexagonal, there are five undulating whitish longitudinal bands on it, the middle one is made up of some larger spots. Chin, especially in front, and the subcaudals mottled greyish, the rest, below, yellowish white; each ventral and subcaudal with a distinct black spot at its base.

This is, I believe, the first recorded specimen of this species from the North West Himalayas, and others will no doubt also be found; it appears to be common in South India, and was supposed to be peculiar to the Peninsula. In Russel's figure, the transverse dorsal bands are somewhat wider and less numerous than they are in the Himalayan specimen, but there is no other difference between the two.

60. *Lycodon aulicus*, Linn. (Günth., l. cit. p. 316).

Xenopeltis unicolor, Rein., Theob., ex parte, specimen *d*, quoted from the Andamans, Cat. Rept. Asiat. Soc. Museum, p. 64.

Tytleria hypsirhinoides, Theobald, (type) ibidem, p. 66.

„ „ „ Journ. Linn. Soc., Zool. vol. X, extract, Cat. Burmese Reptiles, p. 49.

In his Catalogue of Reptiles in the Asiatic Society's Museum, which was written in 1865, but unfortunately not published till 1868, Mr. Theobald placed one full grown unicolored Andaman specimen under *Xenopeltis unicolor*,* and another still larger unicoloured specimen, also from the Andamans, he called *Tytleria hypsirhinoides ;* this last is apparently the same which Blyth in Journal Asiatic Society, Bengal, 1860, vol., XXIX, p. 110 quotes as "*Lycodon aulicus*, (L.) Uniformly coloured variety."

I have examined both the specimens, and there can be no doubt as to their identity with *Lycodon aulicus*. The peculiar depressed head with a broad flat snout is alluded to by Mr. Theobald

* This evidently is an accidental mistake ; the snake resembles in its uniform colour to X. *unicolor*, and Mr. Theobald, when noting it, evidently omitted to take it out of the bottle.

in his reference to the similarity of this snake with *Hypsirhina*, though I don't think that there really exists such a particularly great similarity between both. Among the 50 or 60 specimens of *Lycodon aulicus* which I saw, and of which I received numerous specimens from the Andamans and Nicobars, I found a good deal of variation (though no essential ones) among the shields of the head. In some specimens only the third and fourth upper labials enter the orbit, in others the fourth and fifth, but as a rule all three enter the orbit. I never found more than one elongated loreal and one anteocular, but there are either two or three postoculars, and the differences often occur in one and the same specimen on the two sides of the head. The temporal shields are usually quite similar to the other scales, generally there are two in contact with the postoculars, and the upper one is somewhat more elongated than the lower. Sometimes the upper is confluent with the occipitals, as likewise one or two shields following it; in other specimens again, the lower first temporal seems to have become obsolete or confluent with the adjoining labials; in both these cases, there is only one temporal in contact with the postoculars, and these differences are again often to be observed on the two sides of the head of one and the same specimen. There are almost invariably nine upper and ten lower labials; the first pair of the latter forms a suture, followed by two pairs of elongated chin shields, and the sixth lower labials are always the largest; the anterior frontals are always smaller than the posterior &c., &c.

Comparing Mr. T h e o b a l d' s description of *Tytleria hypsirhinoides*, there is actually no difference in the structure of the snake from *L. aulicus*, as Mr. T h e o b a l d himself, I believe, now admits. In the specimen referred to *X. unicolor*, there is only one temporal in contact with the postoculars. In both, the dentition is typical, each has an enlarged front fang, followed by small teeth in the maxillary.

Young specimens usually are variously mottled with yellowish and brown. Some of the Andaman specimens only possess numerous small brown specks, the prevalent colour being yellowish white, others are chiefly brown with large yellowish transverse bands or blotches.

Full, or nearly full, grown specimens become uniform brown above, whitish below. The upper brown colour is distinctly defined from the lower white one at the lateral angle of the ventrals. In one of my Nicobar specimens this angle is pure white, and more than the basal half of each ventral is ashy brown, the subcaudals are nearly all white. This same specimen has the whole length of the body a median dorsal pale yellowish brown band, and one or two hardly conspicuous darker bands on either side. However, it must be remarked that this uniform colouring is not always a sign of maturity; it seems to be rather local, for there are often large specimens seen with various spots and blotches of brown and yellow.

Steindachner (Novara Rept. p. 74) quotes *L. aulicus* from Java and from Amoy, which again indicates the relation of the Nicobar to the Javaen Reptile fauna, and of both through the Andamans to Arracan and Burma. Fitzinger appears to have favoured the species also with a new name, *L. capucinus*.

61. *Tetragonosoma effrene*, Cantor, (*variat.*) Pl. XI, Fig. 3, (Günth., l. cit. p. 320).

I have obtained a fine specimen of what appears to be an adult of this species from Banca, but as it shews some marked differences from the type, I have given a view of the head and append a description, in order to facilitate comparison.

Body slender, head depressed, distinct from neck, long, with a broad rounded snout. Scales smooth in 17 rows, those of the back larger than at the sides, hexagonal or pentagonal; total length 31½ inches, of which the tail is 6½″, being very slender; ventrals 223, anal bifid; subcaudals 84.

Rostral shield low, much broader than high, deeply indented at the base, anterior frontals irregularly squarish, about one-third the size of the posterior; vertical subtrigonal, with convergent sides which are, however, somewhat irregular and incline to form an angle near the posterior end; supraorbitals of moderate size, shorter than vertical; occipitals much longer than broad, obtusely and narrowly truncate behind; upper labials 9, the first is the smallest, the second the largest, the third, fourth and fifth enter the orbit; the greater

part of the second and the upper anterior edge of the third are in contact with the posterior frontal; anteocular one, postoculars three on the right, two on the left side, the lowest being united to the fifth labial; temporals 2 + pl.; pupil large, vertical; mental groove distinct; 9 lower labials, each nearly corresponding to each upper, the first pair forms a long suture; three pairs of chin shields, the first is divergent above, the last behind.

Colour deep blackish brown above with some very minute white specks at the sides of the head and on the body; uniform ruddy or dark brown below. The fifth and sixth teeth in the upper jaw are much enlarged; after a short gape they are followed by 12 smaller teeth, the next ones behind the fangs are the smallest and they gradually but slightly increase toward the posterior end; very numerous small teeth on the palate; the third tooth on each side in the lower jaw is the largest.

Comparing the form of the head of our specimen with Günther's figure of the type, the vertical is seen to be longer in the former and of a subtriangular shape, but there appears to be an inclination to pentagonal form; in the other shields there is no essential difference. The snout of our specimen is decidedly much broader, but I attribute this simply to the development of the front fangs of the jaws, for similar, or even greater, variations can be observed in the different stages of age in all the Lycodontidæ; the preocular is placed a little higher in our specimen than in the type.

Dr. Günther says that in the young type specimen there are eleven distant buff coloured rings round the body and tail, but that the posterior become obsolete with age, only the three or four anterior remaining visible. This last observation evidently refers to the only other known specimen of the species, *Lyc. ophiteoides* of Bleeker, (from Borneo), which Dr. Günther considers identical with the former. My specimen is 4½ inches longer than Bleeker's type, and it may, therefore, not unreasonably be supposed that even the anterior rings became obsolete with advanced age; and that such is actually the case, I have but very little doubt. I only need to recall what I have said of the changes of coloration in old specimens of *Lycodon aulicus*, the adult of which is thoroughly unlike

the young one! The change from variegated to uniform colouring in most of the LYCODONTIDÆ, as far as we know them when adult, is a remarkable fact which commends itself to further investigation by Herpetologists. I would have scarcely hesitated to describe the above noted specimen under a new specific name, had I not seen those most remarkable changes in coloration of *Lycodon aulicus*, for they appear simply to repeat themselves in *Tetragonosoma*.

Fam. PYTHONIDÆ.

62. *Python molurus*, L i n n. (G ü n t h., l. cit. p. 331).

In a young (1½ foot long) specimen from the Wellesley Province, there are on the left side 1 supra, 4 post-, 2 infra-, and 2 ante-oculars; on the right side only 1 infra-ocular; similar abnormities being very common in other snakes also. On each side there are 11 upper labials, the sixth's placed below the orbit, but none enters it, the two first are provided with long pits; 19 lower labials on each side, narrow and long, of the first eight each has above an irregular blackish spot, the second, third, fourth and fifth are slightly impressed but not deeply pitted; the 12th and 13th low labials each also has a black spot, and the large blackish blotch begins on one side on the 14th, on the other on 15th labial. The number of scales round the body was in several male specimens nearly normal, 65, as stated by G ü n t h e r, but of six specimens which I have examined, scarcely in two were the number of shields and scales on the head perfectly similar and equally numerous. This species is certainly less frequent in the Malayan peninsula than the next, but I have seen several specimens obtained in the Wellesley province.

63. *Python reticulatus*, S c h n e i d. (G ü n t h., l. cit. p. 330).

B l y t h (Journal, Asiatic Society B., XV, 1846, p. 377) was correct in supposing that it is this species which occurs on the Nicobars. I have lately obtained from Camorta one specimen measuring 110 inches, of which the tail is 14 inches; scales round the body in 72 series, ventrals 323, some of the before last bifid, last entire semilunar; subcaudals 98. Behind the posterior frontals there is one pair of largish shields, followed by two other pairs, in one line, the inner smaller than the outer, then comes the vertical;

three loreals, two smaller superseding a long lower one ; three anteoculars, one large superseding two small ones, a single labial below the orbit. The five first upper labials are deeply pitted on either side, and of the lower labials the 9th—13th are pitted. Coloration typical, as in Malayan specimens.

Fam. Homalopsidæ.

64. *Hypsirhina plumbea*, Boie, (Günther, l. cit. p. 280). A specimen from the Irravadi river near Mandaley measures 17 inches, the head being $\frac{8}{10}$ inch., and the tail $2\frac{1}{4}$ inches ; ventrals 122 of which the last two are bifid, subcaudals 33 ; the anterior frontal is fully two-thirds the width of both the posterior, occipitals obtusely pointed behind ; each anterior chin-shield fully one-third longer than one posterior. Colour above and on the front of the chin slightly extending backward, leaden grey, below albescent yellowish with a median brownish line on the lower part of the body extending to the subcaudals, where it is as usually most distinct. Other specimens from Moulmein don't differ from Günther's and Theobald's account of the snake.

65. *Cerberus rhynchops*, Schneid. (Günth., l. cit. p. 279). This is a very common species about Amherst, occurring in brackish and in pure sea water together with *Hipistes hydrinus ;* but unlike this last, it goes far inland, and haunts with equal ferocity after fish &c., in fresh water pools, &c. One half grown specimen from Amherst, measured 27 inches, the tail being 4·6 inches, it has has only 144 ventrals, but 64 subcaudals. Scales always in 25 rows. The largest specimens measures 50 inches. All specimens are above greenish grey, when young with numerous blackish cross bands above, and, below, sometimes almost wholly black with only a few whitish or pale blotches ; with age the upper cross bands become less distinct, being partially broken up into spots, until they disappear ; a black strip begins on either side at the snout, passes through the eye, touches the angle of the mouth and disappears on the posterior part of the neck ; upper labials and sides of head pale.

The number of upper labials sometimes rises as high as 12 ; the last five being small and corresponding to only three superimposed

shields which represent the true labials; all the upper as well as the lower labials, and all the shields of the head are finely granular. In a specimen from the Nancowry haven (Nicobars) there are ten upper labials, the last two corresponding to only one upper portion. This specimen is uniform dark greenish above, on the last three series of scales on either side conspicuously yellowish; ventrals, to a great extent, and the subcaudals wholly black; the black eye streak is hardly perceptible; total length 26 inches, of which the tail is $4\frac{3}{4}$ inches, ventrals 152, subcaudals 53.

A specimen from the Andamans measures $32\frac{3}{4}$ inches, of which the tail is $6\frac{1}{2}$, being remarkably long; the dark cross bands above are rather distinct, and the whole of the lower parts is mostly black; there are 11 upper labials, the last four corresponding to only two upper portions; ventrals 149, subcaudals 63. Another specimen is quite similar, but has a row of large blackish spots on each side of the body, and a narrow central black line along the ventrals.

66. *Hipistes hydrinus*, Cant. (Günth., l. cit. p. 287).

This is a very common species at the mouth of the Moulmein river, especially near Amherst; it lives almost entirely upon fish, and may be said to be rather a brackish than a salt water inhabitant. The largest specimen, I obtained, measured $22\frac{1}{2}$ inches, of which the tail is only $1\frac{1}{2}$; ventrals 165, subcaudals 27. I have seen about 50 live specimens and all had the tail remarkably short, the number of subcaudals varying from 22-35, the terminal scale being always very strong and conically produced; the number of rows of scales varied from 38 to 42. The supraorbital is occasionally divided in two; there are two pairs of chin shields, one behind the other in one row, the two first are large, in contact with 4—5 broad labials, each second is only one-third of the length of one first; sometimes a third pair of chin shields is indicated.

Young specimens often have a marked yellowish green tinge; older ones are above dull greenish grey with 38—45 broad bluish black transverse bands, generally a little narrower than the interspaces; the lower parts are pale yellowish and the median portion of

the ventrals mostly tinged or finely checkered with dark grey. The snake is considered by the natives to be poisonous, though of course without any reason. When placed on the ground it moves without difficulty and, as Dr. C a n t o r says, does "not offer to bite," but when excited it is very fierce, attacking everything that comes near. Having been assured by the natives of the dangerous bite of this snake, I took, on leaving Amherst, two live specimens in my boat, for the purpose of making some experiments during a prolonged row up the river, in order to see whether the bite would have any effect upon fish or fowl, but my men got so alarmed that I had to kill the snakes. There is, however, no doubt that the species is harmless.

Cantoria, G i r a r d, (G ü n t h e r, l. cit. p. 277).

E. D. C o p e (Proc. Acad. N. S. Phil., 1866, p. 312,) first observed that *Hydrodipsas*, P e t e r s, is identical with *Cantoria*, an opinion which is also endorsed by R e i n h a r d t, and a comparison of P e t e r s' figure in Monathsb. Berlin Akad., 1859, p. 270, fig. 1, leaves no doubt about it; the Bornean species *Hydrodipsas elapiformis*, P e t e r s, also appears to be the same as *Cant. elongata*, in which case, however, the former specific name will have the priority.

67. **Cantoria Dayana**, n. sp., Pl. XI, Fig. 5.

Body long, slender, subcylindrical, head not distinct from neck, obtusely rounded in front. Scales smooth, elongately hexagonal, in 19 series, ventrals 268, anal bifid, subcaudals 56, in two rows. Rostral pentagonal, broad, deeply indented below, very narrow above, with concave sides; anterior frontal almost linear, in contact with the rostral, little widening posteriorly, separating the two large elongately quadrangular nasals, and scarcely longer than these; posterior frontals two, each irregularly hexagonal, forming a short suture, and being in contact with the anterior frontal, the nasal, loreal, pre- and supra-oculars; vertical large six sided, with an obtuse angle in front, with very slightly converging sides, posteriorly forming almost a rectangle; occipital considerably longer than vertical, obtuse and slightly diverging posteriorly; supraciliaries moderate. Five high upper labials, the suture of the third and fourth is below the eye, but none enters the orbit; loreal squarish a little

longer than high; one narrow but high pre-ocular, reaching to the top of the head, and in contact with the posterior frontals; two post-oculars, the lower one forming the edge of the orbit and joining the pre-ocular; temporal $1 + \frac{1}{pl}$, there being one conspicuously large, second temporal behind the first in contact with the occipitals. Eight lower labials, the two first form a short suture and are followed by two pairs of subequal chin-shields.

Colour above dull yellow with numerous broad bluish black bands, separated on the back by narrower interspaces, becoming rapidly wider at the sides, and the black bands are obsolete before they reach the ventrals; on the posterior part of the body some of the bands are confluent, and on the tail they even partially form rings; head with a yellow band across the posterior frontals, dark on the top (including the eyes), with a few yellow spots on the occipitals and vertical; below uniform pale yellow with a dusky greenish tinge along the middle of the ventrals.

There are four teeth in each maxillary, the last is the largest and indistinctly grooved; on one side one small additional tooth is between the first and second, and another one between this and the third.

A single specimen was obtained by me near Amherst at the mouth of the Moulmein river in brackish water; it measures 30½ inches of which the tail is 3½. In coloration and general habit it strongly resembles *Hipistes hydrinus*, in company of which it was procured, but it appears to be very rare. Captain G. E. Fryer sent about ten fishermen for me to work; they brought in one morning at least 60 specimens of *Hipistes hydrinus* and a great many *Cerberus*, but only a single specimen of this new species. I have great pleasure in naming it after my friend, Surgeon F. Day, whose pleasant company made my short stay in the neighbourhood of Moulmein quite as instructive, as it was a source of recreation and of pleasure.

Fam. Elapidæ.

68. *Bangurus cæruleus*, Schneid. (Günth. l. cit. p. 343).

A specimen obtained by Dr. Day at Bassein (Brit. Burma) measures 41 inches of which the tail is 5½ inches; ventrals 224, sub-

caudals 52 ; back crossed with 52 transverse oblique bands, indistinct on the neck, narrow along the vertebral series, but broad at the sides, some of them extending at their base over the length of 3-4 scales, others being bifid, and consequently narrow ; some of the ventrals with lateral dark spots on the posterior two-thirds of the body, along the central line checkered with dark, and each of the subcaudals has a blackish spot near the centre.

This species appears to be very rare in Burma ; Mr. Theobald (Cat. Rept. Brit. Burma, extract p. 62, Journ. Linn. Soc. Zool. vol. X) observes that he never obtained it himself, neither in Pegu, nor in Tenasserim.

69. *Ophiophagus elaps*, Schleg., Pl. xi, fig. 7 ; (Günth., l. cit. p. 341).

The variety described by Mr. Theobald from Burma (Journal Linn. Soc., Zool. vol. X, extract, p. 60) also occurs on the Andamans, but does not appear to be common. Mr. Röepstorff obtained near Port Blair a specimen of nearly six feet in length, it is uniform olive brown above on the anterior one fourth of the body, then a number of distant transverse yellowish bands with black edges begin to appear, and continue up to the tail, where each scale has a yellowish centre with black edges, and besides that there are numerous narrow black bands on it. Below, the front part is uniform yellowish white, in the middle only a few ventrals are black edged, on the posterior part all the ventrals and subcaudals are half yellowish half black. The three first subcaudals, two about the middle, and one a little further on are entire, all others bifid. The poisonous gland is rather elongated and situated immediately behind the posterior angle of the eye, extending to the tympanoid region.

Considering the general characters of this species, its form, coloration of the adult, number of rows of scales and the shields of the head, there would hardly seem sufficient reason for separating it as a genus distinct from *Naja*, the only difference from the latter being, the presence of two large shields behind the occipitals, and if these were not present, it would be often almost impossible to distinguish *N. tripudians* from *O. elaps*, for in many varieties of both

the colouring is found to be quite the same, and in some of *tripudians* the temporals are in position, size and number perfectly identical with those of *elaps*. This last, when disturbed, raises the front part of the body exactly like a Cobra, but does not distend the neck to any considerable extent, though it has it distinctly flattened, as is also the case in some varieties of *tripudians*.

The young of *O. elaps* is so thoroughly different in coloration from the full grown snake, that few would hesitate in considering it a new species. Dr. D a y obtained N. E. of Moulmein a specimen (see fig. 7, pl. xi) measuring 20½ inches, of which the tail is 3¼ inches, ventrals 262, anal very large, subcaudals 87, the first 5 entire, the others bifid. The head is broader and flatter, as compared with that of adult specimens, the snout is remarkably short, blunt, the occipitals longer than in any old specimens I have seen; other shields and scales normal. The coloration is pure jet black, the snout, a band in front of the eyes, a third posterior to them, broken up into large spots, a forth across the posterior end of the occipitals broken up into six spots, 32 narrow equidistant rings on the body directed forward along the dorsal line, and 11 rings on the tail as well as its extreme tip are yellowish white; chin and throat uniform yellowish; the rings of the body become much wider on the belly, leaving only black bands of 2-4 shields width between them; on the posterior part the black prevails, the white bands become interrupted, but on the tail the rings are again complete. Dr. G ü n t h e r notices the coloration of a young *O. elaps*, but as it is not usually known, I have given a figure of the specimen alluded to. In the old snake the white bands gradually become less distinct and sometimes nearly quite disappear, the black colour being also replaced by uniform brown. The general character of coloration of the young *elaps* most markedly recalls that of *Xenurelaps bunguroides*, of which we as yet only know young specimens.

70. *Naja tripudians*, M e r r. (G ü n t h., l. cit. p. 338).

A young specimen, (14 inches of which the tail is 2¼ inches) from the neighbourhood of Kotegurh (elevation between 5 and 7000 feet), is uniform olive grey above, whitish below, with three blackish cross bands on the neck, on the upper side of which only

a few blackish marks are indicated; scales in 23 rows, posterior frontals markedly smaller than the anterior, which form only a very narrow suture, eighth upper labials, the second and third small, situated below the posterior nasal shield, the fourth and fifth enter the orbit, the eight labial is the longest of all, but only as high as the second and third; the first lower labials form a long suture; the preanal is entire but deeply grooved in the middle, the groove beginning at the previous shield; the second and third subcaudals are entire.

I have often observed uniformly olive coloured full grown specimens on the hills between Simla and Missúri and the plains, but whether they offer similar variations in the head shields, as the young form I have just noted, I am unfortunately not in a position to ascertain just at present.

This wide spread species also occurs on the Andaman islands, but does not seem to be common. One specimen, 22 inches long, lately sent to me by Mr. H o m f r a y is, above, markedly blackish brown with very numerous, narrow, transverse, slightly angular pale bands, the angles being directed forward; a single large pale spot with a blackish centre on the middle of the neck; below, the chin and anterior part of the throat are yellowish, followed by two indistinct, broad, dark cross bands; the rest of the lower part is greenish ashy, the subcaudal scales are divided by a zigzag blackish line. A full grown snake from the Andamans does not exhibit any difference from the continental form. The species is as yet unknown at the Nicobars.

71. *Callophis intestinalis*, L a u r. (G ü n t h e r. l. cit. p. 348).

I received a specimen of this interesting species from Upper Burma. It is brown with the pale dorsal streak one scale broad; the black borders on either side are not very conspicuous; the lateral stripe is pure white, slightly narrower than the dorsal, and is situated between the last and before last series of scales. Ventrals 267.

The poison glands are of exactly the same shape as described in this species by Mr. M a y e r in a paper lately (1869) published in the Monathsberichte of the Berlin Akademy. They are

somewhat more than one-third of the length of the body, running along the ventral side and accompanying laterally the alimentary and respiratory canal &c. Their anterior half is extremely thin, after which they gradually thicken, terminating in front of the heart with club-shaped ends, being here partially surrounded by the parenchyma of the internal organs. There is a perceptible thickening of the muscles to be observed here, and when seen externally the body is slightly thicker where the poison glands terminate. This most remarkable physiological phenomenon, consisting in the prolongation of the poison glands has, to all appearance, its reason in the slenderness of the snake, its head being so small, that there does not seem to be sufficient room for the development of the poison gland and of the muscles required to produce upon it the pressure necessary for the ejection of the poison.

I was told that this little snake is more dreaded by the natives of Burma and of Java on account of its bite, than the comparatively gigantic *Ophiophagus elaps*, S c h l e g.

Fam. Hydrophidæ.

72. *Enhydrina Valakadyen*, B o i e, sp., 1827.

Syn. *Enhydrina Bengalensis*, G r a y, (G ü n t h e r, l. cit. p. 381).

73. *Enhydrina schistosa*, D a u d. (G ü n t h e r, l. cit.).

Russell (Ind. Serpents part II, pls. x and xi) very properly pointed out the distinction of his *Valakadyen* and *Hoogli pattee*, according to native accounts. There can be little doubt that he had two distinct species before him, but the latter does not appear to be nearly as common as the former, at least I can find in the Asiatic Society's collections no specimen of it among many of *Valakadyen*; neither does a specimen of it appear to exist in the British Museum collection.

I have lately obtained from Dr. D a y two specimens of *E. Valakadyen* from Orissa, and one specimen from Gopalpore, the latter being to all appearance identical with *Hoogli pattee* of Russell, or *Enh. sehistosa*, D a u d.

The principal characters of *E. Valakadyen* are a subcylindrical body, covered with hexagonal or suboval scales, carinated in the centre, the scales being, as Russell remarks, rather conti-

guous than imbricated. The head is stout, rather wide at the base, with a moderate gape of the mouth, the shields of the upper head are in all specimens, I saw, more or less granular; the scales are on the neck (about 2 inches behind the head) in from 38-44 series, they are ovately elongated, and very slightly imbricated; further on the scales are distinctly hexagonal and round the middle of the body in 48-50 longitudinal series. The tail is broad, its length being little more than one-seventh of the body; one specimen measures 33½ inches, of which the tail is 4½.

The Gopalpore specimen represents an altogether more slender form, and the tail measures a little more than one-tenth of that of the body, being proportionately rather narrow or less high than that of *Valakadyen*. As compared with this last named species, *E. schistosa* has the head more ovately prolonged, and the gape wider, consequently all the shields of the head are also a little more elongated, and all are perfectly smooth; the postocular is in this particular specimen united to the fourth upper labial; the scales on the neck are from 58-60 longitudinal series, they are very much elongated, pointed and imbricated. The body is more compressed than in *Valakadyen*, the scales on it are along the back much elongated, imbricated, and carinated, on the sides more oval or hexagonal and less distinctly keeled; round the middle they vary in from 66-70 longitudinal series.

In coloration, both species appear to be very much alike, and this was probably the principal reason, that they had been considered as one and the same species, though Gray, I think, very correctly remarks (Viperine snakes, p. 49) when speaking of *Enh. Valakadyen* (which is Boie's *Hydrus Valakadyen*,* and the same as *E. Bengalensis*), "Schlegel states that *Hoogli pattee*, Russell, ... is a half grown specimen of this species; but this is inconsistent with Russell's description and figure of the head shields."

74. *Pelamis platurus*, Linn.

P. bicolor, Schneid., (Günth. l. cit. p. 382).

A large specimen from the Orissa coast has each scale impressed in the middle. A small specimen caught by Captain G. E. Fryer

* Or *Valakadyn*, which is evidently only an incorrect copy of Russell's name.

to the south of Ceylon is uniformly black above, yellow at the sides and below, with remarkably elongated long blackish brown spots at the sides; tail reticulated with yellow and black; the scales are almost smooth.

The species was taken also near the Andamans and the Nicobars; it seems to be common all through the eastern seas.

Fam. Crotalidæ.

Trimeresurus, Lacep.

The difficulty in discriminating various species of this genus is well known. There is hardly a single character which could be confidently relied upon as constant, but the average number of rows of the scales and their form, as well as the shape of the head appear to be more useful in the determination of species than any other character, this of course applying to specimens of about equal size. The number of small shields behind the rostral is very variable, and the second upper labial is sometimes divided in two parts on one side, while it remains single on the other in one and the same specimen! The size of the supraciliaries is, however, tolerably constant.

The effect of the bite of a *Trimeresurus* does not as a rule appear to be nearly so fatal, as is for instance that of *Daboia Russellii*. This is often due to the difficulty accompanying the ready use of the long and rather strongly bent fangs, but mainly, I think, to the smaller size of the poison gland. The last is situated in *Trimeresurus* along the lower posterior edge of the maxillary, covered above by the masseter and post-temporal muscles, and laterally only by the skin; its form is simple, not provided with any appendages, as in the Cobra. The small size of this gland in some species, as for instance in *T. Cantoris* from the Nicobars, is very remarkable, for in some specimens between 3 and 4 feet in length it is not much longer than half an inch, and about a quarter of an inch high, with a canal in front, of about half an inch, leading to the fang. Dr. Rink says that, during his stay at the Nicobars, he was informed of the existence of great many vipers in the jungles, but he never heard of a fatal case resulting from their bite. Occasionally, he says, a native was seen with a swollen foot, but it always soon passed away. I made in-

quiries on this point when visiting the Nicobars, and was told the same account. Subsequently, my collector heard the same from the natives who procured for him nearly all the *Trimeresuri* which he brought back. I believe that the species chiefly live here on insects. It really seems that the size of the poison gland, and consequently the quantity of secreted poison, varies according to the necessity which arises for its use. In some specimens of *Cantoris* the gland is, for instance, considerably smaller than in specimens of half the size of the allied *viridis* at Moulmein, or *carinatus* from the Himalayas.

I have lately examined about 70 or 80 specimens of *Trimeresurus*, belonging to several species; all these snakes are eminently arboreal and generally found on high grass or on bushes.

Theobald, in his Cat. of Rept. Asiatic Society's Museum, pp. 75-76, described two apparently Indian species as *T. Andersoni* and *obscurus*. The latter has entirely the type of the coloration of the former, and is no doubt specifically identical with it. Both have 25 rows of strongly keeled scales, the former specimen has 182 ventrals and 56 subcaudals; the latter also 182 ventrals and 71 subcaudals, the third and fourth shields being entire.

75. *T. gramineus*, Shaw, (Günth. l. cit. p. 388).

Body grass green; head moderately elongated and high; form 19-21 rows of large elongated strongly carinated, pointed scales. The species appears common in the Khasi hills and in Assam. I have never observed it in the interior of the N. W. Hymalayas, though I often procured *T. carinatus*, but Dr. Günther mentions it even from "Ladak." It would be interesting to know which part of the country is alluded to, for Ladak proper has scarcely any arboreal vegetation, except a few poplars and willows in the Indus valley. I passed three times through Ladak (I mean the upper Indus valley about Lei and the elevated country on both sides of it), but I never saw yet a single snake, and the existence of a *Trimeresurus* is of all the most improbable in a country situated above 10,000 feet, and subject to the most rigidly cold climate, so that hardly any arboreal vegetation can thrive.

T. Cantoris of Blyth is, as Dr. Günther rightly supposes, quite a distinct species, and will be noticed further on.

76. *Trimeresurus erythrurus*, Cantor, (Günther, l. cit. p. 386).

The head in this species is elongately oval, more depressed than in either *T. gramineus* and *T. carinatus;* the usual number of rows of scales is 23 in adult specimens, 21 in young ones; the scales are elongated, pointed and strongly carinated. There are mostly 11-12 upper labials, and usually only one row of scales between the labials and the infraoculars. The supranasals form a broad suture behind the rostral, but sometimes a small azygous shield is present. All the specimens, I have seen, had the lips and chin white, the lateral line was also always distinctly white, bordered with greenish or purple below; general color uniform green above, tail ruddy.

I found this species common on the limestone hills near Moulmein; and also obtained specimens from Upper Burma, from Penang and the Wellesley province; it is always more slender than *T. carinatus.* One specimen from Moulmein measures 25 inches of which the tail is 5, 23 rows of scales, ventrals 157, subcaudals 63; another young specimen is 10½, of which the tail is 2½, scales in 21 rows only, ventrals 167, subcaudals 63, the second, fifth and sixth are entire, the other bifid.

A specimen from Java measures 21½ inches, it has 170 ventrals and 75 subcaudals, the colour of this and of other Penang and Javanese specimens always appears to be darker green with a bluish tinge, while Moulmein specimens are bright green, but there is no difference in structure between both.

77. *Trimeresurus carinatus*, Gray, (Günth., l. cit. p. 386).

This species has 23-25 rows of scales, exceptionally only 22 or 21. The scales are elongated, larger than in either of the two last named species, sharply carinated; the head is short and high, there being mostly two rows of shields between the infraoculars and the labials, the latter are generally ten in number; there are usually one or two azygous shields present, very rarely there is no azygous shield, but in such a case the supranasals just touch each other, not forming a broad suture, as in *erythrurus;* the supraciliaries are very large. The general color is usually green, sometimes there are large blackish spots at the sides; the lateral line is either

well developed, white, margined with coral red below, or it is absent; tail pale ruddy above, usually equal to one-sixth of the total length.

One specimen from Moulmein measures 27¼ inches, of which the tail is 4½, scales in 23 rows, ventrals 155, subcaudals 51, one azygous shield. A young specimen from the hills, N. E. of Simla (about 6000 feet) is 11¾ inches, of which the tail is 2½, ventrals 163, subcaudals 74, the fifth and ninth being entire. An other adult specimen from the same locality has no azygous shield, it measures 35¼ inches, of which the tail is 5¼; ventrals 173, subcaudals 62; on the neck there are 22, round the middle of the body only 21 series of scales, the reverse being often the case in other specimens.

Three specimens, in the Asiatic Society's collection, from Bengal, each has 25 rows of scales, they are uniform green. It is very difficult to distinguish some specimens of this species from *gramineus*, especially when the number of rows of scales is as low as 21; such specimens could be referred to either of the species, the only criterion in favor of *carinatus* being the short and rather broad, stout head, and the large size of the supraciliaries.

I have not seen any typical specimens of *carinatus* from the Andamans, those which have been referred to it appear to be really distinct and belong to the next species.

78. *Trimeresurus porphyraceus*, Blyth, Pl. XII, Fig. 2.

Blyth, Journal Asiatic Society, Bengal, 1860, vol. XXIX, p. 111.

Theobald, in Journal Linn. Society London, vol. X, Zool. (Extract, p. 64).

Body rather slender with a large elongately triangular head; scales usually in 25 series, narrow, elongated, sharply pointed and carinated; supranasals small with one large azygous shield between them; supraciliaries narrow, as in *gramineus*; upper labials 12-14, the posterior nine or ten markedly small, the second forms the front of the facial pit; scales on the head keeled, all of moderate subequal size, those on the front part flattened.

A half grown specimen measures 25¾ inches of which the tail is 3¾; the first labial is united with the nasal; ventrals 180; anal narrowly projecting, semilunar, entire; subcaudals 55.

General color above dull green with a fine porphyraceous lustre throughout, sides of the posterior one-third of the body and tail with

some indistinct large porphyraceous spots, upper lip and below whitish with a greenish tinge ; lateral line sometimes indicated, but usually not marked at all.

Mr. Blyth first pointed out the peculiar colouring of this species as distinct from that of *gramineus*, to which he afterwards referred it on account of the similar form in the shields of the head. In consequence of the greater number of rows of scales, and their similar form, the species has been considered by Günther as identical with *carinatus ;* but, setting aside coloration, the scales of *porphyraceus* are much narrower and more slender, and the ventrals are conspicuously narrower and in a greater number present, the supraciliaries narrow, the labials more numerous and the head a little less high than in *carinatus*. The peculiar porphyraceous tint of the dull green colour is very marked, and well preserved specimens can be readily distinguished by it from either *gramineus* or *carinatus*. The species seems tolerably common on the Andamans about Port Blair. The specimens marked *b* and *c* of *T. carinatus* in Theobald's Cat. of Rept. Asiatic Soc., Museum, p. 74, belong to *porphyraceus*, and probably also those marked *f*, but they are not well preserved, one has only 23 rows of scales.

79. **Trimeresurus mutabilis,** n. sp. Pl. XII, Fig. 5.

Body slender ; head elongated, rather depressed, with the snout moderately narrowed and rounded, equal to about one-twentieth of the total length ; tail strongly prehensile and short, being one-sixth or one-seventh (or even less than that) of the total length.

Scales in 21 series, subquadrangular, slightly keeled, posteriorly obtusely pointed ; ventrals from 156-167 ; anal entire ; subcaudals 48-62 ; last scale large conical ; head covered with small, subequal flattened smooth scales, one azygous shield between a pair of supranasals, supraciliaries narrow and long ; sometimes divided in two parts ; a single long infraocular extending posteriorly, leaving room only for two or three small postoculars ; upper labials 9-10, the first is in all the specimens examined united to the nasal, the separation being only indicated by a groove ; the second is narrow, usually single, and generally forms the front of the facial pit, but sometimes it is divided into two shields ; in the

figured specimen it is normal on the left, divided on the right side, the shield, forming the front of the facial pit, being separated from the labial; in another specimen it is normal on the right, and divided on the left side, the labial proper being again separated into two shields. These alterations in the form of the second upper labial are principally to be observed in the banded variety, which will be immediately referred to. The third labial is as usually the largest and the size of the following gradually decreases; there is mostly only one series of scales between the infra-ocular and the labials, sometimes one or two additional minute shields are interposed.

The coloration is subject to great variation. Some specimens which appear to be males are more slender than others, and with a proportionately longer tail; they are dark blackish brown on the head, olive brown above, on the body either uniform or with some of the scales lighter, and with numerous greenish white and dark margined cross-bands, these being either regular, or broken up in halves, these again partially alternating with each other; there is an indistinct narrow pale longitudinal streak on the neck, and an oblique streak runs from the eye down each temporal region; a very conspicuous white streak originates at the base of the rostral, ascends to the orbit, passing along the infra-ocular, and then again descends to the angle of the mouth, meeting the temporal streak on the neck and continuing along the bases of the ventrals as a series of white spots, having dark brown spots below them. The sides of the body are marked by two longitudinal greenish white bands, separated by a brown band which is sometimes broken up into streaks and spots. In some specimens, the dorsal cross bands become indistinct, and in others—which are rather stout, with short tails and some of which certainly are females,—the color is above uniform reddish brown, darker on the head, paler at the sides, and sprinkled all over with coral red. Sometimes a narrow yellowish and reddish band is conspicuous along the two outer series of scales on either side. The upper labials are more or less whitish ashy; a rather indistinct whitish streak margined with black above, and sometimes also below, runs from the eye towards the angle of the mouth. Below, the color is pale yellowish or greyish, densely and finely marbled and freckled with dark and red, especially on the

throat and fore-part of the belly; the bases of the ventrals are usually conspicuously darker than their centres. The tail is above always coral red, or reddish brown, below darker, being marbled and spotted with dark brown.

This species recalls the variability of coloration noticed in *T. Wagleri*, Schleg., (Günth., loc. cit. p. 388), and I was at first much inclined to refer it to that species, but as the Nicobar form always has only 21 rows* of very slightly keeled and rather large scales, both must be kept distinct. Whether any of the numerous species, which Gray describes in his Catalogue of Viperine snakes, (p. 9-11) and which Günther considers as varieties of *T. Wagleri*, are identical with the Nicobar form, it is impossible to decide from Gray's descriptions. I have never noticed in *T. mutabilis* that the squarish dark bands or spots extend on to the sides, much less on the belly; they are strictly dorsal, and each separated from the next by a narrow pale greenish band which is connected with with the lateral longitudinal band of the same pale color. The unicolored variety strongly resembles *T. purpureus*, Gray, (Günth. l. cit. p. 387), but the more slender habit, prehensile tail, smoothish scales in 21 rows, readily distinguish both.

As compared with *T. porphyraceous*, the distinctions just noticed are equally valid; the number of ventrals is in the present species conspicuously smaller than in the former. With *T. gramineus*, the number of series of scales agrees, but their form and slight carination as well as the shape of the head, and other characters do not admit a specific identification. Steindachner (Reptiles of the Novara, p. 86) mentions three rather much injured specimens of *T. purpureus* from the Nicobars; he does not record the number of rows of scales, but as these specimens were previously referred by Fitzinger to *T. viridis*, Daud. (*gramineus*, Shaw), I suspect that they belong to the unicoloured variety of the present species.

I have examined one specimen from the Andamans, 19½ inches long, of which the tail is 2¾, ventrals 163, subcaudals 52, (3rd and 7th entire); color uniform above, paler and conspicuously reddish at the sides, with an indistinct darker longitudinal band in the middle;

* Cantor says that in his *puniceus* (= *purpureus*) he counted once as many as 31 rows of scales.

sides of head blackish, hinder upper labials pale; below greenish sprinkled with reddish and dark brown. From Camorta, one of the Nicobar islands, I obtained about 12 specimens. The measurements of the four principal varieties are as follows :—

a. Total length 18⅜ inch.; tail 2⅜ inch.; ventrals 167; subcad. 50, belly conspicuously yellowish, nearly uniform greenish brown above.

b. tot. length 16 inch.; tail 2¼ inch; vent. 156; subc. 48; uniform.

c. „ „ 18½ „ „ 2½ „ „ 160; „ 50; „

d. „ „ 18⅜ „ „ 3⅛ „ „ 164; „ 62; banded.

80. *Trimeresurus Cantoris*, B l y t h, Pl. XII, Figs. 3-4.

Trigonocephalus Cantori, B l y t h, Journal Asiatic Society, Bengal, 1846, XV, p. 377.

Trimeresurus viridis, var. *Cantori*, B l y t h, ibid. 1860, vol. XIX, p. 110.

Body moderately slender, with a large triangular, rather high head, (being about one-twentieth of the total length), and a proportionately short tail, varrying in length from one-seventh to one-ninth of the total length of the body.

Scales narrow, elongated, distinctly keeled in 27-31 series, the most usual number being 29. Scales on the top of the head very small, almost tubercular, equal; one (rarely two) small azygous shield between the supranasals which are of moderate size; supraciliaries narrow, elongated, sometimes divided in two shields; upper labials 11-12, first united with the nasal, second forms the front of the facial pit, third, as usually, the largest; one long, linear infra-ocular extending posteriorly, usually two small post-oculars; two rows of shields between the infra-ocular and the labials. Ventrals* 174-184; anal entire, narrowly semicircular and freely projecting; subcaudals 55-76.

The general color is light, or more usually dull green, with several series of dark alternately placed spots; a white lateral streak on the head beginning at the rostral ascending to the eye and then continuing to the angle of the mouth is often present, it is margined above and below with darker green, but it becomes obsolete with age; a narrow white lateral band begining at the posterior neck, occupying half the width of the outermost row of scales on either side, edged with dark below and extending up to the end of the tail, is always present. Below, whitish or greenish with the bases

* B l y t h's type of *Cantoris* has 182 ventrals and 76 subcaudals.

of the ventrals dark ashy, or blackish in more fully grown specimens; tail strongly prehensile, laterally compressed, and always provided with largish dark spots, its ground color being a light or whitish grey.

The following are the principal variations of coloring &c., which I have observed in specimens of various sizes; with one exception the specimens are all from the Nicobars:—

a. and *b.* Total length 12 inches, of which the tail is 2 inches, 27 rows of scales, ventrals 174, subcaudals 75, the last very large, cylindrical: dull green with five alternating series of small dark spots on the body, a white streak on the head and on the side of the body; below, greyish white; length of head $\frac{12}{16}$ inches, width at the base $\frac{9}{16}$ inches. Another young specimen, perfectly similar in coloration, measures about 14 inches, but the lateral streak on the head is absent.

As regards the very small size of the scales on the body and on the head, as well as regards the coloration &c., these two specimens so very much agree with the description given by Steindachner of *Trim. labialis*, Fitz. (Novara exped., Reptilia, p. 86, pl. 3, fig. 1,) that I am very much inclined to believe the latter to be only a variety of *T. Cantoris*. Steindachner mentions, however, only 23 rows of scales, while in 14 specimens which I have examined, of all ages, the number of rows was never less than 27 and usually 28 or 29. Could perhaps 23 be a misprint for 28? Further in *T. labialis*, the supranasals are contiguous, but this character is of little value, as in some of our specimens the single azygous shield is almost obsolete, though always present. Fitzinger's species cannot be referred to *T. mutabilis* which never has more than 21 rows of very much larger scales, particularly those of the head; its coloration also does not agree with that of the last mentioned species.

c. Total length $19\frac{3}{4}$ inches, tail $2\frac{3}{4}$; 29 series of scales, ventrals 184, subcaudals 62; bright green above with some indistinct dark spots, eye streak indistinct, lateral band distinct; pale green below; tail ashy, spotted with brown, (From Port Blair).

d. Total length $22\frac{1}{2}$, tail $4\frac{1}{2}$ inches; 28-29 series of scales, ventrals 174, subcaudals 73, the 11th and 14th are entire; dull green above, paler at the sides, greenish white below, lateral streak on the head and body distinct.

e. Total length $23\frac{3}{4}''$, tail $3''$; 29 series of scales, ventrals 175, subcaudals 57; length of head $1\frac{1}{4}''$, its width at the base 1 inch; dull green above with some dark spots on the head and body, whitish below with the base of ventrals dark, lateral band distinct; sides of head pale, but no trace of a distinct streak.

f. Total length $33\frac{1}{2}$ inches, tail $4\frac{1}{8}''$, length of head $1\frac{3}{4}'$, width $1\frac{1}{8}''$; 29 rows of scales, ventrals 182, subcaudals 60; dark brown above with many scales partially or wholly of a greenish lighter color, and with large brownish pale spots on the

top of head; below whitish, all over sprinkled with dark, bases of ventrals blackish, tail below mostly black.

g. Total length 44 inches, tail 5⅝″; length of head 2½′ its width at base 1½″, 31 series of scales; ventrals 176, subcaudals 62; light brown with numerous pale scales, the lateral white band partially yellow, top of head with indistinct dark and pale spots.

h. Total length 48½″, tail 6¾″, head 2⅛″, its width at base 1½″; ventrals 178, subcaudals 63; general color greenish brown with pale spots, each scale of the lateral white band has a distinct yellow spot. This is the largest specimen observed.

From what I have already noticed there can be no doubt that the present species is quite distinct from either, *T. viridis* or *gramineus*, of which Blyth considered it at one time to be only a variety. The great number of small, carinated scales which are almost granular on the head is especially characteristic for *T. Cantoris*. In Blyth's original description the number of subcaudals should be 76 instead of 214, which is a misprint, the number of ventrals is about 180 in the type specimen, which is, however, considerably injured and shrunk. The species is very common on the Nicobars and also occurs on the Andamans.

81. **Trimeresurus convictus**, n. sp. Pl. XII, Fig. 1.

Body stout and short; scales rhombic, moderately keeled in 21 series; ventrals 132, anal entire, subcaudals 29; head broadly eliptical, covered with largish, smooth scales; rostral very high, obtusely truncate above with a small shield adjoining, behind which a pair of largish suprarostral shields forms a suture, two other shields on either edge between them, and then follow the supraciliaries which are very large and broadly rounded posteriorly; the second upper labial forms the front of the facial pit; numerous small shields between the lower edge of the orbit and the upper labials, which are eight in number.

Color, above, pale brown, with minute dark specks; head uniform dark brown, with a small yellowish spot in the middle of the tympanoid region, a U-mark on the neck, and a series of large quadrangular more or less confluent or alternating brown spots along the back, sides marbled with brown and pale yellow, one series of brown spots above the bases of the ventrals being rather more conspicuous than others; below, greenish or yellowish white, all over

minutely freckled with brown; chin yellowish brown with rather large light spots; a broad pale band runs from the rostral through the eye to the tympanoid region, a narrow white somewhat undulating streak from behind and below the eye to beyond the angle of the mouth and continuing for some distance on the sides of the throat. Total length 14¼ inches, of which the tail measures 1⅞ inches.

I long hesitated to separate this species from the Hymalayan *T. monticola*, Günth., (l. cit. p. 388), there being hardly any difference in coloration between the two, but the robust form of the body, eliptical rather high head, covered above with largish shields, short tail, and rhombic markedly broad scales, arranged in 21 rows, seem to be sufficient characters to recognise the Penang form as a separate species; in *T. monticola* the scales of the body are much more elongated, the number of small shields above the rostral varies between 1 and $\frac{1}{1}$ or $\frac{1+1}{1}$ or $\frac{1+1}{1+1}$; these azygous shields appear to be more numerous in the young than in the old snakes.

The only specimen I obtained, near the top of the so called Western hill on Penang, at an elevation of about 2400 feet. It was lying, (on an early morning and after a rainy night), near a dead branch in the middle of the path, when an old convict coolie who accompanied me was just too late for my calling out to him, and unfortunately stepped on the snake, which turned round and struck him on the left foot a little in front of the ankle. The man was shivering dreadfully with fright. I was only a few yards off, secured the snake, which made hardly an attempt to move off, made the man sit down and suck the wound for about ten minutes, both the punctures having drawn blood; but it was evident that the fangs could not have penetrated deep, for the snake was unable to close his jaws sufficiently well at the place where it struck. I had the snake in my hand and explained to the man that it is only a very small specimen, and not one of the very poisonous kind; this seemed to relieve a little his mind, though the poor fellow (who had been for the last 20 years a convict in Penang and employed in clearing jungle), was well acquainted with the danger he run into. After sucking the wound for the first ten minutes, I gave the man free use of my brandy flask, which he certainly appreciated. He then continued sucking for about five or six minutes longer, took a mouth-

ful of tobacco, rubbed some of the juice on the wound, and declared himself ready to prosecute the stroll. I thought a long walk might do the man good. It was about 8 A. M., when he was bitten, and we returned home about 4 in the afternoon; the man accompanied me for three successive days afterwards, and did not complain of any symptoms whatever, not even of a swelling of the wounded part, which is so common after the bite of the Nicobar *Trimeresuri*.

82. *Halys hymalayanus*, G ü n t h., (l. cit. p. 393).

idem, S t e i n d a c h n e r, Reptiles of the Novara exped. p. 87.

The rostral is as broad as, or broader at its base than, high, but only of half the width at the top, where it touches the anterior frontals. The upper ground colour of this snake varies from brownish green to almost brownish black, but generally with some lighter spots, bands or marblings, and that of the lower parts is a greenish yellow with purple tinge, the purplish color sometimes predominating, especially on the subcaudals; the whole of the lower side is more or less strongly marbled with greenish black, rarely is the underside nearly all black, but the chin is always yellowish. The upper labials are yellowish white, and in continuation of this color there is, in younger specimens, a very conspicuous whitish lateral band, occupying the base of the ventrals and the adjoining row of scales. In old specimens, this lateral band is only indicated on the throat, becoming obsolete on the body.

The largest specimen, obtained by me in the Kulu valley, measured 34 inches. All specimens which I examined had only 21 series of scales. One nearly full grown, from the neighbourhood of Kotegurh (N. E. of Simla) measures 25¼, of which the tail is 3¼, terminating with a very small single, subconical scale; ventrals 160, subcaudals 42.

The species is very common all over the N. W. Himalayas, especially between 5 and 8000 feet, but on the Hatú mountain near Kotegurh and about Serahan I observed it even as high as 10·000 feet. It principally feeds on mice.

Fam. VIPERIDÆ.

83. *Daboia Russellii*, S h a w, (G ü n t h., l. cit. p. 396).

This species is in the southern portion of the Kulu valley almost quite as common as the last, but it does not seem to grow to as

large a size, as in Bengal or the plains of India; the largest Himalayan specimen I measured was only 32 inches. The coloration and other characters are, however, very constant, there are dark brown oval spots encircled with black and then with white; the tail in young specimens is brown above, yellow below.

I observed the species up to 5000 feet in Kulu, and up to 6000 feet in Kashmir, but its usual habitat is between 2 and 4,000 feet. It is generally found in sunny places near the foot-paths, while *Halys himalayanus* is met with on the path itself, generally after rain, and in shady places between overhanging forest trees.

CHELONIA.

Of this class I have obtained, along the Burmese and Malayan coast, only very few species, and those do not, with a single exception, call for any special remark.

84. *Emys crassicollis*, B e l l, (G ü n t h., l. cit. p. 28).

I found this species common in the small fresh water streams of Penang.

The coloration during life is blackish brown with a slight greenish tinge on the carpace and on the feet, sometimes the lower side is irregularly marbled with a paler color. The head has in young specimens a small interrupted pale orange or whitish spot somewhat in front above each eye, a pale large spot on each side of the neck, two spots behind the angle of the mouth and the greater posterior portion of the lower jaws are also whitish. In full grown specimens, the pale spots become indistinct and more or less confluent. It does not appear to be generally known that in the adult (8 inches long) turtle the *costal ridges** which are very distinct in young specimens often perfectly disappear, and the vertebral ridge also becomes indistinct, as observed by Dr. C a n t o r (Journal Asiatic Society, Bengal, 1847, XVI, p. 609). The last vertebral plate is in younger

* Dr. J. E. G r a y quite lately (Proc. Zool. Soc., Lond. 1869, p. 197) proposed for *Emys crassicollis* (apparently as the type) a new generic name *Bellia*. In the generic characteristic the author states "back three-keeled." It is perhaps fortunate that Dr. G r a y had not the carpace of an adult *crassicollis* with a detached skull for examination; he would certainly have made of it a new species, and under favorable circumstances perhaps a new genus! In the old turtle as compared with the young, the snout is more obtuse, the webbing of the feet a little less distinct, and the plates on the upper side of the feet more subdivided into single shields.

specimens sometimes as broad as the caudals, sometimes the caudals reach only on one or the other side beyond its angle.

Explanation of Plates.

Pl. X.

Fig. 1. *Cyrtodactylus affinis*, n. sp., p. 167 ; 1 upper view ; 1 a, side view, and 1 b, lower view of the head ; 1 c, femoral region with a portion of the tail ; all figures in natural size ; from Penang hill, 2,400 feet.

Fig. 2. *Riopa lineolata*, n. sp., p. 175 ; side view of the entire specimen in natural size, 2 a, b, c, top and lower views of the head and inner femoral region, enlarged ; Martaban, near Moulmein.

Fig. 3. *Tiliqua rugifera*, n. sp., p. 170 ; corresponding figures as in the last species, natural size ; Nicobars.

Fig. 4. *Mabouya Jerdoniana*, n. sp., p. 172; same views as of the last species, all in natural size ; Pulo-Tickus, near Penang.

Pl. XI. (All figures in natural size).

Fig. 1. *Ablabes Nicobariensis*, n. sp., p. 184 ; upper, lower and side views of the anterior part of the body ; Nicobars.

Fig. 2. *Compsosoma semifasciatum*, Blyth, p. 188 ; same views as of the last ; Subthoo, N. W. Himalaya.

Fig. 3. *Tetragonosoma effrene*, Cantor, p. 203 ; upper and side views ; Banka island.

Fig. 4. *Dipsas hexagonotus*, Blyth, p. 198 ; upper, lower and side views ; from the Andaman Islands.

Fig. 5. *Cantoria Dayana*, n. sp., p. 208 ; same views as of the last ; Amherst, Tenasserim Province.

Fig. 6. *Dipsas multifasciata*, Blyth, p. 199 ; upper and side views ; from near Simla, N. W. Himalaya.

Fig. 7. *Ophiophagus elaps*, Schleg., p. 210 ; upper view of a young specimen ; from near Moulmein.

Pl. XII. (All figures in natural size).

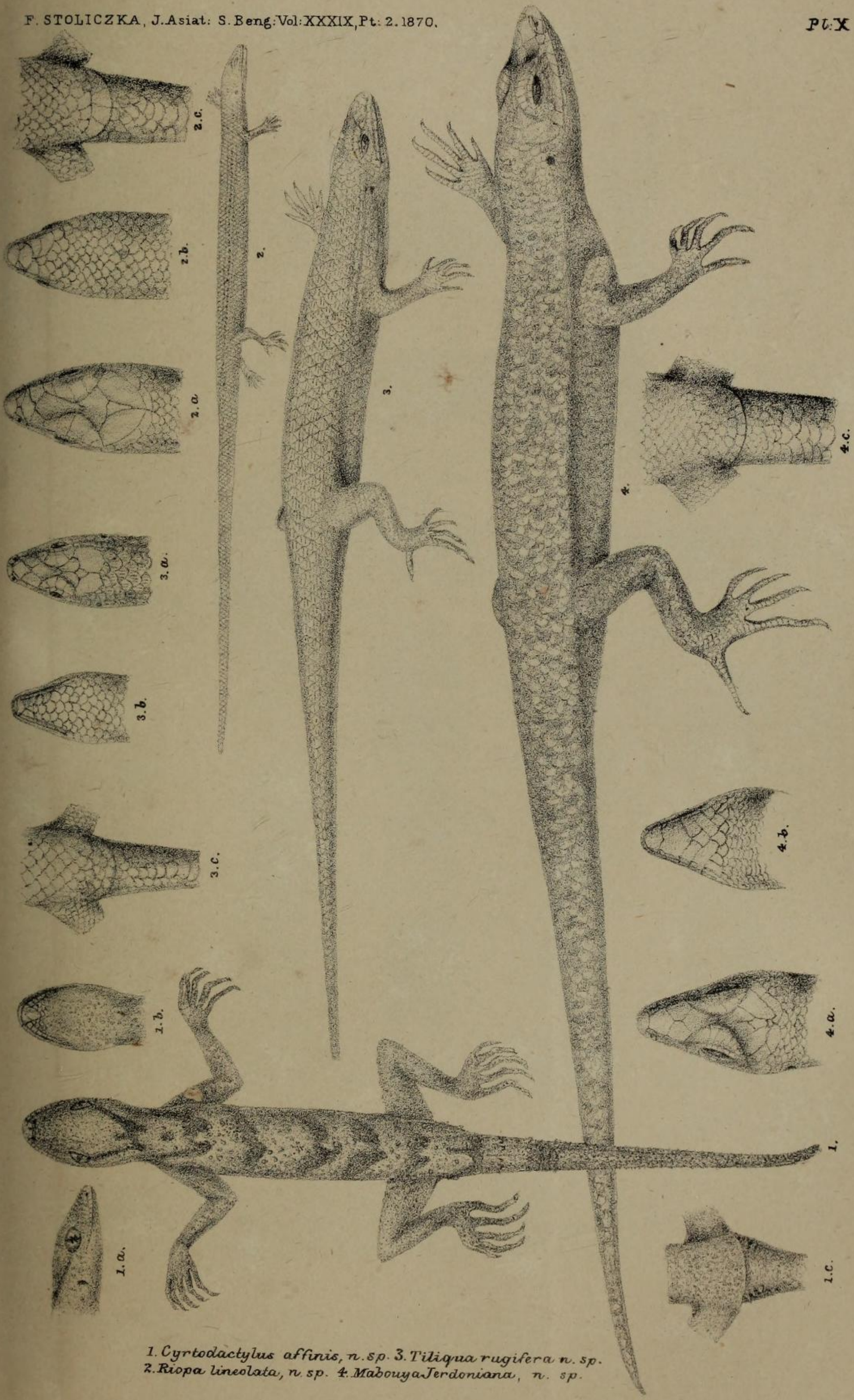
Fig. 1. *Trimeresurus convictus*, n. sp., p. 224 ; side and upper views of the head and neck, 1 b, side view of the middle portion of the body ; Penang.

Fig. 2. *T.——— porphyraceus*, Blyth, p. 218 ; similar views as of the last ; Andaman islands.

Fig. 3. *T.——— Cantoris*, Blyth, p. 222 ; same views as of the last, uniform green variety from the Nicobars.

Fig. 4. *T.——— Cantoris*, Blyth, p. 222 ; side and upper views of one of the largest specimens ; Nicobars.

Fig. 5. *T.——— mutabilis*, n. sp., p. 219 ; 5 and 5 a, the two sides of head and neck of the same specimen, shewing the second labial divided in one and united in the other ; 5 b upper view of the fore part of the body, 5 c side view of the middle part of the body, 5 d upper view of the same, 5 e, side view of the middle part of the body of another specimen, shewing a slight difference in coloration ; Nicobars.



1. *Cyrtodactylus affinis, n. sp.* 3. *Tiliqua rugifera n. sp.*
2. *Riopa lineolata, n. sp.* 4. *Mabouya Jerdoniana, n. sp.*

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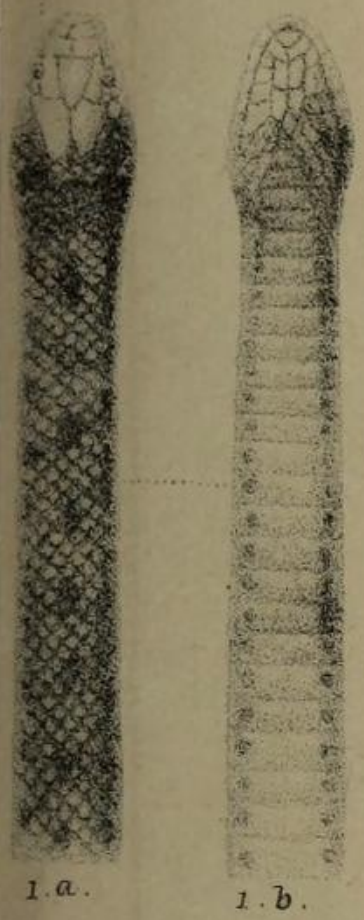

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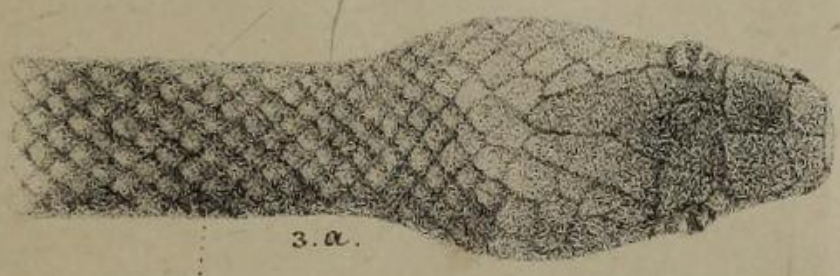

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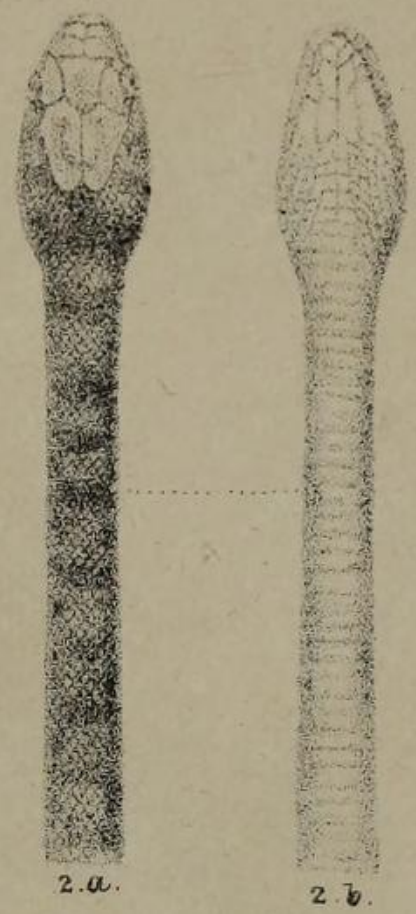

2.a. 2.b.

6.a.

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4.a.

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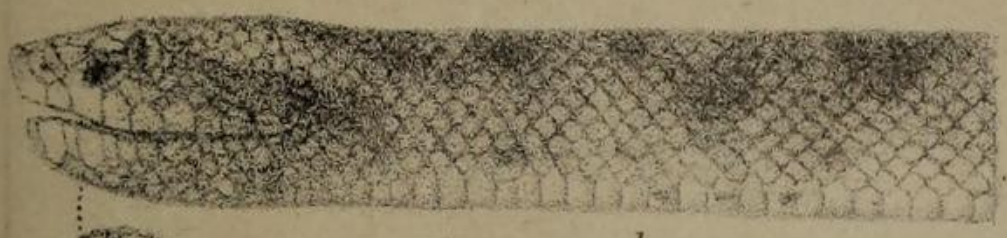
5.a.

5.b.

6.

1. *Ablabes Nicobariensis, n. sp.*
2. *Compsosoma semifaciatum, Blyth.*
3 *Tetragonosoma effrene, Cant:*
4. *Dipsas hexdgonotus Blyth.*
5 *Cantoria, Dayana, n. sp.*
6. *Dipsas multifasciata, Blyth.*
7. *Ophiophagus elaps, Schlegel*



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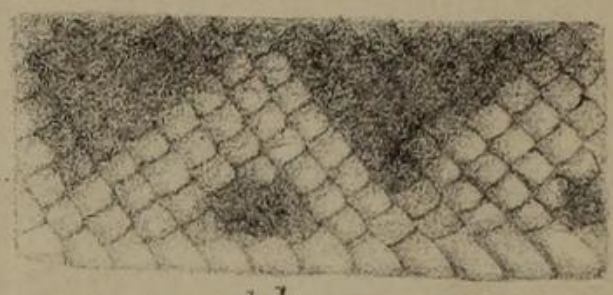

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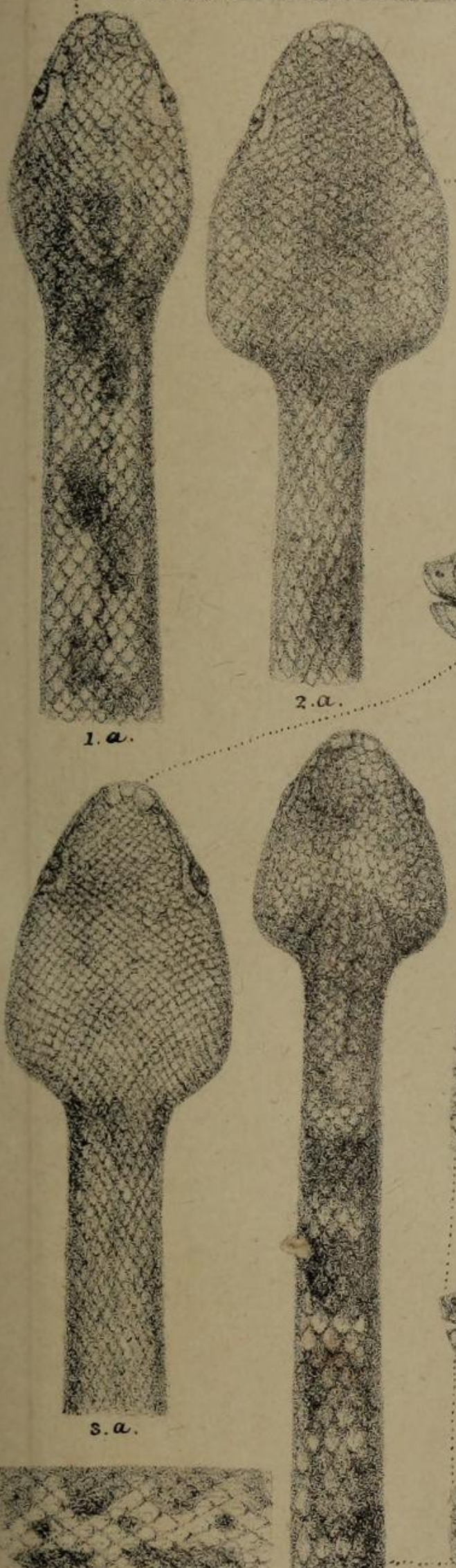

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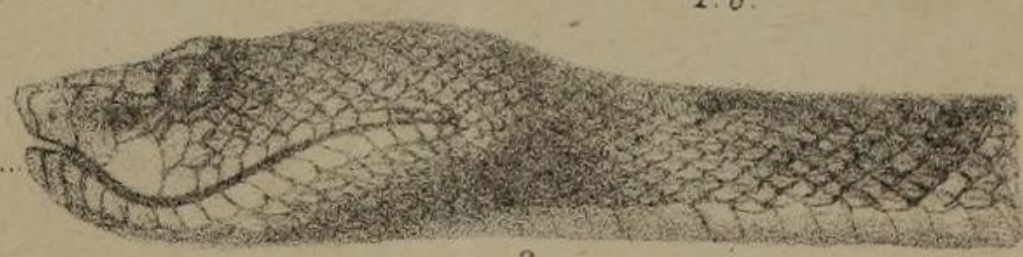

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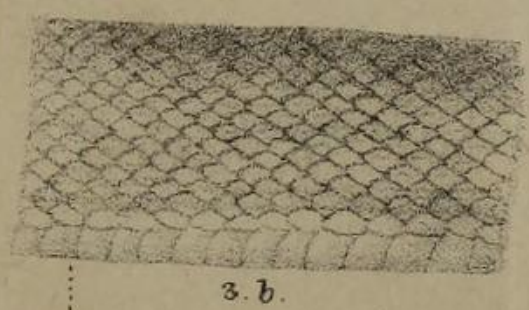

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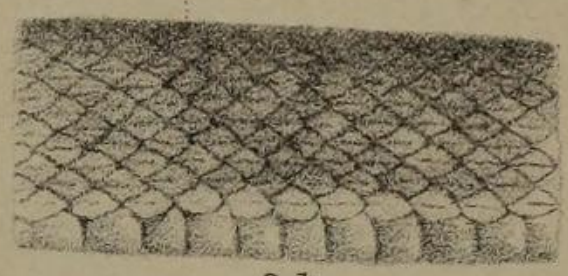

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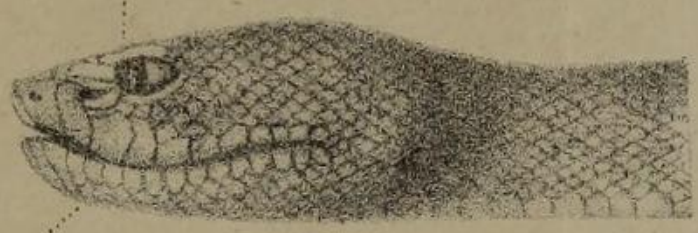

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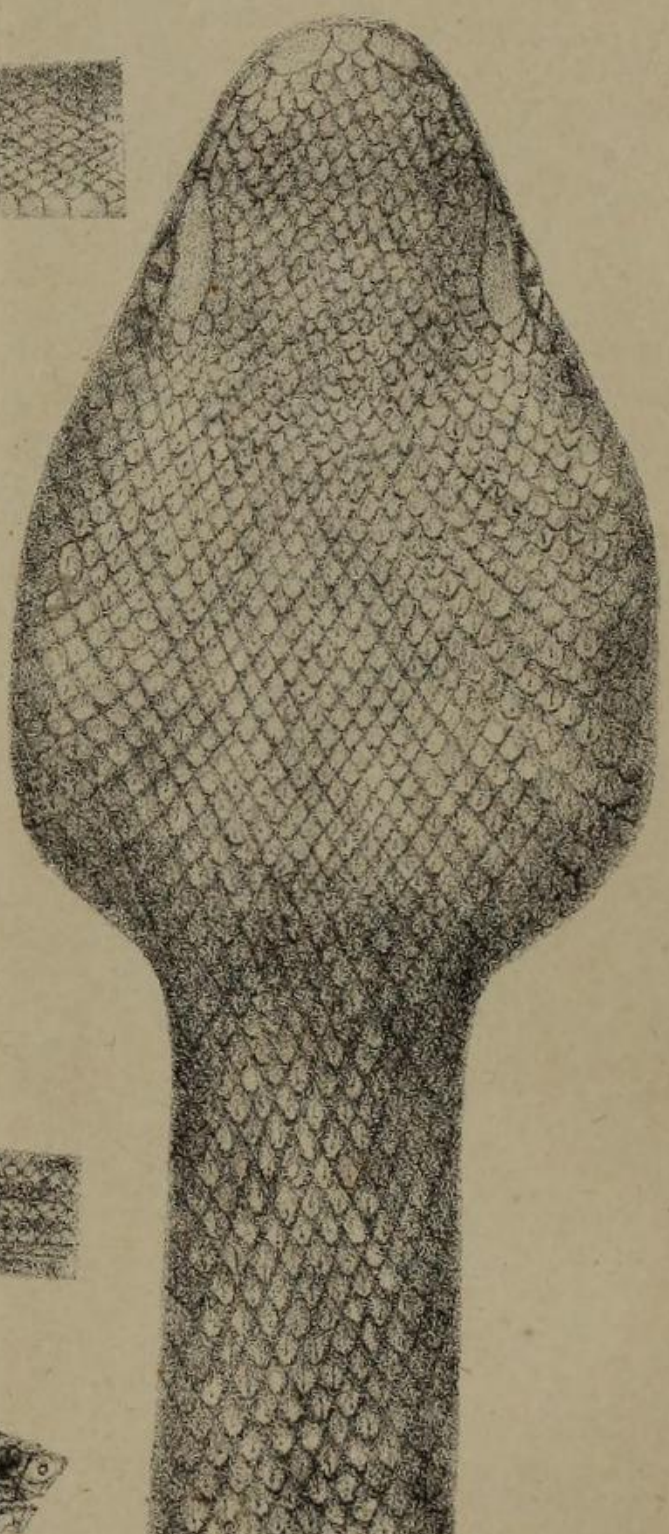

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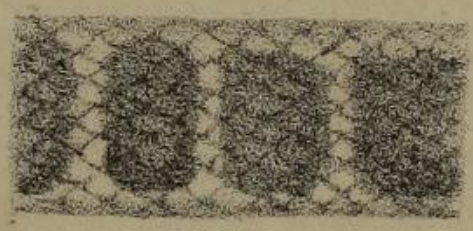

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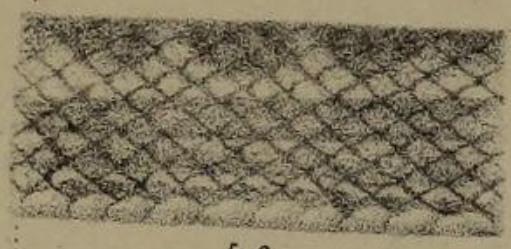

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5.a.

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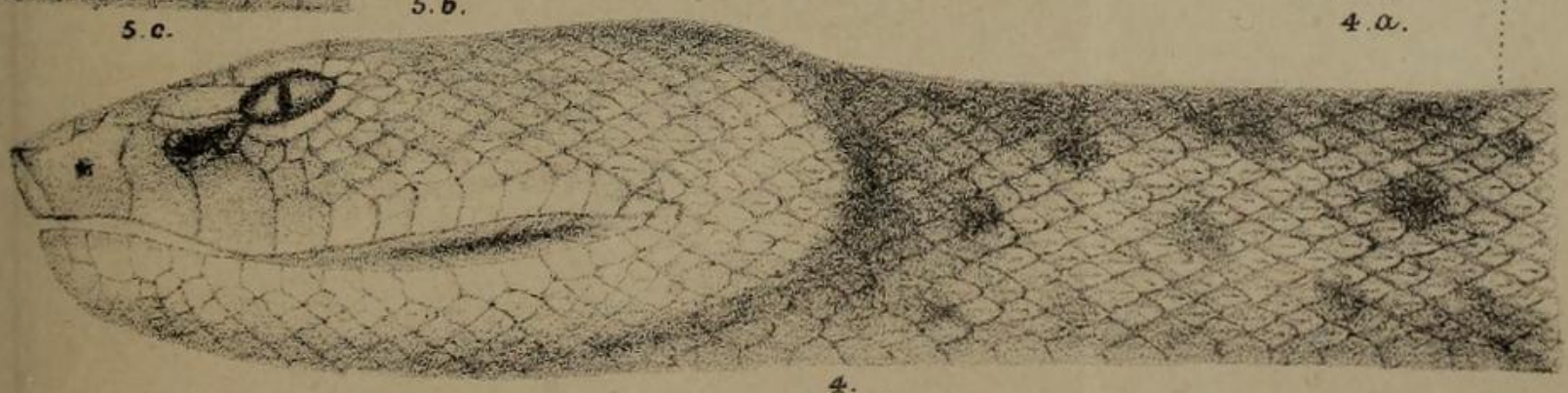

4.

1. *Trimeresurus convictus, n sp.*
2. *" porphyraceus, Blyth.*
3-4. *Trim. Cantoris, Blyth.*
5. *" mutabilis, n. sp.*