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THE
SARAWAK MUSEUM
JOURNAL

EDITED BY
E. BANKS, B.A.
Curator of the Sarawak Museum.

*For the Promotion of Scientific Knowledge and Study of
the Natives and Natural History of the Island of Borneo.*

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Volume III.

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I.—An Apparently New Race of Flower-pecker from Borneo. By EINAR LÖNNBERG.

In December 1923 Dr. E. Mjöberg collected on his way back from Mt. Murud at Rumah Tamabo Perak in the Kalabit country, N. Sarawak, a Flower-pecker which he kindly has sent to me for identification. When dissecting the bird Dr. Mjöberg observed that the testicles were "enormously developed," so that there could be no mistake about its being a male. Considering this it was apparent that it belonged to the plain-coloured *minullum*-group, as the length of its wing was only 45 mm.

Upper parts of the head dark olive-brown with comparatively broad olive-green edges to the feathers, so that thus each feather shows a dark central disk and a green margin. Remaining upper parts olive-green, more greyish on nape and neck, more strongly green on the back and finally inclining to olive-yellow on the lower rump and upper tail coverts. Wing coverts edged like the back, the quills with more olive-yellow outer margins, better developed on the secondaries than on the primaries, on which the light margin is quite narrow and even absent on the outermost one. Tail almost black, obsoletely tipped with brownish-white. Lores and sides of head grey with a slight olive tinge. Throat and fore neck ashy-grey. Centre of breast and belly creamy-whitish, sides of body and flanks pale olive-green, vent and lower tail coverts sulphur-yellow, strongly contrasting both with flanks and belly. Under wing-coverts and axillaries silky-white with a hardly perceptible tinge of sulphur-yellow on the outer ones. Culmen not quite 8 mm. Tail 22 mm.

If now a comparison is made with the other plain-coloured races, two, viz., *concolor* Jerdon and *obscurum* Ogilvie Grant, may be discarded at once in consequence of their much larger size.

D. m. sollicitans Hartert from Java has a buff patch on the lores, and *D. m. subflavum* Stuart Baker from Belgaum

(Bombay Presidency) has forehead and lores white, *olivaceum* Walden, recorded from E. Himalayas to Malacca and Sumatra, has the throat yellowish-white like the under surface of the body, not ashy-grey. The same is said to be the case with *minullum* Swinhoe from Hainan, while *everetti* Tweeddale from the Philippine archipelago has the under tail-coverts of the same "pale olive-greenish" tint as the flanks, etc. The race on the Andaman Islands, *virescens* Hume, has "the abdomen, flanks and sides of body olive-yellow, under tail-coverts white."

The races *everetti*, *virescens*, *olivaceum*, and *subflavum* appear also to have a greater length of wing, while it seems to be smaller in *minullum*.

The race *D. m. uchidai* described by Kuroda from Formosa is unfortunately not known to me, but it appears improbable that it is identical with the bird from Borneo, and in such a case it is very likely, that the latter represents an endemic race, which may be named *Dicaeum minullum borneanum* to indicate its origin.

Dr. Mjöberg is thus to be congratulated on the discovery of this hitherto missing link in the chain of geographic races of the plain-coloured Flower-peckers, so widely distributed in the Oriental region.

II.—On a peculiar form of Flycatcher from Sarawak, Borneo. By ERNEST HARTERT.

On Mount Poi (also called Poe) to the west of the town of Kuching Dr. E. Mjöberg collected a pair of Flycatchers, which offer an interesting puzzle.

They are adult birds and were shot in October at elevations of 5200 and 5300 feet. The male agrees with the males of *Dendrobiastes hyperythrus pallidipectus* (Hart.) from the island of Batjan; at least I cannot see a difference, though possibly some slight difference might become obvious if a series could be compared. The female, however, is on the upside blue-grey, while the females of *D. h. pallidipectus* are brown. The female from Mount Poi is very much like that of *D. h. alifurus* Stres. from Buru, but the throat and breast are lighter, not so brownish; there is more white on the abdomen, and the upside is slightly paler blue-grey. The male of *D. h. malayana* is much darker on the underside, and the female has a brownish upside. This Flycatcher was previously found on Mt. Poi by the late Alfred Everett, and there is a young bird in the Tring Museum. I propose to call the Poi subspecies:—

DENDROBIASTES HYPERYTHRUS mjobergi subsp. nov.

Type female ad. Mt. Poi 5300 feet, 30th September, 1923, in the Sarawak Museum.

The occurrence on Mt. Poi of a different form is very interesting, as *D. hyperythrus malayanus* (Ogilvie Grant) is common on Kinabalu; the range of this latter extends from Sumatra and the Malay Peninsula to S. Celebes (Bonthain Peak), but specimens from the latter locality have as a rule longer wings, male 63-65.5, female 60, 61 mm. while in *malayana* from other islands they are in the males only exceptionally longer than 61, mostly under 60, females under 60 mm. A better series from S. Celebes must, however, be compared, to confirm these differences.

[The above birds were submitted to me by Dr. Mjöberg, but having no material for comparison I sent them to Dr. Hartert. Subsequently Dr. Mjöberg sent me three more specimens, all males, taken at the same place in October and November. Two of them resemble the male paratype, but in the third the apex of the pale area of the foreneck, or throat, is partly white. This, together with the colour of the female, seems to indicate that this race may belong to the same section of the subspecies of *D. hyperythrus* as *Dendrobiastes (Muscicapula) nigrorum* (Whitehead) from Canloan Volcano, 6000 feet, Negros, Philippine Islands (which I know from the original description only). The wings of these three males measure 60, 61, 63 mm.—C Boden Kloss].

III.—On a Collection of Reptiles and Amphibians from Mt. Murud, Borneo. By
MALCOLM A. SMITH, F.Z.S.

(With one plate.)

The collection of reptiles and amphibians made by Dr. Mjöberg is a valuable contribution to the mountain fauna of Borneo. Although only 14 species were obtained, no less than five of them appear new to science. All were caught at high altitudes—between 5500 and 7000 feet.

The discovery of a new lizard allied to *Phoxophrys* is of particular note, whilst an interesting adaptation to environment was met with in respect to the breeding habits of a new tree-frog of the genus *Philautus*. I am also, thanks to a large series of specimens, able to give the true status of the frog originally described by Boulenger as *Microhyla leucostigma*.

The types of the new species here described have been presented by the Sarawak Museum to the British Museum.

SNAKES.

1. *NATRIX MURUDENSIS* sp. nov.

Type female, author's number 7210 collected at 5500—6000 feet altitude.

Description of the type. Maxillary teeth 23, the last 2 abruptly enlarged. Eye moderate. Rostral broader than high, just visible above; internasals as long as the praefrontals, broadly truncate anteriorly; frontal nearly as broad as long, as long as its distance from the rostral, much shorter than the parietals; nostril in a partly divided nasal; loreal longer than high; 1 prae- and 3 postoculars; temporals 1+2; 9 supralabials, fourth to sixth touching the eye; 11 lower labials, 6 in contact with the anterior chin-shields, which are a little longer than the posterior.

Sar. Mus. Journ., No. 8, 1925.

Scales in 19 rows, reducing to 15 before the vent, all strongly keeled except those of the outer row which are only feebly keeled. Ventrals 179, anal divided, subcaudals 63 pairs (tail incomplete).

Colour. Dark olive brown above with a chain of small yellow spots down either side of the back in the posterior two-thirds of the body; neck with reddish and black markings; upper lip, chin and throat yellow; belly greyish-yellow, with longitudinal chains of small black spots; tail below dark grey.

A second female (No. 7209) captured at 7000 feet has the internasals slightly shorter than the praefrontals, a slightly narrower frontal, and on the left side 2 praeocular shields; ventrals 176, caudals 83. The ventral spots are confined to a chain on either side of the belly.

Natrix murudensis is closely related to *N. chrysarga* Schlegel from which it differs in the fewer number of maxillary teeth and in having only a single anterior temporal shield. *N. chrysarga* is a common and widely distributed snake ranging from the E. Himalayas and S. China to the Malay Archipelago, and as far as I am aware two anterior temporals is a constant character. The number of teeth in the maxillary bone in continental specimens varies from 33 to 37, not counting the two enlarged posterior teeth. I have not examined the dentition of any from the Malay Archipelago.

2. *NATRIX SARAWACENSIS* Gunther.

Tropidonotus sarawacensis, De Rooij, Rept. Indo-Austr. Archipel., ii, 1917, p. 85.

One example from near the top of the mountain.

LIZARDS.

3. *GYMNODACTYLUS BALUENSIS* Mocq.

De Rooij, Rept. Indo-Austr. Archipel., 1915, p. 14.

Three specimens were collected at between 4500 and 6000 feet. One is an adult male measuring 94 mm. from snout to vent. It has an angular series of 9 praeanal pores and 9 femoral pores on either side, with 9 and 10 upper and 8 and 10 lower labials. The other two examples are half grown and in them the femoral scales bear pits only.

The juveniles are coloured light brown above with black spots forming irregular cross-bars. The adult is pale grey in colour and has the markings much paler.

4. GONOCEPHALUS MJÖBERGI sp. nov. Pl. fig. 2.

Type female, author's number 7211, collected at 7000 feet altitude:

Description. Snout longer than the orbit; canthus rostralis sharp; supraciliary border not strongly raised; tympanum as large as the eye opening; nostril in a single large scale; upper head shields moderate in size, irregular, feebly keeled; a horizontal ridge composed of one or two keeled scales above and in front of the tympanum; 8 and 9 upper and 8 lower labials; a series of 5 or 6 large flat scales parallel to the infralabials and separated from them by two rows of smaller scales; a single, enlarged, flat scale, two-thirds the size of the tympanum, and just below it; gular sac small (the tip missing), with feebly serrated edge, covered with small, smooth scales.

Nuchal crest formed of 11 lanceolate scales, the anterior small, the longest equal to the diameter of the eye; dorsal crest a mere ridge, not continuous with the nuchal. Dorsal scales small, feebly keeled, their points directed upwards and backwards and intermixed with larger scales arranged in oblique series; ventral scales larger than the dorsals, keeled.

Tail compressed, 3 times as long as the head and body, covered with large, feebly keeled scales above and 4 rows of larger, more strongly keeled scales, below. Limbs with moderately large, keeled scales; the fore-limb pressed backwards along the body reaches the vent; the hind-limb pressed forwards reaches to just beyond the eye; third and fourth fingers equal, fourth toe a little longer than third.

Colour: Greyish-blue (grass-green in life) above, paler below.

From snout to vent 88 mm.; tail 265; fore-limb 57; hind-limb 76.

Allied to *G. dilophus* (Dum. & Bib.) and *G. grandis* (Gray).

5. PHOXOPHRYS SPINICEPS sp. nov. Pl. fig. 1.

Type female, author's number 7212, collected at about 6000 feet altitude.

Description. Snout short, shorter than the length of the orbit; canthus rostralis with raised edge; upper head scales moderate in size, unequal, strongly keeled, a **Λ**-shaped series on the forehead. A long spine above the eye succeeded by a much shorter one at the posterior margin of the supraciliary border; other scattered conical scales on the hinder

part of the head and a prominent spine upon the occiput; 11 upper and 11 lower labials and three or four rows of enlarged scales parallel with the latter.

An oblique fold in front of the shoulder. No nuchal crest but three well separated spines on the neck, and groups of three or four spinous scales at intervals down the middle of the back and on to the base of the tail. Upper part of the body covered with very small, smooth imbricate scales with rounded edges, intermixed with enlarged, pointed, keeled scales, all directed upwards and backwards, the larger ones arranged in more or less oblique series and conterminous with the enlarged vertebral scales; ventral scales very large and strongly keeled; gular scales much smaller, feebly keeled; limbs covered with large, irregular, keeled scales.

Tail twice the length of the head and body, compressed laterally, covered with large keeled scales, those below larger than those above. Fourth finger a little longer than third, fourth toe much longer than third, the hind-limb reaches to the tip of the snout.

Colour. Pale grey above (grey-green in life) with scattered dark brown markings; the fold in front of the shoulder black. Throat with transverse black lines; belly spotted with grey.

From snout to vent 60 mm.; tail 123; fore-limb 37; hind-limb 58.

The affinities of this interesting lizard are more with the unique *Phoxophrys tuberculata* Hubrecht than with *Japalura*, and I have therefore placed it in the former genus.

The single example was captured on a tree trunk. It contained two oval eggs about 12 × 7 mm.

6. SPHENOMORPHUS MURUDENSIS, sp. nov.

Type, author's number 7221, collected on the top of the mountain (7000—7200 feet).

Description of the type. Lower eyelid scaly, tympanum large, two-thirds the size of the eye-opening, no lobules; snout rounded, no supranasals, nostril in a single shield; rostral convex, in contact with the fronto-nasal, which is broader than long; praefrontals in contact; frontal as long as the frontoparietals and interparietal together, in contact with three supraoculars; 6 supraoculars, the last very small; 8 supraciliaries; a small shield behind the interparietal, separating

the parietals; 2 anterior and 2 posterior loreals; 6 supra-labials, the fourth below the middle of the eye; temporal shields scale-like but larger than the body scales, the largest being in contact with the parietal; no nuchals.

Distance between the axilla and groin $1\frac{2}{3}$ times the distance between the snout and fore-limb; 30 smooth scales round the middle of the body, dorsals and laterals subequal, ventrals slightly larger; praeanales enlarged. Tail $1\frac{3}{4}$ times as long as the head and body, the scales below transversely enlarged; the hind-limb nearly reaches the wrist; fourth toe much longer than third with 16 rounded lamellae beneath.

Colour. Dark brown on the back thickly spotted with black; a dark flank band of closely packed black spots on a white ground, the spots becoming thinned out as they approach the belly which is white with numerous black spots. Tail brown above, white below, thickly spotted all over with black.

From snout to vent 50 mm.; tail 89; fore-limb 13; hind-limb 19.

Allied to *S. anomalopus* Bouleng., and *S. variegatus* Peters.

Variation. A second specimen (No. 7220) taken lower upon the mountain, 5000—6300 feet, differs in that there is a small shield interposed between the praefrontals, and there are 32 scales round the body.

To this species also I refer two more specimens collected at about 6000 feet altitude (Nos. 7217 and 7218). Their limbs are slightly longer, the foot reaching to just beyond the wrist when the limbs are adpressed and their colouration is somewhat different. The back is brown, with only a few black spots upon it; there is a well defined black lateral band and the flank below it is only thinly spotted; the rest of the lower parts are pure white. The colouration of these two lizards on the whole, is in distinct contrast to that of the former two, but in the absence of differential scale characters I have placed them under the same name.

AMPHIBIANS.

7. RANA KUHLII Schleg.

Van Kampen, Amphib. Indo-Austral. Archip., 1923, p. 178.

Two examples were collected at 6000 feet.

8. PHILAUTUS PETERSI Bouleng.

Ixalus petersi Boulenger, P. Z. S. London, 1900, p. 185, fig.

Philautus petersi, Van Kampen, Amphib. Indo-Austral. Archipel., 1923, p. 276.

Ixalus castanomerus Boulenger, Journ. F.M.S. Mus. 1905, i, p. 39, fig.—id. Rept. and Batr. Malay Penin. 1912, p. 254.—Malc. Smith, Journ. F.M.S. Mus. 1922, X, p. 280.

12 examples from near the top of the mountain. *Philautus petersi* was described by Boulenger on specimens from Borneo (Mt. Penrissen, Mt. Dulit and Mt. Kinabalu) and Great Natuna. He distinguished it from *Ph. aurifasciatus* (Schlegel) by the larger and more distinct tympanum, the longer digits and duller colouration. Van Kampen in recently discussing these two forms (1923, l.c.s.) remarks that "the size of the tympanum and the colouration, however, are very variable in *Ph. aurifasciatus* and therefore the differences between the two species are very slight, if at all present. Perhaps the shape of the snout and the position of the nostrils are more valuable characters in distinguishing both species." With these remarks I fully agree. The difference between the two forms is certainly very small but with a good series of the frog from one of the type localities (Mt. Penrissen) available and some examples of *aurifasciatus* from Java, I maintain Boulenger's separation, on the following grounds:—

Ph. petersi.

Snout more pointed, canthus rostralis more prominent and convergent anteriorly towards its fellow.

Interorbital space not broader than upper eyelid.

Heel to tip of snout or beyond.

Length of head and body 40 mm.

Ph. aurifasciatus.

Snout less pointed, canthus rostralis less prominent and less convergent towards its fellow.

Interorbital space usually broader than upper eyelid.

Heel to between nostril and tip of snout.

Length of head and body 31 mm.

If, however, Boulenger is right in distinguishing the Bornean from the Javan frog, I do not concur in his separation of *Ph. castanomerus* (type locality Selangor, Malay Peninsula) from *Ph. petersi*. The only difference in the descriptions of the two species is a slight one in respect to the size of the digital discs as compared with the tympanum, while specimens in my collection from the Cameron Highlands on the Pahang-Selangor boundary agree with the Bornean examples in every particular.

The eggs of this frog are few and very large, being 5 mm. in diameter in a specimen 30 mm. from snout to vent.

9. *PHILAUTUS MJÖBERGI*, sp. nov. Pl. fig. 3.

Type, author's number 7265, collected at 7000 feet in November, 1922.

Description of the type. Choanae small, oval, partly hidden by the edge of the jaw. Head large, much broader than long, broader than the width of the body, snout rounded; eye prominent, nearly as long as the snout; canthus rostralis sharply defined; loreal region oblique, concave; nostril very near the tip of the snout; interorbital region $1\frac{1}{2}$ times as broad as the upper eyelid; tympanum indistinct, half the width of the eye, its distance from it equal to its own diameter.

Fingers long, free, but with a fine dermal fringe extending along their lateral edges to the disc; first much shorter than second which is two-thirds the length of the third; discs large, as broad as long, that of the third larger than the tympanum. Toes one-third webbed, their discs scarcely smaller than those of the fingers; subarticular tubercles moderate, an oval inner metatarsal tubercle one-third the length of the inner toe, no outer tubercle; the tibio-tarsal articulation reaches to well beyond the snout.

Skin of the upper parts quite smooth, of the throat finely, of the belly coarsely, granular; no fringe along the outer edge of the arm or leg.

Colour. Dark reddish-brown above and on the sides with blackish markings, including a) (-shaped mark in the middle of the back. Throat brown, belly dark brown with large white irregularly shaped spots. Two or three large white oval spots in the groin; limbs indistinctly barred.

Ph. mjobergi is related to *Ph. vermiculatus*, from the Malay Peninsula, from which it differs in the longer leg and shorter web to the toes and, very distinct, in colouration.

Variation. Over 50 specimens were collected, all from the higher parts of the mountain; they show the following variations. The tympanum may be only one-third the diameter of the eye, the interorbital region no broader than the upper eyelid. The tibio-tarsal articulation usually reaches to well beyond the tip of the snout, but may extend only to the tip.

Most of the specimens are coloured like the type, and one or two or more white spots in the groin or flanks are constantly present. Some individuals are greyish-brown in colour mottled with darker. Juveniles are usually paler in colouration.

Measurements of *Ph. mjobergi* in mm.

No.	7265	7297	7266
Snout to vent	30	28	23
Length of head	11	10.5	8.5
Breadth of head	14	13	11
Fore-limb	26	21	15
Hand	11	11	7.5
Hind-limb	54	50	40
Foot	14	14	11
Sex	♀	♀	♂

Many of the females collected are filled with ripe ova. These are few in number and extremely large. In one specimen, 26 mm. from snout to vent, from which I extracted 9 eggs, the vitelline sphere measures between 3 and 3.5 mm. in diameter, whilst in another female an egg which had been extruded, and preserved intact with its surrounding gelatinous envelope, measures 9.5 mm. in diameter.

Dr. Mjöberg states that these frogs were found depositing their eggs and breeding in the pitchers of the Pitcher plants (*Nepenthes*), no other water being available for the purpose. Unfortunately he obtained no larvae, and the very large size of the eggs would appear to indicate that a considerable part of the larval development, at any rate, was carried on away from water.

10. SPHENOPHYRNE LEUCOSTIGMA.

Microhyla leucostigma Boulenger, Ann. Mag. Nat. Hist., 1899, (7) iii, p. 275, fig.—idem., Fauna Malay Penin., Rept. and Batr., 1912, p. 260.—S. Flower, P. Z. S., London, 1899, p. 905.—A. L. Butler, Journ. N. H. S. Bombay, 1904, xv, p. 388.

Chaperina fusca Mocquard, Mém. Soc. Zool. France, 1892, V, p. 194, figs.—(? in part), Van Kampen, Amphib. Indo-Austr. Archip., 1923, p. 109.

Chaperina beyeri Taylor, Philippine Amphibia, 1920, p. 333, fig.

Nectophryne picturata Malc. Smith, Journ. F.M.S. Mus., 1921, x, p. 197, fig.

I have given in full what I believe to be the correct synonymy of this most interesting little amphibian, originally described from specimens obtained in the Larut hills by Stanley Flower. I have for comparison 9 specimens from Kuching, N. Borneo, 3 specimens from Mt. Murud, collected at 6000 feet, 3 specimens from the Larut hills, Perak, Malay Peninsula (one of them one of the types), 4 specimens of *Chaperina beyeri* Taylor from Jolo, Philippine Islands, sent me by the author.

I have dissected the pectoral girdle of a Kuching specimen and of one from the Larut hills; they have slender but well defined clavicles and are therefore rightly placed under *Sphenophryne* instead of *Microhyla*.

Taylor has separated his *Chaperina beyeri* from *Chaperina fusca* on the presence of a soft dermal spine on the heel and on the absence of tympanum. This latter is feebly distinct in two of the Kuching examples but is absent in all the rest. The spine is present in all 19 examples, both on the heels and elbows, and M. Angel, who has kindly examined the type specimen of *Chaperina fusca* for me, tells me that it is present also on all four limbs. It varies in size from a mere projection, hardly visible under the glass, to a fine spicule one millimetre in length; being semi-translucent it is not visible in all lights and thus has escaped notice.

As regards colouration, all the Kuching examples are coloured like the Perak specimens, a very complete description of which has been given by Flower. Those from Mt. Murud are dark purplish-black above with the small white spots almost absent on the dorsum but more numerous on the sides of the head and body. Taylor also records variations in colour for his Philippine specimens.

The occurrence of this frog in New Guinea, if V. Mehely's frog really is identical with it, is remarkable, for up till now no amphibian inhabiting that island has been found also in the Malay Peninsula.

11. NECTOPHRYNE GUENTHERI Bouleng.

Van Kampen, Amphib. Indo-Austral. Archipel., 1923, p. 68.

4 specimens from between 5500 and 7000 feet altitude.

12. *NECTOPHRYNE MISERA* Mocq.

Van Kampen, *Amphib. Indo-Austral. Archipel.*, 1923, p. 66.

Many specimens from near the top of the mountain. The largest measures 23 mm. from snout to vent.

13. *MEGALOPHRYS HASSELTII* Tschudi.

Van Kampen, *Amphib. Indo-Austral. Archipel.*, 1923, p. 13.

Two examples were collected at 6000 feet.

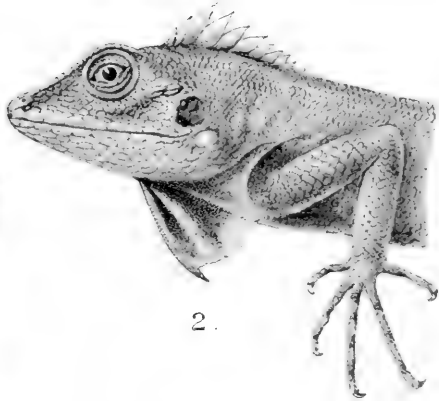
14. *MEGALOPHRYS GRACILIS* Gunther.

Van Kampen, *Amphib. Indo-Austral. Archipel.*, 1923, p. 15.

One example was collected at 7000 feet.



1.



2.



3.



3a.

J. Green del.

NEW REPTILES & BATRACHIANS FROM MT. MURUD.

- 1. *Phoxophrys spiniceps.*
- 2. *Gonocephalus mjobergi.*
- 3. *Philautus mjobergi.*



IV.—Contributions to the Herpetology of Borneo. By MALCOLM A. SMITH, F.Z.S.

I am indebted to Dr. Eric Mjöberg for the pleasure of examining the extensive collections of reptiles and amphibians made by him in the State of Sarawak during the past two years. These have been forwarded from time to time as they were obtained and the present article concerns the combined material, with the exception of one collection from Mt. Murud which has been dealt with in a previous paper (vide pp. 5--14).

Some of the districts visited by Dr. Mjöberg, notably Mt. Dulit and Mt. Penrissen, are already well known as collecting grounds, but others such as Mt. Matang, Mt. Poi and Mt. Gadin, but little known to herpetologists outside Sarawak, have been productive of much that is interesting.

Altogether some 700 specimens have been obtained, distributed over 95 species. The most noteworthy are a diminutive form of toad allied to *Megalophrys* which appears to represent a new genus, and an undescribed ground-Gecko of the genus *Gonatodes*. The collection also, in addition to containing several species which have not been previously recorded from Borneo, permits the status of many other little known species to be discussed. Where no departure from the text-book description has been met with no comment has been made, and the locality only in which the species was obtained is mentioned.

In working out this material and comparing it with another collection recently obtained by my Siamese collector in the northern part of the Malay Peninsula (Patani and Kuan Nieng near Patalung), I have been struck by the close association of the faunas of these two regions. Of the 47 species obtained by him which are common to the Malay Peninsula and the Archipelago, no less than eight are to be found, in the Archipelago, in Borneo alone.

The following species are here recorded from Borneo for the first time :—

Gymnodactylus philippinicus Steindachner.
Sphenomorphus modiglianii Boulenger.
Leilopisma butleri Boulenger.
Rana laticeps Boulenger.
Philautus longicrus Boulenger.

Three species are described as new :—

Gonatodes nigridius.
Gonatodes siamensis.
Leptobranchella mjöbergi.

One species is suppressed :—

Calamaria picteti Peracca.

The following localities are referred to with the dates when they were visited :—

Mt. Pemrissen, alt. 4500 feet, Jan.-Feb. 1924; Mt. Dulit, 3500-4000 feet, Jan.-Mar. 1923; Mt. Poi, alt. 5300 feet, Oct.-Dec. 1923; Mt. Matang, May-June 1924; Mt. Gadin, alt. 2000 feet, near Lundu, July-August, 1924; Kalabit country, 1922; Saratok, Santubong, 1924; Baram station, 1922; Lundu, 1924; Bidi, 1923; Trusan river, 1922.

SNAKES.

TYPHLOPIDAE.

1. *TYPHLOPS LINEATUS* Boie.
Mt. Poi (foot).

ILYSIIDAE.

2. *CYLINDROPHIS RUFUS* Lauren.
Kuching; Baram station; Mt. Gadin.

XENOPELTIDAE.

3. *XENOPELTIS UNICOLOR* Reinw.
Kuching.

COLUBRIDAE.

COLUBRINAE.

4. *NATRIX CHRYSARGA* Schleg.
Mt. Dulit; Mt. Gadin.
5. *NATRIX MACULATA* Edeling.
Lundu; Baram station.
6. *NATRIX SARAWACENSIS* Günth.
Mt. Poi, 3000 feet; Mt. Penrissen, 2000 and 4500
feet; Mt. Gadin.
7. *NATRIX PETERSI* Bouleng.
Kuching; Mt. Gadin.
8. *NATRIX TRIANGULIGERA* Boie.
Lundu.
9. *NATRIX CONSPICILLATA* Günth.
Mt. Gadin.
10. *NATRIX FLAVIFRONS* Bouleng.
2 females from Mt. Gadin. Ventrals 145, 148; caudals
96, 98.
11. *MACROPISTHODON RHODOMELAS* Boie.
Mt. Gadin.
12. *DENDROPHIS PICTUS* Gmel.
Kuching.
13. *DENDRALAPHIS CAUDOLINEATUS* Gray.
Kuching; Baram station; Mt. Gadin.
14. *XENALAPHIS HEXAGONATUS* Cantor.
Baram station.
15. *COLUBER MELANURUS* Schleg.
Kuching.

16. *HOLARCHUS OCTOLINEATUS* Schneid.
Baram station; Kuching; Mt. Gadin.
17. *GONGLYOSOMA** *BALIODIRA* Boie.
Mt. Penrissen, 2000 feet; Lundu.

18. *GONGLYOSOMA LONGICAUDA* Peters.

Ablabes longicaudus, Bouleng., Cat. Sn. Brit. Mus., ii, 1894, p. 284.—
De Rooy, Rept. Indo-Austr. Archipel. ii, 1917, p. 140.

3 examples from Mt. Gadin.

	ventrals	111,	caudals	17 (incompl.)
♂	„	128,	„	23 „
♀	„	124,	„	73 „

Colour in alcohol. Rich brownish-black above with three salmon-pink longitudinal lines lost on the posterior part of the body; the vertebral one commencing from one to two centimetres behind the yellowish chevron-shaped collar, the outer ones on the inner two-thirds of scale-row 3 and outer one-third of row 4. First or first and second scale-rows salmon-pink merging into buff on the ventrals. Eye bordered with black this colour extending downwards as a broad bar on to the infralabials.

These markings correspond very closely with those given by Boulenger and differ distinctly from those given by De Rooy (*loc. cit. sup.*).

19. *CALAMARIA VERMIFORMIS* Dum. et Bib.
Kuching.

20. *CALAMARIA BORNEENSIS* Bleeker.
3 specimens from Mt. Gadin.

2	♂	ventrals	166, 168;	caudals	23, 21.
	♀	„	187,	„	18.

Dark greyish-brown above and on the sides the colour extending to the outer edge of the ventrals, with a whitish lateral line on the adjacent edges of scale-rows 2 and 3; sides of neck and tail, and ventrals (except the outer edge) yellowish-white.

*Stejneger has recently shown that the generic name of *Ablabes* is untenable. (Medd. Zool. Mus. Kristiana, 1912, No. 2, p. 2.)

21. CALAMARIA SEMIANNULATA Bottger.

De Rooy., Rept. Indo-Austr. Archipel., ii, 1917, p. 172.

One ♀, Kuching.

Rostral as broad as high; six supralabials, the fifth the largest; anterior sublinguals a little longer than the posterior; ventrals 167, caudals 23. Light brown above with 23 large blackish transverse spots: between these, mostly along the sides of the body are smaller spots and in addition each scale is heavily edged with black. Head dark olive with blackish and yellow markings; tail above almost entirely black. Below yellowish.

This specimen combines the scale characters of *C. semiannulata* and *C. picteti* Peracca, thus confirming the view advanced by Boulenger that the two should be united; the black edging to the dorsal scales moreover suggests the possibility of a colour form in which the scales, instead of being merely edged, are entirely black. The specimen would then, except in the proportions of the rostral shield, entirely accord with *C. leucocephala* Dum. and Bib. I strongly suspect that this latter name will have ultimately to be adopted for both *C. semiannulata* and *C. picteti*.

HOMALOPSINAE.

22. HURRIA RYNCHOPS Schneid.

Kuching; Seratok.

23. FORDONIA LEUCOBALIA Schleg.

Seratok.

BOIGINAE.

24. PSAMMODYNASTES PULVERULENTUS Boie.

Mt. Penrissen, 4000 feet; Mt. Gadin.

25. CHRYSOPELEA CHRYSOCHLORA Schleg.

Mt. Matang; Mt. Gadin.

26. DRYOPHIS PRASINUS Boie.

Kuching; Mt. Gadin.

ELAPINAE.

27. *DOLIOPHIS INTESTINALIS* Laurenti.
Colour var. *intestinalis*. Lio Matu, Baram station.
28. *AMBLYCEPHALUS LAEVIS* Boie.
2 ♂, Mt. Penrissen, 4000 feet.
No. 7861, ventrals 196, caudals 73;
No. 7862, ventrals 196, caudals 78.

Number 7862 has seven supralabials and a small shield on either side interposed between the internasal and loreal shields. Both examples show a considerable increase in both the ventral and caudal count over what has been previously recorded.

VIPERIDAE.

29. *TRIMERESURUS PUNICEUS* Boie.
Kuching; Lundu; Mt. Gadin.
30. *TRIMERESURUS GRAMINEUS* Shaw.
Kuching; Mt. Penrissen, 4000 feet; Mt. Gadin.

LIZARDS.

GECKONIDAE.

31. *GYMNODACTYLUS MARMORATUS* Kuhl.
Saratok.
32. *GYMNODACTYLUS PHILIPPINICUS* Steind.
Taylor, Lizards of the Philippine Is., 1922, p. 47, fig. 8.

One female, adult, Tutu river, Kalabit country (No. 7216); one juvenile, Mt. Poi (No. 7666).

In the absence of a male specimen I refer these two Ground-Geckoes to *G. philippinicus*. I have compared the adult with a male from Mt. Irid, Luzon, kindly sent me by Mr. E. H.

Taylor, and find it differs in the following particulars:—The ventral scales are slightly larger—about 45 across the belly instead of 60—and the scales bordering the pubic groove are not any larger than those on the adjacent surface of the thighs. In the Philippine example there is a marked difference in the size of these scales.

The Mt. Poi juvenile agrees with the above except in colouration. In this specimen, which is about one-third grown, the back is dark grey, with large irregularly disposed black spots, which could not, with any form of coalescence, be said to form bands. There is a black V-shaped mark on the nape, its apex at the shoulders, and the tail is alternately banded with black and grey.

33. GYMNODACTYLUS CONSOBRINUS Peters.

Mt. Gadin.

34. GONATODES KENDALLII Gray.

3 ♂ from Mt. Gadin.

The canthal ridges are well marked and extend backwards above the eyes; the back is covered with small granules intermixed with larger scattered tubercles arranged in from 10 to 12 fairly regular longitudinal rows; there are no preanal or femoral pores nor enlarged scales that might bear them; the tail is covered on the sides and above with whorls of long pointed tubercles and has below a median series of enlarged, keeled, pointed, partially erect scales so that when viewed from the side they look like the teeth of a saw; a pair of large chin-shields are in contact with one another behind the mental or separated by a small scale. The colour in alcohol is brown above and on the sides with lighter variegations; below yellowish.

The type of *G. kendallii* was collected by Sir E. Belcher in Borneo. Its exact locality is not specified but it is fair to assume that it was obtained somewhere in the State of Sarawak. It is known also from the Malay Peninsula and has been recorded by me from the Nakon Sritamarat mountains, Peninsular Siam. (Journ. N. H. S. Siam, 1916, ii, p. 151.) With undoubted examples of *G. kendallii* before me for comparison, however, I now consider the Siamese form as distinct and propose for it the name *Gonatodes siamensis*. It differs in having

no canthal ridges, in having a median row of enlarged and pointed but not erect scales beneath the tail, in the male having a series of from 2 to 8 preanal pores, which may, however, be absent altogether, and in the much smaller size—head and body 42, tail 53 mm. Type, author's number 2337 collected at Maprit, near Patiyu, Peninsular Siam in 1916. Colour brownish-green, finely mottled with lighter and darker shades.

I have also examined specimens of this new Gecko from Puket, Krabi and Tasan in Peninsular Siam, from Pak Chan in southern Tenasserim, and from Khao Sebab, near Chantabun in S. E. Siam. The type has been presented to the British Museum of Natural History.

35. *GONATODES NIGRIDIVS*, sp. nov.

Type adult male, author's number 8059, collected on Mt. Gadin in May 1923.

Description of type. Head oval; snout broad and rounded, depressed, longer than the distance between the eye and ear opening. Eye large; ear opening vertically oval, its greatest diameter about half the diameter of the eye. Rostral large, quadrangular, broader than long, with deep median cleft; nostril in contact with the rostral, an internasal and 6 or 7 small granules; 13 or 14 upper labials and 10 or 11 lower; mental very large, subtriangular; a pair of chin-shields well separated from each other by the mental.

Head covered with minute granules, smallest on the occiput; back and sides of body covered with a mixture of small granules and large keeled tubercles, the large tubercles being very numerous and irregularly placed; throat with flattish keeled granules; belly and limbs with small, keeled, feebly imbricate scales; tail with small scales and whorls of pointed tubercles above and on the sides, below with a median series of flat, enlarged scales with rounded free edges; 14 preanal pores in an obtuse angled series, a single scale at the apex of the V not being perforated.

Limbs moderately long and slender, the hind-limb reaches the neck; digits long and slender, compressed, with small lamellae inferiorly and a large rounded plate at the articulation of the basal and proximal phalanx.

Rich brown above, with narrow, pale (in one example noted by Dr. Mjöberg in life bright green) cross-bars extending on either side from an ill-defined light vertebral line; a blackish

band on either side of the head from behind the eye curving on to the nape and bordered with white below, followed by two pairs of elongated blackish spots on the shoulders and less defined ones on the back; belly brownish; tail with alternate bands of light and dark colour.

From snout to vent 75 mm., tail 93; fore-limb 31; hind-limb 42.

Variation. Nine males and three females from the type locality (Nos. 8054 to 8066 inclusive); one male and two juveniles from Mt. Poi, at the foot and at 4000 feet (Nos. 7661, 7662, 7667) and one female from Lundu (No. 7659) show the following variations:—

The preanal pores in the males vary in number from 10 to 16; in the females there is an angular series of enlarged preanal scales, pitted but not perforated; in some examples the hind-limb reaches as far as the tympanum; some are almost black in colour with the markings very indistinct, in fact the general impression given by the series when taken out of spirit and laid on the table is blackish with faint pale markings.

Through the kindness of Mr. C. Boden Kloss, Director of Raffles Museum, Singapore, I have been able to examine all the specimens of *Gonatodes* in that Institution. The series includes examples of *G. kendallii* from Kuching, Sarawak, from Bukit Timah, Singapore, and from Great Natunas, and five specimens of *G. affinis* from Penang (topotypes) and Maxwell's Hill, Perak. To this latter species I now refer the specimen from Fraser's Hill recorded by me as *G. kendallii* in Journ. F. M. S. Mus., 1922, x, p. 268.

With this abundant material for comparison I have drawn up the following key which will serve to distinguish these four closely allied forms:—

1. Base of raised portion of digits with transverse plates beneath; tail with a median series of enlarged scales below.

Male without preanal pores; tail with a median row of pointed semi-erect scales below; enlarged dorsal tubercles distantly placed in more or less regular rows.

Borneo and Malay Peninsula *G. kendallii*.

Male with 2 to 8 preanal pores sometimes absent altogether; tail with a median series of enlarged pointed, not erect scales below; enlarged dorsal tubercles distantly placed in more or less regular rows.

Siam. *G. siamensis*.

Male with 10 to 16 preanal pores; tail with a median series of enlarged, flat, rounded scales below; enlarged dorsal tubercles very numerous and irregularly placed.

Borneo *G. nigridius*.

2. Base of raised portion of digits with irregular small scales; tail with small keeled scales below.

Male with 3 to 8 preanal pores. Borneo and Malay Peninsula. *G. affinis*.

36. GEKKO MONARCHUS Dum et Bib.
Kuching; Mt. Gadin.

AGAMIDAE.

37. DRACO MAXIMUS Boulenger.

1 ♂, 2 ♀, Mt. Gadin.

The gular sac of the female is about as long as the distance between the eye and the end of the snout and is yellowish-white in colour.

38. DRACO FORMOSUS Boulenger.

4 ♂, Mt. Gadin.

39. DRACO VOLANS Linn.

Kuching; Mt. Gadin.

40. DRACO CORNUTUS Günth.

Kuching.

41. DRACO FIMBRIATUS Kuhl.

Kuching.

42. GONOCEPHALUS BORNEENSIS Schleg.

Mt. Poi (foot).

43. GONOCEPHALUS LIOGASTER Günth.

Santubong; Mt. Gadin.

44. GONOCEPHALUS DORIAE Peters.

One female from Mt. Gadin.

The specimen agrees in all respects with the description of *G. doriae* except that the nuchal and dorsal crests are not so high. The nuchal crest at its highest is not more than half the diameter of the orbit, and from there it gradually diminishes in size as it proceeds backwards. The sex, however, may be sufficient to account for this difference. The tympanum is about three-quarters the size of the eye opening.

In colour the lizard is greyish-blue (probably green in life) above and on the sides, with black spots and reticulations; the gular fold is black and the tail has broad black annuli; the belly is whitish.

To *G. doriae* also I refer two young specimens recently obtained by my native collector at Batang Star, Patani, in Peninsular Siam. They differ in having a series of from two to four enlarged and differentiated, slightly keeled scales, on either side of the back. In these juveniles the gular sac is marked with black streaks and there is some black mottling on the belly; the tail has indistinct dark annulations.

G. abbotti Cochran (Proc. U.S. Nat. Mus. 1923; No. 2421, p. 1) described from a female example obtained in Peninsular Siam may ultimately have to be referred to *doriae*. Its description fits my specimen well but the fact that mine came from the region where all the specimens of *G. doriae* known have been obtained, inclines me to refer it to the older name.

45. CALOTES CRISTATELLUS Kuhl.

Kuching; Baram station.

LACERTIDAE.

46. TAKYDROMUS SEXLINEATUS Daudin.

Kuching.

SCINCIDAE.

47. MABUYA RUDIS Boulenger.

3 specimens from Mt. Gadin.

Thirty scales round the middle of the body in each example. One has a fairly well marked dark brown light-edged lateral band beginning at the eye, in another it is just discernible, while in the third it is entirely absent. In this last specimen the sides of the throat are marked with dull orange.

48. *MABUYA MULTIFASCIATA* Kuhl.
Kuching.
49. *MABUYA RUGIFERA* Stoliczka.
Kuching; Baram station; Mt. Gadin.
50. *SPHENOMORPHUS SHELFORDI* Bouleng.

1 ex. Mt. Penrissen, 4000 feet. It differs from Boulenger's description in having 30 scales round the middle of the body and 27 lamellae beneath the fourth toe.

51. *SPHENOMORPHUS VARIEGATUS* Peters.
7 exs. Mt. Penrissen, 4000 feet; 2 exs. Mt. Poi, 5000 feet; 3 exs. Mt. Gadin.

In these specimens I count the number of scales-rows round the middle of the body as ranging from 40 to 44.

52. *SPHENOMORPHUS MODIGLIANII* Bouleng.
4 exs. Mt. Poi, 5000 feet.

Except that they have 34 scales round the middle of the body they agree entirely with Boulenger's description. The largest measures 60 mm., from snout to vent, with a tail of 71 mm. in length. The back is brown, spotted with black, the throat white with black spots; in other respects the colour accords with the description. This skink has been known hitherto only from the Mentawi Islands.

53. *DASIA OLIVACEA* Gray.
Kuching.
54. *DASIA VITTATA* Edeling.
Kuching.
55. *LEILOPISMA BUTLERI* Bouleng.

Lygosoma butleri Bouleng., Fauna Malay Penin., Rept. and Batr., 1912, p. 91.

Two skinks (Nos. 7874, 7875) from Mt. Poi at 5000 feet I identify with this species. They differ from Boulenger's description as follows:—The prefrontals are just separated, the

tympanum is only half as large as the eye opening, there are 10 or 11 lamellae beneath the 4th toes. Each specimen has two loreal shields, one behind the other and the temporal shields are somewhat enlarged.

The species has hitherto been known only from the type locality—the Perak hills in the Malay Peninsula.

56. *RIOPA BOWRINGII* Günth.

Kuching.

57. *TROPIDOPHORUS BECCARII* Peters.

One adult and one juvenile from Mt. Penrissen at 3000 feet. They have 32 and 34 scales round the middle of the body respectively. The flanks of the adult example are rich reddish-brown in colour with small white spots. *T. mocquardi* Boulenger, I regard as a synonym of this species (P. Z. S. London, 1923, p. 777).

58. *TROPIDOPHORUS BROOKEI* Gray.

21 examples from Mt. Matang.

Thirty-four scales round the middle of the body occurs in five examples, 30 scales in one, the rest have 32. Some have only 7 supralabials. The prefrontal shields are separated in all, as they are in the type specimen.

AMPHIBIA.

PELOBATIDAE.

59. *MEGALOPHRYS GRACILIS* Günth.

Tutu River, Kalabit country.

Leptobrachella, genus nov.

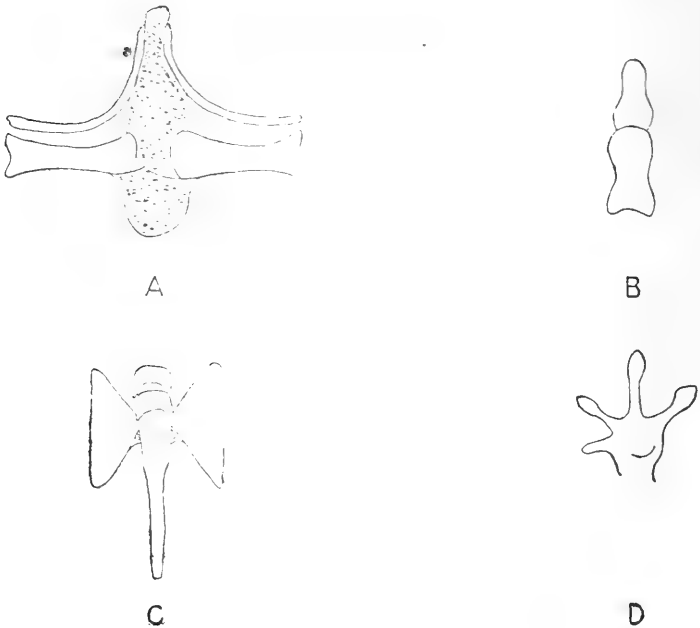
Pupil vertical,* tongue subcircular, free and notched behind. No vomerine teeth; tympanum distinct; fingers free, toes webbed at the base, the tips of the digits dilated and sub-triangular in shape; outer metatarsals united.

*In the type specimens the pupils are widely dilated, in the paratype diamond shaped, the vertical diameter being slightly greater than the horizontal.

Omosternum and sternum cartilaginous; clavicles strongly curved; sacral diapophyses strongly dilated; sacrum articulating with the coccyx by a single condyle; terminal phalanges simple. Type *Leptobrachella mjobergi*.

Allied to *Megalophrys* Kuhl and v.Hasselt, but differing in the more rudimentary sternal apparatus and shape of the digital extremities. As it is well known the genus *Megalophrys* is sharply divided into two groups—those with rounded, truncate snouts and those with pointed, projecting snouts; it is the former, originally named *Leptobrachium* that this new species most closely resembles in general physiognomy. I have much pleasure in naming it after its discoverer.

60. LEPTOBRACHELLA MJÖBERGI sp. nov.



A Sternal apparatus. $\times 9$. B Terminal phalanx. $\times 9$.
C Sacrum and coccyx. $\times 4$. D Hand. $\times 3$.

Type author's number 8124, collected on Mt. Gadin, alt. 2000 feet, near Lundu, Western Sarawak, by Dr. Eric Mjöberg in May 1924.

Description of the type. Tongue distinctly notched behind; no vomerine teeth. Head as broad as long, snout broadly rounded, a little longer than the eye, not projecting beyond the lower jaw; nostril a little nearer the tip of the snout than the eye; canthus rostralis distinct but rounded, loreal region oblique, concave; interorbital space broader than the upper eyelid; tympanum very distinct, circular, its diameter half that of the eye and distant from it by nearly its own width.

Fingers moderately long, their tips dilated but terminating in a point; first finger much shorter than second and about half the length of the third; second and fourth equal; a single very large inner carpal tubercle and a minute outer one. Toes with tips like those of the fingers, webbed at the base; fifth toe distinctly shorter than the third; no subarticular tubercles; a flat indistinct, elongate, inner metatarsal tubercle; no outer. Tibia half the length of the head and body; the heel reaches the nostril.

Skin of the upper parts very finely granular, of the sides coarsely granular below quite smooth; a well marked glandular fold from the eye to the shoulder and a fine glandular line starting from the termination of the supratympanic fold and extending backwards nearly to the groin.

Olive-brown above with faint darker markings, sides speckled with light and dark markings, lips with light and dark bars; inner sides of tibiae marbled with light and dark and a pale patch on each heel; two light spots at the back of each thigh; below brownish.

Measurements. From snout to vent 23; length of head 7.5; eye 2.5; arm 11; hand (to tip of third finger) 4.5; leg 34; tibia 12; foot 9.5 mm.

A second specimen from the same locality, No. 8125, is a female with ova. It measures 21 mm. from snout to vent and does not differ in any notable respect from the type.

BUFONIDAE.

61. BUFO LEPTOPUS Günth.

Kuching.

62. BUFO MELANOSTICUS Schneid.

Kuching; Mt. Matang.

63. BUFO ASPER Gravenh.
Baram station; Mt. Dulit, 5000 feet.
64. BUFO QUADRIPORCATUS Bouleng.
Saratok; Bidi; Kuching; Mt. Poi, 3000 feet.
65. BUFO DIVERGENS Peters.
Mt. Matang; Mt. Gadin.
66. BUFO SPINULIFER Mocquard.
5 examples from Mt. Gadin.

Bufo spinulifer was described in 1890 from three examples obtained on Mt. Kinabalu and does not seem to have been met with since.

The specimens mentioned above, with the exception of one which is a juvenile, are from two-thirds to three-quarters grown. They agree well with Mocquard's description except that the lateral tubercles, instead of being confluent into a thick ridge as indicated in the figure, are broken up into a chain of warts. Moreover it cannot be said that the warts upon the back generally, are arranged in any definite longitudinal series. The tympanum is very distinct in one and is two-thirds the diameter of the eye, it is less distinct in the others and is about half the diameter of the eye: the tibio-tarsal articulation reaches the tip of the snout in two examples; the toes are about one-third webbed. The colour is as in the description.

67. BUFO BORBONICA Boie.

Nectophryne borbonica, van Kampen, Amphib. Indo-Austr. Archipel., 1923, p. 70.

11 specimens from Mt. Poi at between 3000 and 5000 feet altitude; 15 from Mt. Penrissen at between 2000 and 4500 feet.

In the absence of any true dilatation of the finger-tips, and in the rudimentary character of the web of the fingers if present at all, this toad appears to me to partake more of the character of *Bufo* than of *Nectophryne*, and I have therefore placed it under the former genus.

Boulenger has recorded his *Bufo jerboa* from Mt. Penrissen, and the very close resemblance of his description of *jerboa* to that of *borbonica* leads me to believe that the two species will have to be united. Without his actual material for comparison I do not care to do so.

I have recently examined a large series of *B. borbonica* from near Kuan Nieng, S.W. of Patalung, in Peninsular Siam.

68. *NECTOPHRYNE GUENTHERI* Bouleng.

Mt. Poi, 4500--5000 feet.

69. *NECTOPHRYNE EVERETTI* Bouleng.

Mt. Dulit, 4000 feet.

One imm. ex. ; from snout to vent 19 mm.

The tympanum is entirely hidden. Colour in alcohol, light brown above with very dark brown markings; warts on the flanks whitish.

70. *NECTOPHRYNE SIGNATA* Bouleng.

11 exs. from Mt. Penrissen at 2000 feet.

The largest measures 38 mm. from snout to vent; all the others are under 28 mm.

I have referred these specimens to *N. signata* which may have been described from a very young example. As shown by the specimens mentioned above, the characters which define this species are not very constant. The tympanum is variable in size and may be from two-thirds to less than one-half the diameter of the eye; it is always very distinct. The web of the toes is fuller in the juveniles than in the large specimen, but three phalanges of the fourth toe are always free, although the membrane extends as a fringe along either side to the disc. The heel reaches the tip of the snout in some and to well beyond in others. The discs of the fingers are strongly dilated and truncate at the end in the largest example, not so strongly dilated in the juveniles.

The colour above is light or dark brown with most of the larger warts tipped with pink. Limbs yellowish or brownish barred with darker brown. Below yellowish, spotted and speckled with black.

BREVICEPITINAE.

71. *KALOPHRYNUS PLEUROSTIGMA* Tschudi.

Kuching.

72. *SPHENOPHRYNE LEUCOSTIGMA* Bouleng.

Kuching. I have elsewhere referred to the status of this species (*antea* p. 13).

73. *GASTROPHRYNE BORNEENSIS* Bouleng.

One specimen from Kuching of this rare frog. It agrees well with the description except that I cannot find any transverse dermal ridge across the palate between the choanae. From snout to vent it measures 30 mm. in length.

74. *MICROHYLA ANNECTENS* Bouleng.

Mt. Matang; Mt. Dulit.

RANIDAE.

75. *RANA LIMNOCHARIS* Boie.

Kuching; Saratok; Mt. Matang; Mt. Gadin.

76. *RANA MACRODON* Kuhl.

Kuching; Saratok; Mt. Matang; Mt. Gadin.

77. *RANA KUHLI* Schleg.

Mt. Dulit, 4000 feet; Mt. Penrissen, 2000 to 4000 feet.

78. *RANA LATICEPS* Bouleng.

6 specimens from Mt. Penrissen at 3000 feet; 4 from Mt. Gadin.

This frog has not previously been found south of the Malay Peninsula where it is extremely common on certain hills (Pahang, Perak).

79. *RANA PALAVANENSIS* Bouleng.

16 exs., Mt. Penrissen, 3000 feet; Mt. Gadin.

In all the specimens from Mt. Penrissen—except in one immature example—the interorbital space is broader than the upper eyelid.

80. *RANA GLANDULOSA* Bouleng.

Kuching.

81. *RANA SIGNATA* Günth.

3 female examples from Bidi.

82. *RANA NICOBARIENSIS* Stolic.
4 examples from the Trusan river, Sarawak.
83. *RANA ERYTHRAEA* Schleg.
Santubong; Mt. Gadin.
84. *RANA CHALCONOTA* Schleg.
Santubong.
85. *RANA HOSII* Bouleng.
Bidi.
86. *RANA JERBOA* Günth.
Mt. Gadin.
87. *OXYGLOSSUS LAEVIS* Günth.
Mt. Dulit, 4000 feet.
88. *STAUROIS GUTTATUS* Günth.
Mt. Matang; Mt. Penrissen, 2000 feet; Mt. Gadin.
Evidently common on Mt. Gadin, no less than 16
examples being collected.
89. *STAUROIS TUBERILINGUIS* Bouleng.
4 examples from Mt. Penrissen at 2000 and 4000
feet. For the present I have called these specimens
S. tuberilinguis although they agree in some respects
with *S. nubilis* Mocquard which E. H. Taylor maintains
(Philippine Amphibia, 1920, p. 276) should become a
synonym of *S. natator* Cope.

The 4 examples mentioned above, another in my own collection from Mt. Kinabalu and a sixth from the Baram river, all agree in having upon the upper parts and flanks a number of large, flat, rounded, or elongated glandules upon a smooth or finely granulate skin. The heel in the juvenile example reaches to beyond the tip of the snout, in the two larger ones (31 and 40 mm. from snout to vent respectively) to the nostril. All have a well marked papilla upon the tongue.

90. RHACOPHORUS LEUCOMYSTAX Kuhl.

Kuching; Matang.

91. RHACOPHORUS OTILOPHUS Bouleng.

1 ex. Baram district. Colour in alcohol, pale greyish above, with black spots and fine longitudinal lines, greyish-white below; thighs and inner surfaces of tibiae with many narrow jet black cross-bars.

92. RHACOPHORUS SHELFORDI Bouleng.

4 exs. Mt. Penrissen, 4500 feet.

The heel in one specimen reaches to the tip of the snout. The dark markings upon the head and back recorded by Boulenger are present in two of the four; in the others the upper parts are more or less uniform purplish-brown in colour. Two of the specimens are thickly spotted with grey below. The largest example, a female with ova, measures 58 mm. from snout to vent. The eggs are large and colourless.

93. RHACOPHORUS NIGROPALMATUS Bouleng.

Kuching.

94. PHILAUTUS PETERSI Schleg.

Mt. Penrissen; Mt. Poi; Kalabit country. I have elsewhere remarked (*antea* p. 10) on what I believe to be the true status of this frog.

95. PHILAUTUS LONGICRUS Bouleng.

2 examples from Mt. Poi at 3000 feet. They agree well with the description of this frog except that the discs of the fingers are as large as the tympanum and the throat is finely granular. One specimen has a pale patch of colour upon the snout, a second upon the shoulders and an oblong pink patch on either side above the forearm. The heel in each example reaches to far beyond the tip of the snout. The larger of the two measures 24 mm. from snout to vent. The species has hitherto been recorded only from Palawan.

**V.—List of some Katydids (Tettigoniidae)
in the Sarawak Museum.** By H. H. KARNY,
Buitenzorg, Java.

Dr. Mjöberg was kind enough to send me the katydids and walking-stick insects collected by him, especially on Mt. Murud and Mt. Dulit, for determination. In the following pages I give a list of the Tettigoniidae, whilst the Gryllacridae and Phasmoidea will be reserved for future papers. I wish to express my thanks to Dr. Mjöberg for the opportunity of studying this small but interesting collection.

SUBFAM. SCAPHURINAE (syn. PHANEROPTERINAE).

MIROLLIA Stal.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 136 (with list of literature).

MIROLLIA LUTEIPENNIS n. sp.

♂, ♀. General colour green, hind wings (except the green apex) orange red. Pronotum practically as in *M. carinata*, but the median longitudinal keel more tender, less elevated, distinctly interrupted by the transversal sulci, the second of which V-shaped, backwards produced in a fine longitudinal furrow replacing there (between second and third sulcus) the

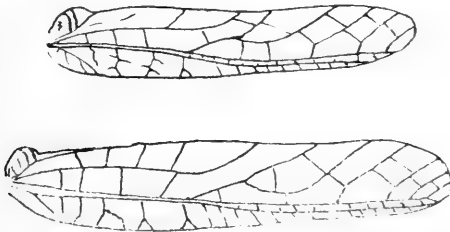


Fig. 1. Left tegmen of *Mirollia luteipennis* (above), and *gracilis* (beneath). ♂. Enlarged.

longitudinal carina. Fore coxae unarmed. Fore tibiae slightly sulcate above, without spine, beneath with a few short spines. Tibial foramina as in *M. carinata*, viz., the outer one broadly open, the inner shell-shaped. Hind knees concolourous. Tegmina longer and narrower than in *M. carinata*. arrangement of veins practically the same as in that species; radial branch going off in the middle. Anal field of ♂ distinctly narrower than in *M. carinata*. Hind wings bright coloured.

♂. Supra-anal plate longer than wide, in basal part almost parallel-sided, then broadened, with a twice sinuated apical margin. Cerci long, slender, somewhat curved, crossed with each other, not embracing the subgenital plate, but lying upon

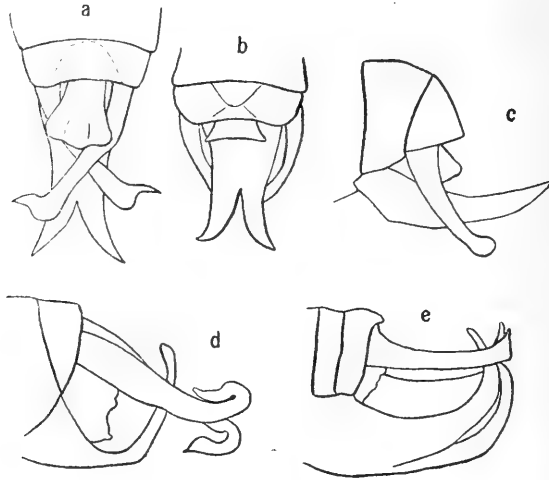


Fig. 2. ♂ genitalia of *Mirollia*: a *luteipennis*, b and c *gracilis*, d *carinata*, e *Deflorita deflorita*. a & b dorsal view, c, d, e, lateral view. Enlarged.

this; distinctly thickened before the end, which is produced into a sharp spine. Subgenital plate long, nearly plain, at the end divided by a deep triangular incision in two sharply pointed lobes.

♀. Subgenital plate of nearly the same shape as in *M. carinata*, but the incision a little narrower and the lobes somewhat more rounded. Ovipositor as in *M. carinata*.

Measurements :	♂	♀
Length of body	22.5 mm.	13 mm.
	(too much contracted)	
„ „ pronotum	4.8 mm.	4.5 mm.
„ „ tegmina	26 „	27 „
„ „ hind femora	12.8 „	14 „
„ „ ovipositor	—	6 „

1 ♂, 1 ♀ from Mt. Dulit.

This new species comes by its general characters to the *Mirollia*-group and seems to be intermediate between *Deflorita* and *Mirollia*, somewhat closer related to the latter. The longitudinal keel of pronotum is conspicuously less developed than in *M. carinata*, whilst entirely wanting in *Deflorita*. The longer and narrower tegmina somewhat resemble *Deflorita*, but the hind margin is nearly straight, very slightly equally curved, not sinuated as in *Deflorita*. The ♂ genitalia agree better with *Mirollia* than with *Deflorita*, differing however from both these genera. The bright coloured wings represent also a good specific character, diverging from *Deflorita* and *M. carinata*, in which both the hind wings are (except the green apex) absolutely colourless. Apparently also in the two *Mirollia*-species described recently by Hebari the wings are colourless, because the author says nothing thereon. The ♂ genitalia, further, differ also in these two species from both described here.

MIROLLIA GRACILIS n. sp.

♂. Very similar to the preceding species, differing from it by the somewhat smaller size and the pale lemon yellow hind wings. Sculpture of pronotum as in *luteipennis*. Fore tibiae blackish near the foramina and before the tarsus. Hind knees black. Radial branch of tegmina arising somewhat before the middle. ♂ genitalia very similar to those of *luteipennis*, but the cerci embracing the subgenital plate, and the supra-anal plate distinctly wider and shorter than in the preceding species.
♀ unknown.

Measurements: Length of body 17 mm., of pronotum 4 mm., of tegmina 22 mm., of hind femora 11.5 mm.

1 ♂ from Mt. Dulit; having the right middle leg regenerated, only half as long as the left, the tibia a little curved, without spines, the tarsus composed of 4 extraordinarily short joints (which are broader than longer).

This species differs from *M. carinata* and *Deflorita* by the same characters as *luteipennis*, from this especially by the paler wings, the earlier arising radial branch, the black knees and the shape of ♂ genitalia.

ANCYLECHA Serville.

1839. Serville, Hist. Nat. Ins. Orth., p. 411.
 1869. Walker, Cat. Derm. Salt. Brit. Mus., ii, p. 357.
 1876. Stål, Bih. Svensk. Akad., iv, (5) p. 56.
 1878. Brunner v. W., Mon. Phan., p. 159.
 1891. Brunner v. W., Verh. zool.—bot. Ges. Wein, xli, p. 11.
 1906. Kirby, Syn. Cat. Orth., ii, p. 422.

ANCYLECHA FENESTRATA Fabricius.

1793. Fabricius, Ent. Syst., ii, p. 34 (*Locusta*).
 1838. Burmeister, Handb. Ent., ii, p. 692 (*Phylloptera*).
 1839. Serville, Hist. Nat. Ins. Orth., p. 411 (*Lunuligera*).
 1842. Dehaan, Temminck, Verh., Orth., p. 197 (*Locusta Phylloptera f.*).
 1869. Walker, Cat. Derm. Salt. Brit. Mus., ii, p. 357 (*Lunuligera*).
 1878. Brunner v. W., Mon. Phan., p. 160.
 1904. Krausze, Ins. Börse, xxi.
 1906. Kirby, Syn. Cat. Orth., ii, p. 422.
 1920. Karny, Zool. Wedeel., v, 4, p. 209.
 1921. Karny, Trop. Nat., x, 5, p. 68 (fig. 5b), 69.
 1921. Karny, Treubia, i, 4, p. 296.
 1922. Hebard, Proc. Ac. Nat. Sci. Philad., lxxiv, p. 139.

A fine, large ♂ specimen from Mt. Murud, 6000 feet, distinctly larger than the Javanese specimens, viz., length of body 34 mm., of pronotum 10.3 mm., of tegmina 71 mm., of hind femora 39 mm., width of tegmina 27.5 mm. Otherwise perfectly agreeing with specimens from Java.

ARNOBIA Stal.

ARNOBIA PHILIPES (De Haan).

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 139 (with list of literature).

1 ♂ from Lio Matu, 1 ♂ from Mt. Murud 6500 feet.

TAPIENA Bolivar.

TAPEINA Brunner 1878, 1891; Kirby 1906.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 139 (where by a misprint the genus is by all authors mentioned as *Tapiena*).

TAPEINA CUCULLATA (Brunner v. W.).

1891. Brunner v. W., Verh., zool.—bot. Ges. Wien, xli, p. 74. (*Tapeina*).

1891. Karsch, Berl. Ent. Zeitschr., xxxvi, i, p. 210. (*Tapeina*).

1906. Kirby, Syn. Cat. Orth., ii, p. 424. (*Tapeina*).

2 ♀ from Mt. Dulit, one of them freshly emerged, agree fully with Brunner's short description. Nevertheless, it is possible that they may be a different species, as Brunner's diagnosis is very short and he gives no figure of ♀ subgenital plate. The detection of Bornean ♂ specimens only could decide this problem, because the differences in ♀ characters are very slight.

STICTOPHAULA Hebard.

1922. Hebard, Proc. As. Nat. Sci. Philad., lxxiv, p. 150.

STICTOPHAULA SPINOSO-LAMINATA (Brunner v. W.).

1842. De Haan, Temminck. Verh. Orth., p. 194. (*Locusta Phaneroptera japonica*, Partim).

1878. Brunner v. W., Mon. Phan., p. 168. (*Phaula*).

1891. Brunner v. W., Verh. zool.—bot. Ges. Wein, xli, p. 80. (*Phaula*).

1906. Kirby, Syn. Cat. Orth., ii, p. 426 (*Phaula*).

1920. Karny, Zool. Mededeel., v, 4, p. 193 (*Phaula*).

2 greyish-green ♀ from Mt. Murud, 6500 feet, perfectly agreeing in all characters with Javanese specimens of Buitenzorg Museum.

The species was known hitherto from Java only.

HOLOCHLORA Stal.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 153 (with list of literature).

HOLOCHLORA ENSIS (De Haan).

Karny, l. c., p. 155 (with list of literature).

1 ♂ from Mt. Dulit, 1 ♀ (in alcohol) from Kalabit country, 3000 feet, leg. Mjöberg.

HOLOCHLORA OBTUSA Brunner v. W.

1878. Brunner v. W., Mon. Phan., p. 178.

1891. Brunner v. W., Verh. zool.—bot. Ges. Wien, xli, p. 89.

1906. Kirby, Syn. Cat. Orth., ii, p. 431.

I place in this species with some doubt 1 ♀ from Mt. Dulit, differing from *venosa* by its distinctly large size, viz., length of tegmina 59 mm. of hind femora 38 mm. otherwise agreeing with the measurements given by Brunner for *H. obtusa*.

The antennae are reddish-brown, not black, as described by Brunner. Ovipositor a little larger and considerably longer than in Javanese specimens of *H. venosa* (Buitenzorg Museum). Subgenital plate having the form of an equally-sided triangle, blunt at apex, according to Brunner (1878, p. 178) "brevissima, triangularis, obtusa." I find a slight difference there against the Javanese specimens of *H. venosa* before me, as these latter have this plate a little more slender and distinctly excised at extreme apex, whilst Brunner says thereon (1878, p. 175): "brevis, triangularis, apice submarginata;" and (1891, p. 89): "apice integra...triangularis, elongata." It is very difficult to recognize a species with certainty from such contradictory statements.

H. obscura was known hitherto from Malay Peninsula only.

SYMPAESTRIA Brunner v. W.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 156 (with list of literature).

SYMPAESTRIA ACUTEJOBATA Brunner v. W.—Karny l. c.

1 ♀ from Lio Matu. Dr. Mjöberg has written on the label: "face greenish-white, underside.....salmon-coloured."

SUBFAM. MECOPODINAE.

CHARACTA Redtenbacher.

1892. Redtenbacher, Verh. zool.—bot. Ges. Wein, xlii, p. 207.
 1906. Kirby, Syn. Cat. Orth., ii, p. 361.
 1916. Caudell, Wytzman, Gen. Ins., fasc. 171, p. 21.

CHARACTA BITUBERCULATA Redtenbacher.

1892. Redtenbacher, Verh. zool.—bot. Ges. Wein, xlii, p. 207.
 1906. Kirby, Syn. Cat. Orth., ii, p. 361.
 1916. Caudell, Wytzman, Gen. Ins., fasc. 171, p. 21.

I place in this species 1 ♀ from Mt. Murud, 6000 feet, which agrees well with characters given by Redtenbacher, diverging by the more distant transverse veins of tegmina, the subgenital plate (♀) rounded, not incised at apex, and especially by its somewhat smaller size, viz. :—

Length of body 34.5 mm. of pronotum 8.5 mm. of tegmina 40.5 mm. of fore femora 20 mm. (hind femora wanting), of ovipositor 22 mm.

Hind wings distinctly shorter than tegmina. Lateral keels of pronotum quite as in *bituberculata*, much differing from *Ch. rehnii*.

SUBFAM. PTEROPHYLLINAE (syn. PSEUDOPHYLLINAE).

ONOMARCHUS Stal.

Karny, Journ. R. As. Soc., Mal. Br. 87, 1923, p. 168 (with list of literature).

ONOMARCHUS MANDARINUS Pictet & Saussure.

Syn. *O. cretaceus* Pictet & Saussure (nec Serville).

O. LEUCONOTUS Karny (nec Serville), l. c.

For synonymy see: Karny, Treubia, v, 1—3, 1924.

1 ♂ and 1 ♀, both in alcohol, from Baram River, which agree perfectly with Javanese specimens, except that the ♀ has a bright red spot on each side at base of ovipositor which I have found in Javanese specimens.

To the same species belongs very probably also a ♀ larvæ (dry) from Mt. Dulit.

PROMECA Brunner v. W.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 170 (with list of literature).

PROMECA QUADRIPUNCTATA Brunner v. W.

1895. Brunner v. W., Mon. Pseudoph., p. 53.

1906. Kirby, Syn. Cat. Orth., ii, p. 299.

1922. Hebard, Proc. Ac. Nat. Sci. Philad., lxxiv, p. 195.

1 ♀ from Mt. Dulit, differing from Javanese specimens by its somewhat larger size, viz., length of body 34.5 mm. of pronotum 8 mm. of tegmina 48 mm. of hind femora 19 mm. of ovipositor 21.5 mm.

OLCINIA Stal.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 177 (with list of literature).

OLCINIA PILIFRONS n. sp.

♀. Very similar to *H. crenifolia*, from which it differs by the following characters:—Forehead to a great extent black, this colour being somewhat produced on cheeks, whilst these are entirely pale in *H. crenifolia*; upper part of forehead densely set with long, stiff, yellow hairs, being quite bald in *H. crenifolia*. Pronotum (fig. 3a) shorter, less sculptured, at the fore

margin broadly rounded, not produced in two tubercles as in *crenifolia* (fig. 3b). Radial vein of tegmina (fig. 3e) wider

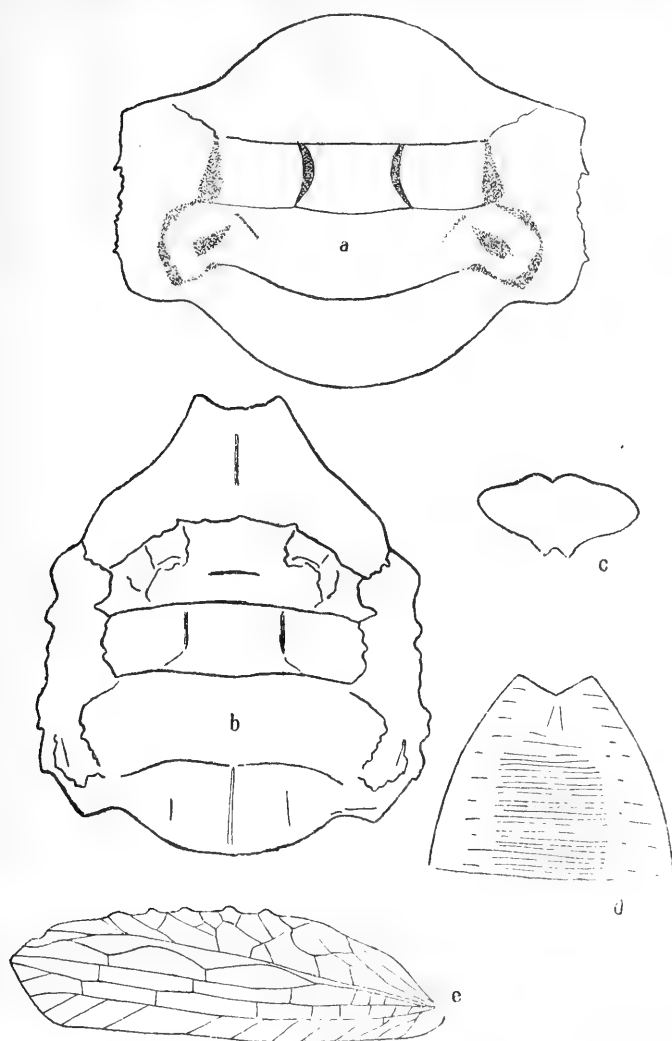


Fig. 3. *Olcinia pilifrons* (a, c, e) and *crenifolia* (b, d). a, b pronotum; c, d ♀ subgenital plate; e tegmen. Enlarged.

separated from subcosta, especially at the two backwards produced angles, whilst these are less produced in *H. crenifolia*

and the two veins there being nearly contiguous. All femora narrower (fig. 4), not undulated beneath, closely set with long, stiff, yellow hairs, those on the lower margin about as long as

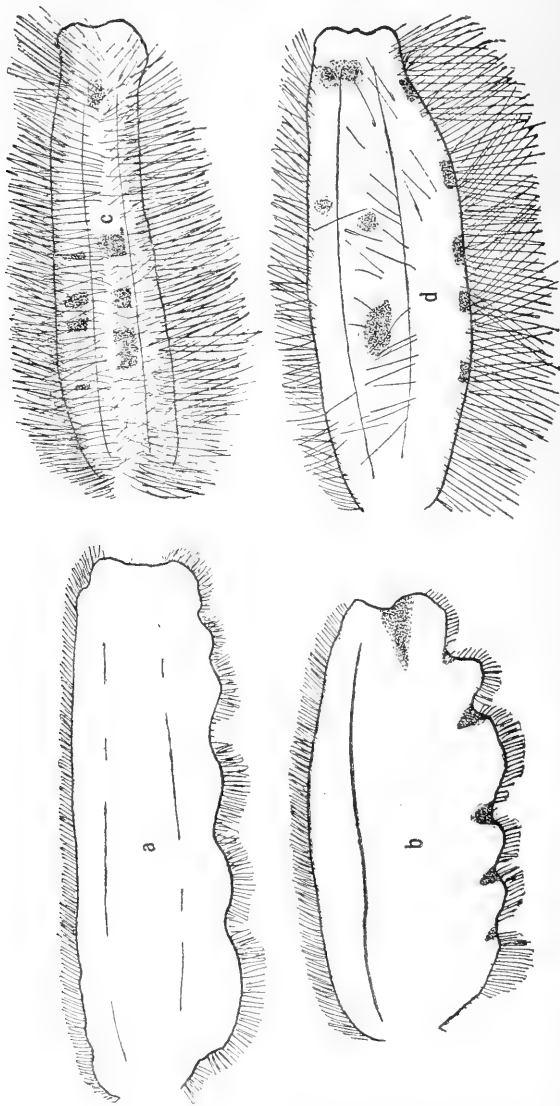


Fig. 4. Fore (a, c) and middle (b, d) femora of *Olcinia crenifolia* (a, b) and *O. pilifrons* (c, d). Enlarged.

the femur wide, much longer than in *H. crenifolia*; inferior margin of fore and hind femora equally curved, without lobes. Hind knees in larger extent deep black, nitid; of the same colour also the end of hind tibiae. Subgenital plate (fig. 3c) of ♀ much shorter, apically more narrowed, not transversely striated as it is in *H. crenifolia* (fig. 3d).

Measurements: Length of body 31.5 mm. of pronotum 6 mm. of tegmina 50 mm. of hind femora 16 mm. of ovipositor 16.5 mm.

1 ♀ from jungle at the foot of Mt. Dulit.

SUBFAM. MECONEMINAE.

XIPHIDIOPSIS Redtenbacher.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 178 (with list of literature).

XIPHIDIOPSIS BORNEENSIS n. sp.

♂, ♀. Small and slender. Yellowish green, with a distinct pale yellow length band on each side of pronotum, continued as a brownish yellow stripe throughout the hind margin of tegmina. Disc of pronotum strongly produced backwards, with rounded hind margin. Lateral lobes not very high, rounded triangular, their hind margin very oblique, slightly S-shaped, without a distinct humeral sinus. Foramen of prothorax free, oblique, narrow, somewhat pointed on both ends. Tegmina reaching nearly to the hind tarsus, with strong, yellow transverse veins. Radial branch arising far before the middle, without a spurious vein at the base. Hind wings hardly (less than 1 mm.) overreaching the tegmina. All femora without spines on both margins; the hind ones strongly dilated in basal part, very slender distad. Tibial foramina open on both sides. Fore tibiae beneath with 4 movable, long, pale spines on each side. Middle tibiae strongly compressed in the two basal thirds, slender distad; spines as on the fore pair, but a little shorter.

♂. Anal segment slightly rounded, somewhat emarginate in the middle. Cerci thick at base, slightly curved, close

behind the middle with a rounded, upwards directed lobe,

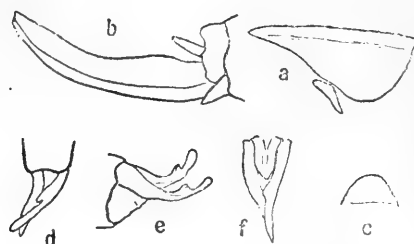


Fig. 5. *Xiphidiopsis borneensis*. a pronotum (lateral view); b ovipositor; c ♀ subgenital plate; d—f ♂ genitalia (d dorsal, e lateral, f ventral view). Enlarged.

slightly dilated and blunt at apex. Subgenital plate longer than wide, rectangularly pointed at apex; styles not distinguishable with certainty.

♀. Ovipositor shorter than usual in the genus, slightly up-curved, with smooth margins, blunt at apex. Cerci conical, not narrowed basad. Subgenital plate rounded.

Measurements :	♂	♀
Length of body	8.5 mm.	8 mm.
,, ,, pronotum	3.2 ,,	3 ,,
,, ,, tegmina	17.7 ,,	15 ,,
,, ,, hind femora	8 ,,	7.4 ,,
,, ,, ovipositor	...	3.5 ,,

1 ♂ from Mt. Murud (6500 feet) and 1 ♀ from Mt. Dulit.

This new species comes in my key (Treubia, v, 1—3, pp. 110—111) very near to the Sumatran *X. hebari*, and agrees therewith by the strong cross veins of tegmina, the yellow length stripes on pronotum, by the shape of ♂ anal segment, and by the extraordinarily short ovipositor. It differs, however, from *X. hebari* by the shape of ♂ subgenital plate.

By the enumerated characters it may be distinguished from all the hitherto known *X. phidiopsis*-species, and thus it can also not be mistaken for one of the Malayan species recently described by Hebard (Proc. Nat. Sci. Philad., lxxiv, 1923, p. 253 ff.).—These differ at the first view by the entirely otherwise shaped ♂ genitalia.

XIPHIDIOPSIS MJÖBERGI n. sp.

Pale yellowish, apparently green when alive. Eyes dark brown. Pronotum unicolorous, strongly produced backwards, with rounded posterior margin. Lateral lobes with an obtuse, rounded angle in front and beneath; hind margin very oblique, slightly sinuated, without a distinct humeral sinus. Foramen of prothorax somewhat broadly open, not obtected by the lateral lobes. Tegmina long and narrow, of the same colour as the body, in their distal half with about 6 very minute blackish dots between the branches of radial sector, further before the first and behind the last branch; these are distinct in ♀ ♀, not visible in the ♂ ♂ before me. Radial sector arising distinctly before the middle, with 4—5 branches; at the base no spurious vein or a very indistinct one. Cross veins not unusually thickened, of the same colour as the tegmina themselves. Hind wings overreaching the tegmina by about 1.5 mm. Tibial foramina open on both sides. Fore tibiae with 4 pairs of long, pale spines. Middle tibiae somewhat compressed in the basal half (less than in the preceding species), slender in the apical third; their spines (4 on outer, 2—3 on inner margin) hardly more than half as long as those of fore tibiae. Hind tibiae very slender, densely spined above, and with six spines in the apical half beneath.

♂. (Type). Anal segment simple, with roundly sinuated hind margin. Supra-anal and anal plates not visible. Cerci curved, thick based, slender distad, with a strong, acute, spine-

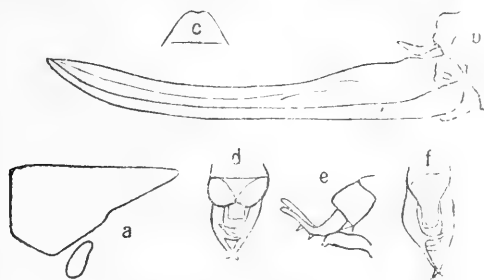


Fig. 6. *Xiphidiopsis mjöbergi*. Meaning of letters as in fig. 5. Enlarged.

like process near the middle, pointed at apex. Subgenital plate about quadrate when seen from above, longer than broad at base when seen from beneath, basad more than twice as wide as distad, with truncate margin. Styles rudimentary.

♀. Cerci distinctly constricted basad, broadest near the middle, not very acute at apex. Ovipositor nearly straight, very slightly upcurved, with smooth margins, acute at apex. Subgenital plate bluntly triangular, slightly emarginated at apex.

Measurement :	♂	♀
Length of body ...	8.5—10.3 mm	10.3—11 mm
" " pronotum ...	3.3— 3.8 "	3.2—3.4 "
" " tegmina ...	17—17.7 "	17.4—18 "
" " hind femora ...	9.5 "	9.5 "
" " ovipositor ...		7.3—7.5 "

2 ♂♂ from Mt. Dulit, 1 ♀ from Mt. Murud, and 1 ♀ from Pah Trap.

I have allowed myself the pleasure of naming this new species after its discoverer, Dr. Eric Mjöberg, late Curator of the Sarawak Museum.

This new species comes in my key (1. c.) to the *fallax-kraussi*-group, but differs from all these species by the simple ♂ segment and also by the shape of cerci. By these characters it resembles somewhat to *Amytta nigri-gutta* and *Meconemopsis borellii*. But it differs from both these widely by its generic characters and also by the details of ♂ genitalia, especially by the very rudimentary styles. I am not quite sure whether the ♀♀ described above belong to the same species, as they differ from the ♂♂ by their unicolorous, not blackish dotted tegmina. If they should prove to belong to another species, the ♂♂ should be regarded as types of *X. mjobergi*.

EUANISOUS Hebard.

1922. Hebard, Proc. Ac. Nat. Sci. Philad., lxxiv, p. 262.

When I wrote my "Prodromus der malayischen Meconeminen" (Treubia, v. 1. c.), I had not yet seen Mr. Hebard's paper. I agree perfectly with him in separating this genus from the true *Xiphidiopsis*.

EUANISOUS TEUTHROIDES (Bolivar).

1905. Bolivar, Ann. Mus. Nat. Hungar., iii, p. 391. (*Xiphidiopsis*).

1907. Karny, Abh. zool.—bot. Ges. Wien, iv, 3, p. 100. (*Xiphidiopsis*).

1912. Karny, Wytzman, Gen. Ins., fasc. 131, p. 6. (*Xiphidiopsis*).
 1912. Karny, Ber. Zool. Mus. Dresden, xiv, 2, p. 22. (*Xiphidiopsis*).
 1922. Hebard, Proc. Ac. Nat. Sci. Philad., lxxiv, p. 262.

Bolivar mentioned in his "Conocéphalides de la Nouvelle-Guinée" this species from "Singapore," so that it seemed there was another place of this name also; I have therefore included this species in my list of New Guinean Conocephalidae (s. l.), but I cannot find a "Singapore" on any map of New Guinea, whilst Bolivar said nothing about this "Nouvelle-Guinée" species, coming from Straits Settlements. Hebard, however, got recently material of this species from Singapore, Straits Settlements, and thus I think Bolivar's specimen might also have been collected at the same locality.

I place therefore in the same species some specimens (2 ♂, 3 ♀) from Mt. Dulit collected by Mjöberg. The ♀ agree perfectly with Hebard's description, and the ♂ are also tolerably conformable with the characters given by Bolivar. As may be seen from my description of *E. mirabilis*, I think the large plate above the subgenital plate, described by Redtenbacher and Bolivar as supra-anal plate, should probably be rather a subanal plate. Its shape agrees very well with Bolivar's "lamina supra-anal." Also the cerci show accurately the same shape as described by that author. The subgenital plate, however, is very deeply incised, having a large lobe on each side of this incision, not mentioned by Bolivar. As Redtenbacher says in the description of the very closely allied Javanese species *distincta* "margine interno basi

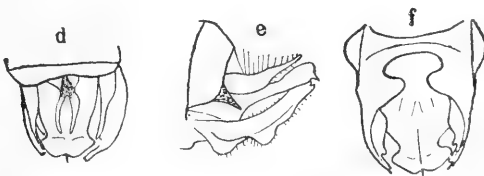


Fig. 7. *Euanisous teuthroides* (?). Meaning of letters as in fig. 5. Enlarged.

rotundato," I think this lobe may also be present in *teuthroides*. The tricuspidate apical lobes of this plate, on the other hand, agree very well with Bolivar's description. Thus

I am not absolutely sure that I have the same species before me as Bolivar, but I find it still very probable. At all events, I give here figures of the ♂ genitalia of one of the Bornean specimens before me. In every case this species differs by these characters from both *E. distincta* Redtenbacher and *E. mirabilis* Karny, whilst it agrees with them by its hind tibiae distinctly spined beneath in the apical half, which were described by Bolivar as unarmed in *E. teuthroides*. Hebard (l. c.), however, stated: "The caudal tibiae.....are in the topotypic material before us armed dorsad with small spines and ventrad, except in proximal portion, with slightly larger spines, distad with three pairs of spurs. The male before us agrees so closely in every other detail with Bolivar's description that we are convinced "femora" instead of "tibiae" was intended. Thus *E. distincta* appears to be separable mainly by its smaller size, unarmed mesosternum and by male genitalia differences." Therefore, I think the arming of hind tibiae in the material before me to be no reason for separating it from *teuthroides*, as the mesosternum is distinctly bituberculate in both.

SUBFAM. HEXACENTRINAE (syn. LISTROSCELINAE).

HEXACENTRUS Serville.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 182 (with list of literature).

HEXACENTRUS MUNDUS (Walker).

1869. *Piuramunda* Walker, Cat. Derm. Salt. Brit. Mus., ii, p. 282;
Tedla sellata Walker l. c., p. 393.
1870. *Tedla simplex* Walker, Cat. Derm. Salt. Brit. Mus., iii, p. 484.
1891. Redtenbacher, Verh. zool.—bot. Ges. Wien, xli, p. 551 (*annulicornis*, nec. Stal).
1906. Kirby, Syn. Cat. Orth., ii, p. 287 (*munda*).
1907. Karny, Abh. zool.—bot. Ges. Wien, iv, 3, p. 108 (*annulicornis*, nec. Stal).
1912. Karny, Wytsman, Gen. Ins., fasc. 131, p. 15 (*munda*).
1912. Karny, Abh. Ber. Zool. Mus. Dresden, xiv, 2, p. 19, 23 (*munda*).
1913. Bolivar, Asoc. Esp. Progr. Cienc., 4 a, Ci. Nat., p. 8 (*munda*).
1915. Brunner, Univ. Stud. Lincoln, xv, 2, p. 271 (*munda*).
1922. Hebard, Proc. Ac. Nat. Sci. Philad., lxxiv, p. 269.

1 ♂ from Lio Matu and 1 ♀ from Mt. Murud, 6500 feet, both having all two basal joints of tarsi pale.

SUBFAM. CONOCEPHALINAE.

XIPHIDION Serville.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 182 (with list of literature).

XIPHIDION LONGIPENNE (De Haan).

Karny, l. c., p. 183 (with list of literature).

I believe Mr. Hebard is right in uniting this species with Redtenbacher's *longicornae*.

1 ♂ and ♀ of this common and widely spread species from Mt. Dulit.

SUBFAM. AGRAECIINAE.

MACROXIPHUS Pictet.

1888. Pictet, Mém. Soc. Genève, xxx (6), p. 52.
 1891. Redtenbacher, Verh. zool.—bot. Ges. Wien, xli, p. 468.
 1896. Brongniart, Bull. Soc. Philom., (8) viii, p. 127.
 1905. Dohrn, Stett. Ent. Zeit., lxvi, p. 242.
 1906. Kirby, Syn. Cat. Orth., ii, p. 263.
 1907. Karny, Abh. zool.—bot. Ges. Wien, iv, 3, p. 55, 72.
 1912. Karny, Wytzman, Gen. Ins., fasc. 141, p. 30.

MACROXIPHUS VAGINATUS Pictet.

1888. Pictet, Mém. Soc. Genève, xxx (6), p. 53. •
 1891. Redtenbacher, Verh. zool.—bot. Ges. Wien, xli, p. 468.
 1896. Brongniart, Bull. Soc. Philom., (8) viii, p. 129.
 1905. Dohrn, Stett. Ent. Zeit., lxvi, p. 243.
 1906. Kirby, Syn. Cat. Orth., ii, p. 264.
 1907. Karny, Abh. zool.—bot. Ges. Wien, iv, 3, p. 72.
 1912. Karny, Wytzman, Gen. Ins., fasc. 141, p. 31.
 1922. Hebard, Proc. Ac. Nat. Sci. Philad., lxxiv, p. 227.

1 ♀ larvae from Mt. Dulit.

MACROXIPHUS VARIPES n. sp.

♀. Reddish brown. Scrobes of antennae unicolorous, second segment only a little darker at base. Head as in *pictipes*. Hind margin of pronotum not black. Basal part of tegmina near fore margin slightly greenish, the remainder yellowish brown with dark spots in the same manner as in *pictipes*. Sides of meso- and metathorax (above the insertion of legs) blackish; breast concolorous with the body, not



Fig. 8. ♀ subgenital plate of *Macroxiphus pictipes* (left) and *M. varipes* (right). Enlarged.

black. Legs spined and coloured as in *pictipes*, middle and hind knees black. Subgenital plate (♀) less narrowed towards the apex than in *pictipes*, at the end more broadly excised. Ovipositor not overreaching the end of tegmina.

Measurements: Length of body 35 mm. of pronotum 9.5 mm. of tegmina 53 mm. of hind femora 27.5 mm. of ovipositor 33 mm.

1 ♀ from Kalabit Country, Tamabo.

This new species belongs to the *pictipes-megapterus*-group, having the fore femora spined on both edges. Griffini (1908) stated that *M. pictipes* and *M. megapterus* are identical, and I am following him in "Genera Insectorum" (1912). Recently Hebard says that he also concurs with this opinion (1922). In every case, these two species are very closely related to each other, but according to the original descriptions they differ in the shape of ♀ subgenital plate which is in *M. megapterus* (according to Brongniart) "apice truncate haud excisa," in *pictipes* "attenuata, apice triangulariter excise" (Dohrn). The ♂ of *M. megapterus* was unknown to Brongniart, but Hebard described the ♂ genitalia: Dohrn, however, stated for the male cerci, "apice bifidi, subtus in medio dente brevi acuto instructi." There appears to

be some inaccuracy here, as the males before us, though agreeing closely in other respects, have the strongly incurved cerci bidentate distad and, though unarmed ventrad, bearing mesad on the dorso-external margin a stout, uncinatè tooth, directed caudad. A ♀ from Dutch N. Borneo in the collection of Buitenzorg Museum agrees perfectly with Dohrn's description of *M. pictipes*, whilst a ♂ from the same locality has the cerci as described by Hebard. Thus I am not quite sure whether the two species are different, or the description of Brongniart's ♀ and that of Dohrn's ♂ is inadequate. In every case, my ♀ of *M. varipes* differs from Brongniart's description by the shape of subgenital plate, coming nearer to *M. pictipes* in this character. But the shape of this plate is also not the same as in the *M. pictipes* ♀ of Buitenzorg Museum (fig. 8). *M. varipes* differs, moreover, also by its much shorter ovipositor and by the pale sterna. The ovipositor seems not to be mutilated in the only specimen before me, but it should be possible that it were a character of less specific value, because the ovipositor may perhaps be a regenerate in consequence of a mutilation during the larval stage. In the collection of Buitenzorg Museum there is also a ♀ of *M. acroxiphus* from Dutch N. Borneo agreeing in all other characters entirely with the true *M. pictipes* and differing thereby from *M. varipes*, but having the ovipositor not longer than this latter species.

SUBFAM. COPIPHORINAE.

EUMEGALODON Brongniart.

Karny, Journ. R. As. Soc., Mal. Br., 87, 1923, p. 187 (with list of literature).

EUMEGALODON INTERMEDIUS Karny.

1923. Karny, l. c., p. 189.

1 ♀ from Mt. Murud, 5500 feet, differing from the type specimen by the second pronotal projection somewhat more pointed, by the anal field of tegmina and base of chief veins bright verdigris green, by the spines on upper side of fore femora much shorter, those of middle femora entirely wanting, and by its somewhat smaller size, viz., length of body 46 mm. of pronotum 18 mm. of tegmina 53.5 mm. of hind femora 28 mm. of ovipositor 31 mm.

VI.—On some Cricket-Locusts (Gryllacridae) from Mt. Dulit and Mt. Murud, Sarawak. By H. H. KARNY, Buitenzorg, Java.

(With one Plate.)

SUBFAM. STENOPELMATINAE.

SIA FEROX Giebel.

1861. Giebel, Zeitschr. Naturw., xviii, p. 116.

1922. Hebard, Proc. Ac. Nat. Sci. Philad., lxxiv, p. 286 (*Bugajus couloni*).

1924. Karny, Treubia, v, 1--3, p. 32 (with list of literature).

1 larva (dried) from Tutau River; 1 larva (in alcohol) from Mt. Dulit, 4000 feet, leg. Dr. E. Mjöberg.

SUBFAM. RHAPHIDOPHORINAE.

RHAPHIDOPHORA CHOPARDI Karny.

1924. Karny, Treubia, v, 1--3, p. 40.

1 ♂ from Mt. Dulit.

SUBFAM. GRYLLACRINAE.

GRYLLACRIS TEUTHROIDES n. sp. (Plate 2, fig. 1).

♂. Size moderately large and very slender. Tawny-brown. Head practically concolorous, narrowly ovate when seen in front. Forehead depressed below, densely set with stiff hairs and, especially in lower part, with some longer bristles. Occiput and vertex strongly arched; fastigium slightly depressed in front with somewhat protruding lateral margins; without ocellar spots.

Pronotum yellowish-brown, much darker along either side of disc. Fore and hind margin truncate. Lateral lobes not high, little raised; fore angle rounded, lower margin slightly descending backwards, hind angle truncated, hind margin slightly excavated. U-shaped sulcus and the oblique hind one well marked, broad and rather shallow; space between strongly

arched. Longitudinal furrow of pronotum forming a sharp, distinctly marked line. Cross sulci hardly perceptible.

Tegmina twice as long as the whole body, moderately broad, brownish; basal half along the fore margin somewhat more hyaline. All veins tawny. Venation according to type I. 4 praecostals; costa and subcosta simple, the area between them not wider than the subcostal area before the middle; this latter one distinctly narrowed distad from the middle. Radial vein simple; radial sector arising in the middle of tegminal length, simply forked; fork branches about twice as long as the fork shaft. Medial vein very approximated to radial stem in basal part, but not united therewith, then emitting an oblique cross vein against cubital fore branch, further remaining simple throughout. Cubital vein forked at the end of basal fourth of tegminal length; fore branch then receiving the oblique cross vein from media, then simply forked again till before the end of basal third of tegminal length; hind branch of chief fork remaining simple. 4 anals (incl. Cus.), the last one forked near base. Hind wings practically hyaline.

Legs tawny. Fore and middle tibiae with 5 pairs of extraordinarily long, movable spines (fig. 1a); spines of first (basal) pair about one-third of tibial length, on fore tibiae a

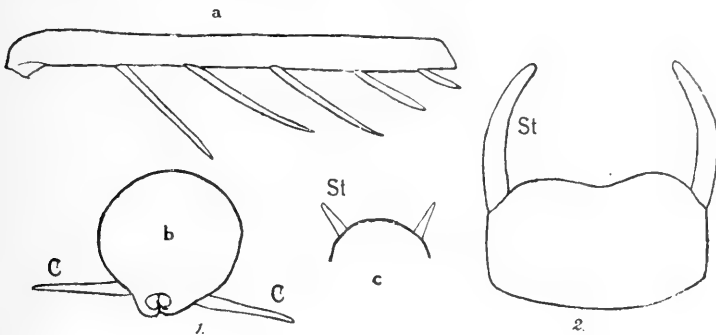


Fig. 1. *Gryllacris teuthroides* ♂. a, middle tibia; b, last tergite as seen from behind; c, subgenital plate. Fig. 2. ♂ subgenital plate of *Gryllacris mjöbergi*.

little longer, on middle tibiae a little shorter; those of last (apical) pair short, inserted near the apex. Hind femora with slightly darker spines, 9 on outer, 7 on inner margin. Hind tibiae above with 6 darker spines on either edge.

Eighth tergite fully twice as long as the preceding one; ninth (fig. 1b) strongly arched, with two strongly incurved spines beneath apex. Cerci moderately long, densely haired. Subgenital plate (fig. 1c) semi-circularly rounded at apical margin, by no means excised; styles short, conical, hardly one-third of cercal length.

♂. Length of body 17 mm., pronotum 3.7 mm., tegmina 34 mm., fore femora 7 mm., hind femora 13.5 mm.

1 ♂ from Mt. Dulit.

Belonging to the *phryganoides-arctata*-group, differing from all the hitherto known species of this group by the shape of ♂ subgenital plate. In colour and general appearance similar to *G. sphegidiprueda* Karny, but differing from it by its larger size and especially by the longer tegmina. In this latter respect resembling *G. phryganoides* De Haan, from which it differs by its darker colour, especially along the discal sides, and by the narrower tegmina. Spines of fore and middle tibiae, finally, also being longer than in all the hitherto known species of this group.

GRYLLACRIS ATRATA Walker.

To this species belongs probably 1 ♀ larva from Mt. Dulit, as it is suggested by the colour of legs. This larva has, however, the forehead darker, reddish castaneous, and the fastigia furnished with distinct, yellow ocellar spots, the lower one being ovate, higher than broad, the two upper ones a little shorter and especially very much narrower. If this should not be a merely larval character, the specimen might belong perhaps to a new local race, characterized by the described coloration characters. This cannot be decided, naturally, from a larval specimen only.

GRYLLACRIS FASCICULATA *rotundata* n. subsp. (Plate 2, fig. 2).

Differing from the typical species especially by the much more rounded, nearly cycloid hind wings which are only one-third longer than wide, whilst in the typical species (comp. Karny, *Treubia*, v, 1-3, p. 68, 233) "presque une fois et demie plus longues que larges" (Pictet and Saussure, 1896). In the typical species the pale cross veins are bordered by sharp, red cross bands, the remaining part of cells whitish hyaline, whilst in *rotundata* the hind wings are more pink coloured (somewhat too red in the coloured figure on plate 5),

this colour becoming gradually paler against the cell centres. Tegmina somewhat wider relatively than in the typical species. Fore knees blackish, the others pale; all tibiae bright yellow with a verdigris green hue, blackish at apex; tarsi also dark. Head and pronotum practically concolorous, below the eyes along subocular sulci the genae somewhat darker.

♂. Length of body 25 mm., pronotum 7 mm., tegmina 38 mm. width 12.7 mm., hind wings 37 mm. width 28 mm., fore femora 9.7 mm., hind femora 17.4 mm.

1 ♂ from Mt. Murud, 6000 feet.

GRYLLACRIS MJÖBERGI n. sp. (Plate 2, fig. 3, 3a).

♂. Size rather small, moderately stout. General colour brownish-yellow, mouth parts black, pronotum with black markings, fore knees black.

Head ovate, as seen in front; occiput and vertex arched. Fastigium of the latter hardly wider than the first antennal joint, slightly excavate, with somewhat protruding lateral margins, surface with some faintly impressed dots. Three ocellar spots visible, pale yellow, not well defined, the lower one about twice as large as the narrow upper ones. Cross furrow between fastigium frontis and verticis distinct. Forehead roughened by strong, impressed dots, tawny brown, broadly bordered with shining black along clypeal margin. Genae, clypeus, labrum and mandibles also shining black (not dark enough in fig. 3a on plate 2). Clypeus and labrum also with impressed dots. Clypeus with a pale yellow spot on either distal angle. Mandibles sharply pointed, distinctly overreaching the end of labrum. Palpi pale brownish-yellow. Antennae unicolorous, tawny yellow.

Pronotum scarcely as long as wide, as seen from above, pale brownish-yellow, blackish bordered all around all margins, with sharp black markings arranged in the same manner as in *G. signifera* (Stoll), *G. modiglianii* Griffini and *G. griffinii* Karny. Fore margin rounded, slightly produced in the middle. Anterior cross sulcus very shallow, wide; median length sulcus faintly impressed, well defined; hind margin truncate. Lateral lobes little raised, much longer than high, fore and hind angles rounded; lower margin distinctly descending backwards, slightly sinuated; hind margin slightly rounded,

nearly straight, without humeral sinus. Sulci of lateral lobes well impressed, space between them strongly arched.

Tegmina scarcely overreaching the hind knees, pale yellowish, veins tawny (except the praecostals). Venation according to type IV. 3 or 4 dark brown praecostals. Costal vein simple, costal area distinctly widened distad. Subcostal vein simply forked close before the tip; subcostal area scarcely half as wide as the costal one in distal part. Radial vein and radial sector each simply forked close before the end; sector arising from radial stem about in the middle of tegminal length. Medial vein simple, arising from radial stem in the middle between tegminal base and sector base (on right tegmen) or nearer to the latter (on left tegmen). Cubital vein simply forked basad (on right tegmen) or distad from the middle (on left tegmen). 5 anals (incl. Cus), the two last ones with a very short common stem, the last one ending already before the middle of tegminal length.

Hind wings strongly cycloid, dark blackish-grey in basal part, bright orange-yellow with dark bands along cross veins distad; these cross bands well defined, becoming gradually narrower towards the outer margin, practically wanting along fore margin.

Legs stout, moderately long, tawny; fore knees broadly black, middle and hind legs practically unicolorous, with a very fine single dark line along the knee joint. Fore and middle tibiae each with 5 pairs of very long, concolorous, movable spines. Hind femora on outer margin with 6--7, on inner one with 8--10, small, dark spines; hind tibiae outside with 6, inside with 5--6 dark spines.

Abdomen pale brownish-yellow, concolorous apical parts scarcely darker. Eighth segment strongly produced, about three times as long as the preceding one, length 3.5 mm. Ninth segment shorter than the eighth, in basal part descending backwards, then angulated and descending forwards, in this subvertical region with a fine median sulcus more strongly impressed in its lower part; apical margin emarginate, with arched, rounded lobes; no spines visible, perhaps obstructed by the subgenital plate. Cerci moderately long and stout, strongly pilose, about as long as the eighth segment. Subgenital plate (fig. 2) broadly emarginated in the middle of hind margin, with rounded lobes; styles inserted laterad, slender, not quite half as long as the cerci.

Length of body 20.5 mm., pronotum 5.2 mm., tegmina 20.5 mm. width 6.7 mm., fore femora 8 mm., hind femora 23.8 mm.

1 ♂ from Mt. Dulit.

I have the pleasure in naming this beautiful new species after its discoverer, the famous Swedish Entomologist, Dr. Eric Mjöberg.

Seems to come nearest to *G. moultoni* and *G. dayaka* amongst the Bornean species; further related also with the Sumatran and Malaccan species of the *modiglianii-griffinii*-group. Differing from all these already at first view by the bright colour of hind wings. End of ♂ abdomen also different from the hitherto known ♂ (comp. Treubia, v, 1--3, p. 226, fig. 84).

GRYLLACRIS PUMILA n. sp. (Plate 2, fig. 4, 4a).

♀. Very near in size and general appearance to *G. hanitschi* Karny from Southern Sumatra, but differing by the following characters:—

Occiput with a curved shining black cross band in its anterior region; from this band arise two length bands of the same colour which are produced till fastigium of vertex, separated from another by a very narrow, pale median line. Cross sulcus between fastigium verticis and frontis black; inner margins of antennal scrobes also blackish bordered, this colour being produced upon forehead into comma-shaped stripes which are convex against the middle line (all these markings much darker than in fig. 4a on plate 5). Genae not darker than forehead; labrum and mandibles slightly darkened. Antennae pale greyish testaceous throughout. Fastigium of vertex narrow, about $1\frac{1}{2}$ times as wide as the first antennal joint, with slightly protruding lateral margins. Clypeus wider and less high than in *hanitschi*.

Pronotum pale greyish-yellow, bordered as in *G. hanitschi* with shining black along all margins except the middle of fore and hind margin of disc. Black markings well defined, arranged like in *G. signifera*: a short black length line in the middle of disc; 7-shaped marking very narrow behind, strongly widened in front; the U-shaped sulcus of lateral lobes broadly bordered with blackish above along its whole length, then this black stripe angulated behind above and produced backwards along the sides of disc.

Tegmina hyaline in praecostal area, then darker, behind subcosta shining black by reflected light, dark grey-brown by transmitted light, tipwards becoming gradually paler, hyaline in apical region. All veins dark, blackish-brown. Venation practically as in *G. hanitschi* (Va.) 2 praecostals. Costa simple, costal area widened in distal part, about twice as wide as the subcostal area. Subcosta simply forked close before its end. Radial vein simple or simply forked close before the tip. Radial sector simply forked. Following veins simple. 5 anals (incl. Cus), all simple. Hind wings cycloid, greyish hyaline, with dark veins.

All femora at their tips and all tibial bases blackish. Spines of hind femora as in the Benkalen-specimen of *G. hanitschi*. Hind tibiae with 4 blackish spines inside, 5-6 outside.

Abdomen pale tawny-greyish, practically unicolorous. ♀ subgenital plate very regular, semi-circular. Ovipositor short, slightly curved, sharply pointed at tip.

♂. Length of body 13.5 mm., pronotum 3.7 mm., tegmina 13.5 mm., width 4.5 mm., fore femora 4.7 mm., hind femora 9.3 mm., ovipositor 6.2 mm.

1 ♀ from Nota Ragong, 17. 18. X.

Differing from *G. hanitschi* especially by the coloration of head and pronotum, and by the tegmina basad black, distad hyaline, whilst they are uniformly pale reddish-brown in *G. hanitschi*.

To the same species belongs perhaps also one larva from the same locality with black hind wing cases; dark coloration on pronotum very indistinct, nebulous, on knees scarcely perceptible, on head none at all.

NEANIAS (EREMUS) BORNEENSIS n. sp.

♀. Shining brown, legs somewhat paler. Size moderately large and stout. Head scarcely wider than pronotum, ovate as seen in front. Occiput and vertex strongly convex; fastigium verticis somewhat less convex, with blunt lateral margins, fully twice as wide as the first antennal joint. Subocular sulci distinct throughout their whole length, shallow, strongly widened downwards. Forehead shining, without distinct dots. Labrum ovate, a little higher than wide.

Colour of head unicolorous tawny-brown, fastigium of vertex nebulosely darkened along its lower margin. No ocellar spots. Clypeus and mandibles paler, brownish-yellow, the

latter ones faintly blackish bordered along outer margin. Labrum darkened. 1st and 2nd antennal joint yellowish, the others uniformly tawny.

Pronotum unicolorous, scarcely as long as wide, convex. Fore margin rounded, roundly produced in the middle region. Anterior cross sulcus very shallow, in the middle part hardly visible. Length sulcus shortened, present, but not very distinct. Behind it at either side of disc a circular impressed dimple. Posterior cross sulcus removed from hind margin, very shallow. Hind margin broadly emarginate. Lateral lobes much longer than high, little appressed; fore angle rounded; lower margin slightly rounded, somewhat descending backwards; hind angle roundly truncate; no humeral sinus. U-shaped sulcus and the posterior descending one distinctly impressed; further a S-curved sulcus along lower margin and an oblique one descending from hind margin forwards upon the disc. All spaces between the furrows strongly arched. Meso- and metanotum without any wing-pads, but with thickened lateral margins and thereabove with a longitudinal impression.

Legs concolorous, tawny-yellow, long and stout, pilose especially along lower margins of femora. Fore and middle tibiae furnished with moderately long, movable spines in 5 pairs, the last pair being short, subapical. Hind knees with a darker stripe along the upper margin of genicular lobes; all spines of hind legs with dark tips. Hind femora strongly incrassate basad, outer margin with 4-5 spines in distal half only, inner margin with 8-10 spines arranged along the whole length except the extreme basal part only. Hind tibiae, except the apical spines, with 5 spines on outer, 4 on inner margin.

Abdomen concolorous. ♀ subgenital plate not yet half as long as wide at base, with rounded hind margin, in the middle of which there is a very small, acute, backward directed tooth visible. Ovipositor only a little shorter than the whole body, straight throughout, slender, practically parallel-sided, bluntly pointed at tip.

♀. Length of body 21 mm., pronotum 5 mm., fore femora 7 mm., hind femora 14.2 mm., ovipositor 19.2 mm.

1 ♀ from Mt. Murud, 6500 feet.

Amongst the hitherto known species related with the Javanese *N. jacobsoni* by its broad fastigium verticis, differing

from it, however, by the above given characters. The Malaysian species of *Neanias* may be tabulated as follows:—

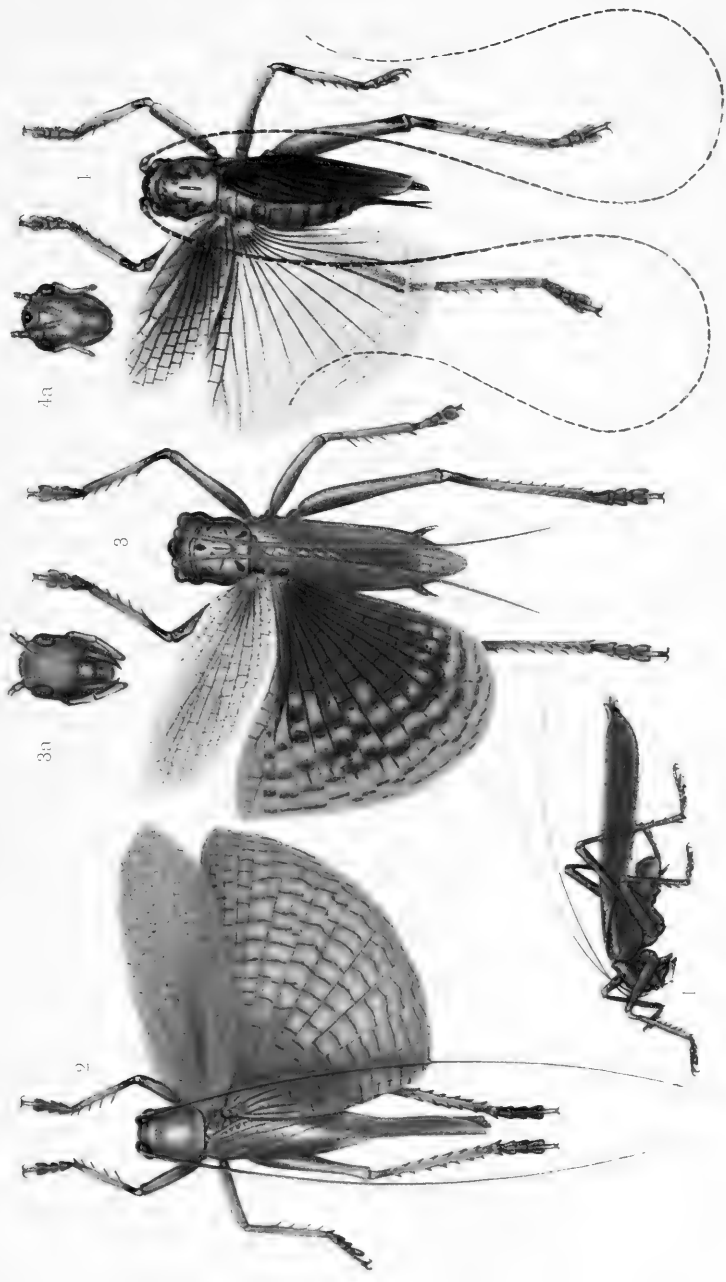
Key to the Malaysian species of Neanias.

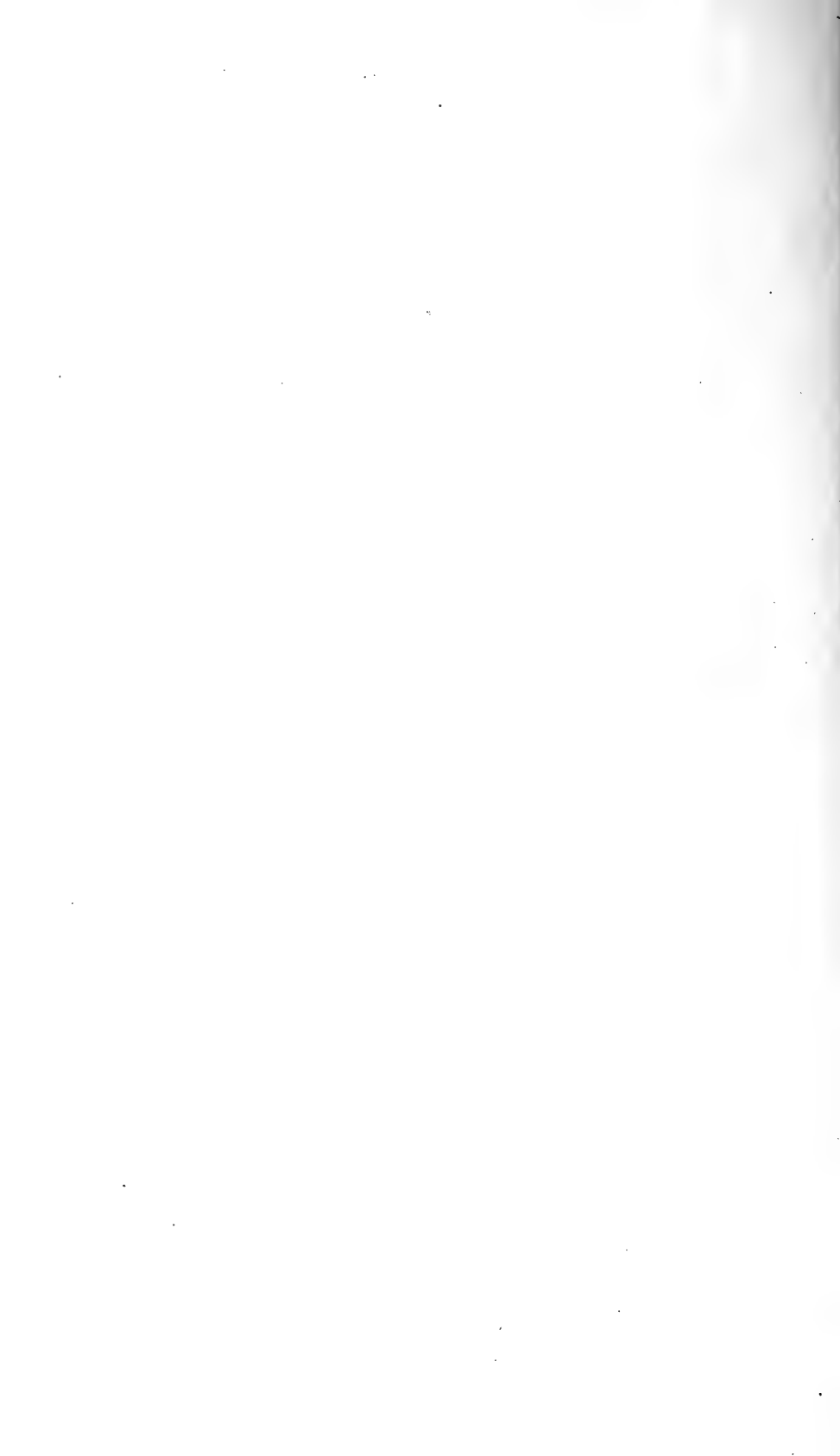
(from Tonkin to New Guinea).

1. Tegmina a little shorter than pronotum, more than 3 mm. long. Subgen. *Neanias* Br.
2. Hind femora with 10 spines on inner, 6-8 on outer margin. ♂ subgenital plate produced in the middle of hind margin into a narrow lobe which is dilated and slightly bilobate at apex. Patria: New Guinea. *N. lobatus* Brunner.
- 2'. Hind femora with 6-7 spines on either margin. ♂ subgenital plate with broadly rounded hind margin. Patria: Benkulen (Sumatra). *N. subapterus* Karny.
- 1'. Tegmina quite vestigial, much shorter than the pronotum, not longer than 1 mm. or quite lacking. Subgen. *Eremus* Br.
2. Fastigium of vertex fully twice as wide as the first antennal joint.
 3. Size smaller. Vestigial tegmina present (♂). Hind femora with 10 spines on outer, 15 on inner margin. Patria: Eastern Java. *N. (E.) jacobsoni* Griff.
 - 3'. Size larger. Tegmina lacking throughout (♀). Hind femora with 4-5 spines on outer, 8-10 on inner margin. Patria: Mt. Murud (Sarawak, Borneo). *N. (E.) borneensis* Karny.
- 2'. Fastigium verticis distinctly less than twice as wide as the first antennal joint.
 3. General colour tawny, darker above, with a distinct pale length band on the thorax and the basal abdominal segments.
 4. Hind femora with 4-5 concolorous spines on either margin. Hind tibiae 4-spined on either margin. Patria: Philippines. *N. (E.) philippinus* Griff.
 - 4'. Spines of hind femora dark at tips. Hind tibiae with 5-8 spines on either margin.
 5. Hind femora with 6-7 spines outside, 8-9 inside. Tegmina 1 mm. long (♀). Patria: Western Java. *N. (E.) javanicus* Karny.
 - 5'. Hind femora with 4 spines on outer, 12 on inner margin. Tegmina 0.3 mm. long (♂). Patria: Tonkin. *N. (E.) fruhstorferi* Griff.
- 3'. General colour testaceous, infuscate above, tipwards black. Antennal scrobes narrowly dark bordered. Hind femora with 8-10 spines on either margin. Patria: China. *N. (E.) fusco-terminatus* Brunner.

Explanation of Plate 2.

- Fig. 1. *Gryllacris teuthroides* n. sp., lateral view, natural size.
 ,, 2. *Gryllacris fasciculata rotundata* n. subsp. dorsal view, natural size.
 ,, 3, 3a. *Gryllacris mjobergi* n. sp. 1½ times enlarged. 3 dorsal view, 3a frontal view of the head.
 ,, 4, 4a. *Gryllacris pumila* n. sp. twice enlarged. 4 dorsal view, 4a frontal view of the head.





VII.—On the Copeognatha from Mt. Murud and Mt. Dulit, Sarawak. By H. H. KARNY, Buitenzorg, Java.

(With one Plate.)

The specimens described below were collected for the Sarawak Museum by Dr. E. Mjöberg on Mts. Murud and Dulit in Northern Sarawak in 1923.

FAMILY MYOPSOCIDAE.

Key to the Genera of Malaysian Myopsocidae.

1. Fore wing along the anal vein turned up into a large sack-like processus *Lophopterygella* Enderlein.
- 1'. Fore wing without an anal sack.
 2. Areola postica connected with medial vein by a short cross vein. Radial sector of hind wings connected with media by a somewhat long cross vein *Lichenomima* Enderlein.
 - 2'. Areola postica broadly united with medial vein.
 3. Radial sector of hind wings broadly united with medial vein *Phlotodes* Enderlein.
 - 3'. Radial sector of hind wings connected with media by a cross vein *Myopsocus* Hagen.

PHLOTODES MJÖBERGI n. sp.

General colour yellow-brown (balsam slide ex alcohol). Maxillary palpi pale, yellowish, black at extreme tip of apical joint. Antennae yellowish, closely beset with stiff hairs, nearly twice as long as the joints are wide. Femora pale brownish-yellow. Tibiae pale yellowish, black at extreme tip; first tarsal joint pale yellowish, second and third ones black. First tarsal joint of hind leg with 26 ctenidia, each of them with 5 teeth; second joint with one, third also with one ctenidium, each of them with 7 teeth. Claws of a similar shape as in *P. kolbei*.

Length of hind tarsal joints: I 0.6 mm., II 0.08 mm., III 0.1 mm.

Fore wing three times as long as wide, rounded at apical margin. General colour hyaline, closely dotted with brown; these dots confluent at some places of wing to larger spots and thus forming an angulate cross band at the end of the basal third of wing, then a spot at the basal half of pterostigma till the branching of media from radial sector, finally a spot at the distal half of areola postica till the branch of medial vein. These spots (and the basal cross band) with very dark margins, surrounded with hyaline, especially along both margins of cross band, and a larger hyaline spot about in the middle of wings, between the fore and hind marginal brown spots. The remainder of wings closely dotted, especially in the apical part and at extreme base of wing. Pterostigma very closely and confluent dotted with brown in basal half, bright yellow in the widened apical half; there bluntly rounded at its hind margin. Radial sector united for some distance with medial vein. Hind wings hyaline, dotted with brown at the fore margin; venation as in *P. kolbei*.

Length of body 3.5 mm.; fore wings 5 mm. long, 1.7 mm. wide.

I have the pleasure of naming this new species after its discoverer, the famous Swedish Entomologist, Dr. Erik Mjöberg.

One specimen from Mt. Murud, 6000--7000 feet, headquarters, collected in October by Dr. E. Mjöberg.

This is the largest hitherto known species of the genus, differing from the New Guinean *P. kolbei*, by the number of hind tarsal ctenidia. The Philippine *P. barkeri* Banks and the New Guinean *P. lorai* Ribaga—if they belong also to the same genus which is not yet quite sure—are also smaller than my Sarawak species and may be further distinguished by a somewhat different coloration of fore wings. The Philippine *P. enderleini* Banks seem to belong to *Lichenomima*—at least so according to a specimen which I owe to the kindness of Prof. Ch. F. Baker.

FAMILY PSOCIDAE.

PSOCUS MURUDENSIS n. sp.

General colour brown (balsam slide ex alcohol); legs somewhat paler, tarsi and the tips of tibiae dark brown. Maxillary palpi very dark, nearly black. Antennae beset with $\frac{1}{4}$ mm. long, stiff, slightly curved bristle-hairs. The two short basal

joints pale brown; the third (i.e., the first long) joint of the same colour, but dark at the tip, the following joints blackish-brown. First joint of hind tarsi with 20, second joint with 4 ctenidia; each ctenidium with about 6 teeth. Claws slender, with a sharp tooth before the apex. Length of hind tarsal joints: I 0.6 mm., II 0.24 mm.

Fore wings (Plate 3) more than three times as long as wide. Radial sector communicating with media for some distance. Areola postica very broadly united with medial vein. Coloration similar as in *P. brioi* Enderlein, *P. mali* Okamoto and especially *P. kurokianus* Enderlein, but not quite agreeing with any of those species (vide fig.). Hind wings hyaline; radial sector united with medial vein for a relatively long distance (about as in *P. kurokianus*, longer than in *P. mali*, shorter than in *P. brioi*).

Length of body 3.4 mm.; fore wings 5 mm. long, 1.5 mm. wide.

One specimen from Mt. Murud, 6000--7000 feet, head camp, coll. E. Mjöberg.

According to the coloration of fore wings and the length and structure of tarsal joints coming between the New Guinean *P. brioi* and the Japanese *P. kurokianus* and *P. mali*. The second joint of hind tarsi is relatively shorter than in both these Japanese species, but longer than in *P. brioi*. Accordingly it has many less ctenidia than in *P. mali* and *P. kurokianus*; in regard to *P. brioi*, Enderlein did not mention their number.

HEMPSOCUS HYALINUS Enderlein.

1906. Enderlein, Stett. Ent. Zeit., p. 311.

1907. Okamoto, Trans. Sap. Nat. Hist. Soc., ii, p. 135.

General colour dark brown, nearly black; pale brown when freshly emerged. The two basal joints of antennae brown, all following ones brownish-black. As Enderlein and Okamoto described the colour as much paler, I think their descriptions may have been based on freshly emerged specimens. I cannot separate the Bornean specimens before me from the Japanese species by reason of these colour differences, because they agree with those in all other respects perfectly. Length of hind tarsal joints: I 0.8 mm., II 0.16 mm. Number of ctenidia as stated by Enderlein. Fore wings hyaline; radial sector communicating with medial vein for a rather short distance. Cross vein between media and areola postica extremely short.

Length of body 3.3 mm.; fore wing 3.4 mm. long, 1.2 mm. wide.

Five specimens from Mt. Dulit, 3000 feet, coll. Dr. Mjöberg; one from Mt. Murud, 6000--7000 feet, head camp, coll. Dr. Mjöberg. The species was known hitherto from Japan only.

FAMILY CAECILIIDAE.

CALOPSOCUS INFELIX (Hagen). (Plate 3, fig. 2).

1858. Hagen, Verh. zool. bot. Ges. Wien, p. 475 (*Psocus*).

1859. Hagen, l. c., p. 204, 205 (*Psocus*).

1866. Hagen, l. c., p. 214.

1903. Enderlein, Ann. Mus. Nat. Hung., i, p. 246.

1904. Enderlein, Zool. Jahrb., Abt. Syst., xx, 2, p. 106.

One specimen from Serambo River (coll. Dr. E. Miöberg) having the upper fork of hind wings (fig. 2), as the Philippine *C. rizali* Banks, much shorter than the lower one, and shorter than in Enderlein's figure of 1903. (Plate VI, fig. 22a).

I place this specimen, nevertheless, near to *C. infelix* as the fore wings are net-veined near the middle only, behind pterostigma, not throughout the whole distal half as they are in *C. rizali* and *C. iridescens*. Moreover, the *C. infelix* specimen from New Britain, figured by Enderlein in 1904 (Plate VII, fig. 1), has also the upper fork on hind wings distinctly shorter than the lower one, and shorter than in Enderlein's figure of 1903. The further details of venation are very variable, as may be seen from comparing the figure given here with those of Enderlein.

Length of body 3.8 mm.; fore wing 4.2 mm. long, 2 mm. wide; length of hind tarsal joints: I 0.52 mm., II 0.15 mm.

EPIPSOCUS NUBILIPENNIS n. sp. (Plate 3, fig. 3).

General colour brown (balsam slides ex alcohol). Legs and antennae paler, yellowish-brown; last tarsal joint (of all legs) and last joint of maxillary palpi dark brown. Antennae closely set with stiff bristle-hairs which are more than twice as long as the joints wide. All tibia very closely set with stiff bristles. First joint of middle tarsi with 24--26 ctenidia, second one with 4; first joint of hind tarsi with 36, second one with 7 ctenidia. Length of hind tarsal joints: I 0.9 mm., II 0.2 mm.

Fore wings (fig. 3) nearly three times as long as wide; margins and veins set with strong bristles. Cross vein between radial sector and medial vein longer than the base of radial sector (from its arising till the cross vein). Radial fork longer than the shaft. Branches of radial sector and media slightly S-curved. Areola postica very long and narrow, scarcely wider than the distance from medial vein. General colour pale brownish, with some larger hyaline spots between the veins and along the apical margin. The brownish colour somewhat darker in four irregular, nebulous bands across the wing. At the marginal ends of all veins a small, dark brown spot. Hind wings very pale yellowish, nearly hyaline, darkened at extreme base, and with a small dark spot at the marginal end of media. Radial sector united with medial vein for a short distance. This distance hardly half as long as the base of media before it; both together about as long as base of radial sector; this arising from radius almost perpendicularly. In one of the six specimens radial sector of hind wings connected with media by a very short cross vein.

Length of body 3.2 mm.; fore wings 4.5 mm. long, 1.6 mm. wide.

Six specimens from Mt. Dulit, 3000 feet, January, by lamp at night, coll. Dr. E. Mjöberg.

This new species resembles somewhat the coloration of fore wings in the New Guinean *E. marginatus* Enderlein and the Philippine *E. completus* Banks but the brownish colour is here more extended than in both these species.

EPISOCUS DUBIUS n. sp.

General colour dark brown (balsam slides ex alcohol). Legs and antennae yellowish-brown. Second tarsal joint not darker than the first one. Maxillary palpi somewhat darkened at extreme apex only. Number of ctenidia: middle tarsi I 24, II 5; hind tarsi I 30, II 6. Length of hind tarsal joints: I 0.85 mm., II 0.2 mm.

Veins of the fore wings as in *E. nubilipennis*. Colour uniformly pale yellowish-brown, without hyaline spots; small dark spots (as in the preceding species) at the end of all veins and in the basal part of pterostigma. Hind wings as in *E. nubilipennis*, but in both the specimens before me radial sector connected with media by a short cross vein.

Length of body 2.5 mm.; fore wings 3.5 mm. long, 1.2 mm. wide.

Two specimens from Mt. Dulit, 3000 feet, January, by lamp at night, coll. Dr. E. Mjöberg. It is not impossible that they represent only a smaller, darker variety of the foregoing species.

CAECILIUS TENUICORNIS n. sp. (Plate 3, fig. 4).

General colour dark brown (balsam slide ex alcohol). Legs paler, brownish-yellow; fore tibiae very dark brown, nearly black (darker than the body). Apical joint of maxillary palpi brownish-black. Antennae scarcely half as thick as in *C. fuscopterus*, very pale, the three basal joints yellow, the following ones more greyish. First joint of hind tarsi with 18 ctenidia, second joint without such. Claws brownish-black, the sharply pointed tip curved and yellow. Length of hind tarsal joints: I 0.85 mm., II 0.12 mm.

Colour of fore wings practically as in the European *C. fuscopterus*, very dark brown, with hyaline length bands along the fore and hind margin. The fore marginal band reaching from base of pterostigma till halfway between the ends of the last branch of radial sector and the first branch of media; this band not reaching the stem of radial sector which is followed anteriorly by dark coloration; interrupted by three narrow, dark cross bands, viz., along the end of pterostigma and along both branches of radial sector; all these three cross bands continued from fore margin till the dark colour of wing surface. Pterostigma yellowish. Medial vein followed anteriorly by a curved, pale stripe in the neighbourhood of the origin of its hind branch. The hind marginal hyaline band following the anal vein, then the hind margin, about as wide as the areola postica, then narrowing to tip and reaching as a very narrow stripe till the end of middle branch of medial vein. Communication between radial sector and media in one fore wing extremely short, nearly a point only, in the other one substituted by a very short cross vein. Branches of radial sector somewhat more perpendicular to the margin than in *C. fuscopterus*, and more widely distant from tip of wing than in that of European species. Their common shaft about one and a half times as long as the branches. Areola postica (fig. 4) much smaller than in *C. fuscopterus*, hardly wider than the distance of medial vein.

Hind wings practically as in *C. fuscopterus*, but the fore branch of radial sector almost perpendicular to the margin. General colour dark greyish (but much paler than the fore

wings), with a hyaline length band along fore margin from about the middle of this margin till the end of the hind branch of radial sector. First branch of radial sector narrowly bordered with greyish on both sides. Anal vein followed by a hyaline stripe.

Length of body 2.7 mm.; fore wings 3.7 mm. long, 1.1 mm. wide.

One specimen from Mt. Dulit, 3000 feet, January, at night (light), coll. Dr. E. Mjöberg.

This species resembles the European *C. fuscopterus*, differing from it chiefly by the thinner, pale antennae, and by the much smaller areola postica. It resembles also *C. javanus*, but has the fork of radial sector much shorter than its stem, and the hind marginal hyaline band produced much further tipwards only reaching to the proximal part of areola postica according to Enderlein. The size of *C. javanus* is much smaller than that of *tenuicornis*, the fore wings being 2.2 mm. long.

CAECILIUS BORNEENSIS n. sp. (Plate 3, fig. 5, above).

General colour dark brown (balsam slide ex alcohol). Maxillary palpi (fig. 5) very dark greyish-brown, darker than body. Apical joint more than twice as long as the preceding one, distad scarcely enlarged. Antennae (fig. 5) short and very thick, distinctly shorter than the fore wing. The two basal joints brown, the following ones very dark grey-brown. Eyes black, globose, very much protruding. Space between them nearly twice as wide as the eyes themselves. Legs about as dark as the body, tibia more greyish-brown; tarsi pale grey-brown. First joint of hind tarsi with 10 ctenidia; second joint a little more than half as long as the first one, without ctenidia.

Length of hind tarsal joints: I 0.22 mm., II 0.12 mm.

Fore wings greyish-brown, with a dark spot in the distal half of pterostigma and behind the hind angle of it; a second one between the base of radial sector and medial vein. Pale, nearly hyaline are: costal cell, a stripe along fore margin of radial cell, a spot behind base of pterostigma, another one at the communication of radial sector and media, a stripe along anal vein, and a spot at the proximal part of areola postica. Pterostigma with a blunt angle behind. Communications between radial sector and media very short, about $\frac{1}{4}$ the length of basal part of Rs. Fork of radial sector much narrower than

in *C. gonostigma*, its common shaft slightly S-curved, about $1\frac{1}{2}$ times or more as long as the fork. Fore branch of medial vein moderately long. Areola postica moderately large, with rounded fore margin, about one and a half times as wide as the distance from medial vein. Anal vein not pubescent.

Hind wings pale greyish, much paler than the fore pair, with a darker, brownish spot along fore margin in basal half, and another one between base of radial sector and medial vein. Basal part of radial sector about one and a half times as long as the communication between this vein and media, and a little shorter than the base of medial vein. Fore branch of radial sector nearly perpendicular to the fore margin (the angle distinctly more than 60°), hind branch almost parallel to the fore margin, about as long as the fork shaft. Media slightly S-curved.

Length of body 2.0 mm.; of antennae 1.7 mm.; fore wings 2.8 mm. long, 0.85 mm. wide.

One specimen from Mt. Murud, 7200 feet, coll. Dr. E. Mjöberg.

This new species comes by the colour of wings and the shape of pterostigma near to the Japanese *C. trigonostigma* Enderlein and the Japanese *C. gonostigma* Enderlein. It differs from both these species by the thick, short, dark antennae, the much less numerous ctenidia of first hind tarsal joint, and by some details of wing venation.

CAECILIUS MJÖBERGI n. sp. (Plate 3, fig. 5, beneath).

In general appearance very similar to the preceding species, but somewhat larger and the coloration of fore wings more distinct. General colour dark, abdomen more yellowish-brown (balsam slide ex alcohol). Maxillary palpi (fig. 5, beneath) pale grey-brown, much paler than the body; apical joint blackish at tip, about one and a half times as long as the preceding joint, distinctly widened distad. Antennae (fig. 5, beneath) longer and more slender than in *C. borneensis*; the two basal joints yellowish-brown, third and fourth somewhat darker, the following ones dark grey-brown. Eyes similar as in the preceding species, but larger and much more approximated to each other. Legs brownish-yellow, paler than body, second tarsal joint and the tip of the first one dark grey-brown. First joint of hind tarsi with 26 ctenidia, three and a half times as long as the second one; this latter without ctenidia. Length of hind tarsal joints: I 0.45 mm., II 0.13 mm.

Coloration of fore wings as in *Fülleborniella singaporensis* (see Enderlein's figure, 1903, Ann. Mus. Nat. Hungar., i, Pl. vii, fig. 36). It differs, however, from this species by the generic character (the entirely wanting cross vein behind pterostigma) and by some other details of wing venation. Fork of radial sector much narrower than in *Fülleborniella*, its fore branch being about one and a half times as long as the marginal space between the branches; common shaft slightly S-curved, about twice as long as the fore branch. Areola postica large, with rounded fore margin, about twice as wide as the distance from medial vein. Hind wings nearly hyaline. Radial vein straight, enclosing with the fore margin a very acute angle, not angulately curved to the fore margin before apex as it is in *F. singaporensis* (see Enderlein's figure). Basal part of radial sector about one and a half times as long as (in *F. singaporensis* shorter than) the communication of this vein with media; base of medial vein about one and a half times as long as that of radial sector. Distal part of media almost parallel to the hind branch of radial sector. Cubital vein shorter than in *F. singaporensis*, very slightly S-curved (much less than in that species).

Length of body 2.5 mm.; of antennae 3.8 mm.; fore wing 3.8 mm. long, 1.35 mm. wide.

I have allowed myself the pleasure of naming this new species in honour of Dr. E. Mjöberg, late Curator of Sarawak Museum.

One specimen from Mt. Murud, 6000--7000 feet, November 14, coll. Dr. E. Mjöberg.

Differing from the preceding species by the more distinct coloration of fore wings, the slender antennae, the shape of last joint of maxillary palpi, the much longer basal joint of hind tarsi set with more numerous ctenidia.

KOLBIA MACULIPENNIS n. sp. (Plate 3, fig. 6).

General colour very dark chestnut-brown, head and thorax nearly blackish (balsam slide ex alcohol). Antennae short and thick, much shorter than the fore wing, dark greyish-brown, set with some bristle hairs, which are about twice as long as the antennae joints are wide. Head closely set with bristles. Eyes globose, protruding, not very large; the distance between them more than twice as wide as the eyes themselves. Legs as dark as the body; tarsi much paler, yellowish-grey. Basal joint of hind tarsi with 11 very small ctenidia; apical joint without such,

Length of hind tarsal joints : I 0.24 mm., II 0.21 mm.

Fore wings more than three times as long as wide, on the veins and on whole surface set with strong bristles (fig. 6); those on margins in two or three rows. General colour brown, with greyish hyaline stripes in the costal and radial cell (this latter except the apical part) and along anal vein, at its end widened to a larger spot; further a greyish hyaline spot at basal part of pterostigma and in the neighbouring part of cell R₁, from here produced as an irregular stripe till the base of areola postica. Finally, the space from fork of radial sector till the base of the branch of medial vein also greyish hyaline. Distal part of pterostigma very dark brown. Hind margin of pterostigma backwards produced almost rectangularly. Communication of radial sector and medial vein shorter than the base of radial sector before it, and this shorter than the basal part of media. Fork of radial sector somewhat narrow, much shorter than the common shaft, which is very slightly S-curved. Areola postica broadly rounded, but not angularly produced as in *Dasypsocus*, about twice as wide as the distance from media; its distal margin almost perpendicular to the hind margin of wing.

Hind wings greyish, darker along fore margin in basal half, then nearly hyaline along fore margin till the end of radial vein, then dark again in surrounding of the fore branch of radial sector. Basal part of radial sector before the communication with media about half as long as the base of medial vein, this as long as the communication. Hind branch of radial sector about as long as the shaft, twice as long as the fore branch; this slightly curved (concave basad) arising in an angle of about 60°, ending at the fore margin almost perpendicularly. Medial and cubital vein slightly S-curved, the latter less than the former.

Length of body 2.2 mm.; of antennae 1.7 mm.; fore wing 2.5 mm. long, 0.7 mm. wide.

One specimen from Mt. Murud, 7200 feet, coll. Dr. E. Mjöberg.

Differing from the hitherto known *Kolbia* species by the spotted fore wings; from *Dasypsocus* by the shape of areola postica, from *Ophiodopelma* by the much less S-curved fork-shaft of radial sector, from *Caecilus* by the strong bristles on veins and on the whole surface of fore wings.

HEMICAECILIUS NIGROGUTTATUS n. sp. (Plate 3, fig. 7).

General colour dark grey-brown (balsam slide ex alcohol). Apical joint of maxillary palpi black. Head and humeral angles of thorax set with about 0.2 mm. long bristles, especially the fore margin of head with very rough bristles. Antennae slender, two-thirds as long as the fore wings; the two basal joints thick, nearly as dark as the body; the following ones very pale yellowish, set with long scrubby bristles (length of bristles 0.15 mm.). Legs as dark as the body, middle part of tibiae very slightly paler. First joint of hind tarsi with 12 ctenidia, second one without such. Length of hind tarsal joints: I 0.25 mm., II 0.10 mm. Apical segments of abdomen set with long bristle-hairs.

Fore wings (fig. 7) almost three times as long as wide, hyaline, with large blackish spots in the centres of cells and along the margins, except the cell distad from pterostigma and that distad from areola postica which are hyaline. All veins, except the anal one, set with long, strong bristles; margins of wing with two or three bristle rows. Communication between radial sector and medial vein only a very little shorter than the basal parts of these veins before it. Fork of radial sector wide and short, its marginal distance between the branches longer than the fore branch; the common stem quite straight, about twice as long as the fore branch. Medial vein two-branched; its stem strongly curved (convex backwards), more than twice as long as the fork; this very small and relatively wide. Areola postica small, with broadly rounded fore margin, hardly wider than the distance from medial vein.

Hind wings pale grey, with a hyaline stripe along the anal vein. Margins set with long bristle-hairs, veins without such. Basal part of medial vein more than twice as long as that of radial sector; communication between both these veins longer than both their bases together. Media distad from communication S-curved. Hind branch of radial sector about as long as the fork-shaft, fore branch scarcely half as long, not quite perpendicular to the fore margin.

Length of body 3.0 mm.; of antennae 1.9 mm.; fore wing 3.0 mm. long, 1.1 mm. wide.

One specimen from Mt. Dulit, 3000 feet, January, at night (light), coll. Dr. E. Mjöberg.

This new species comes by the two-branched medial vein of fore wings to the genus *Hemicaecilius*, and differs from all the hitherto known species of this genus by the strongly blackish

spotted fore wings. As to the wing venation, it comes nearest to *H. suzukii* Okamoto, differing from *H. limbatus* Enderlein by the shorter fork of radial sector and the smaller areola postica. It is the first species of the genus known from the Malaysian region.

PERIPSOCUS IGNIS Okamoto.

1910. Okamoto, Ann. Mus. Nat. Hungar., viii, p. 189, Plate iii, fig. 2.

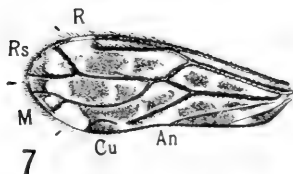
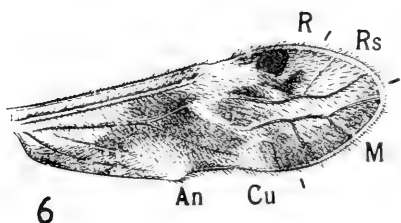
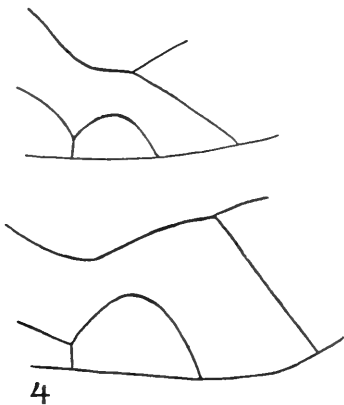
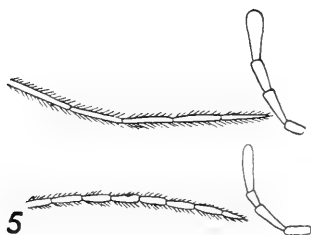
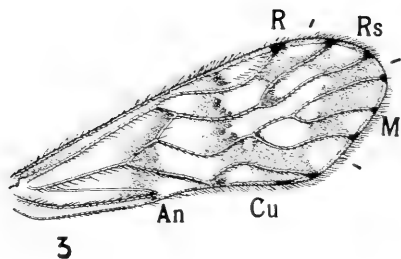
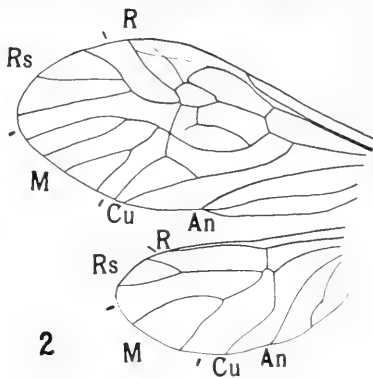
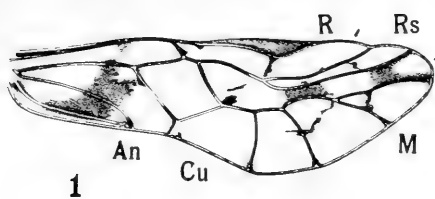
I place as this Japanese species one specimen from Mt. Murud (6000--7000 feet, headquarters, October, coll. Dr. E. Mjöberg) which differs very slightly only from Okamoto's figure and description. Fore and middle femora pale, yellowish; tibiae very dark, almost black. Hind legs more uniformly coloured. Ctenidia as described by Okamoto. Fore wings with a very indistinct paler cross-band from base of pterostigma till the end of cubital vein, and a little paler along anal vein.

Length of body 2.4 mm.; of antennae 1.9 mm.; fore wings 2.9 mm. long, 1.0 mm. wide. Length of hind tarsal joints: I 0.26 mm., II 0.11 mm.

The species was known hitherto from Japan only (Ochiai, Isle of Yezo).

Explanation of Plate 3.

- Fig. 1. Fore wing of *Psocus murudensis* n. sp.
 „ 2. Wing venation of *Calopsocus infelix* Hagen.
 „ 3. Fore wing of *Epipsocus nubilipennis* n. sp.
 „ 4. Areola postica of *Caecilius tenuicornis* n. sp. from Mt. Dulit (above) and *C. fuscopterus* from Central Europe (beneath)
 „ 5. *Caecilius mjobergi* n. sp. (above) and *C. borneensis* n. sp. (beneath). End of antennae (left) and maxillary palpi (right).
 „ 6. Fore wing of *Kolbia maculipennis* n. sp.
 „ 7. Fore wing of *Haemocaecilius nigroguttatus* n. sp.





VIII.—On a Collection of Blattidae from Northern Sarawak, chiefly Mt. Murud and Mt. Dulit. By R. HANITSCH, PH.D.

This collection of Blattidae from Northern Sarawak, chiefly from Mt. Murud and Mt. Dulit, made by Dr. E. Mjöberg between October 1922 and January 1923, includes many novelties, as was to be expected from a part of the country so little explored. Out of 55 species obtained, no fewer than 24 have proved new to science, and 7 species form new records for Borneo, viz., *Hemithyrsocera palliata* Fab., *Anaplecta malayensis* Shelford, *A. obscura* Shelford, *Phyllodromia contigua* Walker, *Epilampra circumdata* Hanitsch, *Catara minor* Krauss, and *Panesthia sinuata* Saussure. Also one new genus, *Ctenoneura* (subfam. Corydinae) has had to be established. The collection is also remarkable for the almost entire absence of cosmopolitan forms. Though the ubiquitous *Phyllodromia germanica* L. is represented by three specimens from Mt. Dulit, it was almost a matter of relief that *Blatta orientalis* L., *Stylopyga rhombifolia* Stoll, *Periplaneta americana* L., *P. australasiae* Fab., *Leucophaea surinamensis* L., *Nauphoeta cinerea* Olivier, etc., were not met with, the explanation, no doubt, being that the white man with these hangers-on to civilization had not yet penetrated into these regions. Of the species described here for the first time, the largest and most beautiful form is *Morphna mjobergi*, of which no fewer than 13 specimens were taken on Mt. Dulit. It is a remarkable fact that an insect so striking and apparently common in that locality, should have escaped notice so long, due either to its very restricted occurrence, or to the country having been so little explored yet.

In my two papers on "Malayan Blattidae"* I gave particulars as to the number and distribution of the described

*Part I, Journal, Straits Branch, R. Asiatic Society, No. 69, pp. 17--178, 7 plates (1915); Part II, Journal, Malayan Branch, R. Asiatic Society, Vol. I, pp. 393--474, 2 plates (1923).

species within the Malayan sub-region—Malay Peninsula, Sumatra, Java and Borneo. The present collection brings the number of Bornean species to 146, that of the sub-region to 258.

The Blattidae are generally classified into 11 sub-families, two of which, the Nyctiborinae and Blaberinae, are restricted to the New World. Of the nine remaining sub-families all are represented in the present collection, with the exception of the Panchlorinae, the Malayan members of which are mainly the above-mentioned cosmopolitan species of *Leucophaea* and *Nauphoeta*.

Figs. 6, 7, 15 and 17 were drawn for me by Mr. V. Knight, to whom I herewith offer my best thanks; the others by myself.

The types here described are, with permission of the Sarawak Museum, preserved in the Hope Department, University Museum, Oxford, where I have worked out the collection, and I take this opportunity of expressing my sincerest thanks to Professor Poulton, F.R.S., for kindly allowing me to continue my study of this group in his Department.

LIST OF THE BLATTIDAE OBTAINED.

SUBFAM. 1. ECTOBINAE.

- Theganopteryx apicigera* Walker.
Hemithyrsocera palliata Fab.
Anaplecta borneensis Shelford.
 „ *malayensis* Shelford.
 „ *obscura* Shelford.
 „ *cornea* n. sp.
 „ *maculifera* n. sp.
 „ *transversa* n. sp.

SUBFAM. 2. PHYLLODROMIINAE.

- Ischnoptera falcifera* n. sp.
Phyllodromia contigua Walker.
 „ *germanica* L.
 „ *hamifera* Walker.
 „ *hewitti* Shelford.
 „ *irregulariter-vittata* Brunner.
 „ *longe-alata* Brunner.
 „ *obtusifrons* Walker.

- Phyllodromia confluens* n. sp.
 ,, *crucifera* n. sp.
 ,, *cunei-vittata* n. sp.
 ,, *interrupta* n. sp.
 ,, *luteo-maculata* n. sp.
 ,, *nigro-vittata* n. sp.

Duryodana palpalis Walker.

Pseudophyllodromia laticeps Walker.

,, *pulcherrima* Shelford.

Allacta microptera n. sp.

SUBFAM. 3. NYCTIBORINAE.

None (New World forms).

SUBFAM. 4. EPILAMPRINAE.

Morphna mjöbergi n. sp.

Pseudophoraspis testudinaria n. sp.

Rhabdoblatta procera Brunner.

Epilampra circumdata Hanitsch.

,, *lurida* Burmeister.

,, *plena* Walker.

,, *intermedia* n. sp.

,, *unicolor* n. sp.

Rhcnoda rugosa Brunner.

SUBFAM. 5. BLATTINAE.

Methana pallipalpis Serville.

Dorylaea atro-caput n. sp.

Blatta concinna De Haan.

Periplaneta lata Herbst.

,, *nivei-palpis* n. sp.

,, *succinea* n. sp.

Catara rugosicollis Brunner.

,, *minor* Krauss.

Protagonista fusca n. sp.

SUBFAM. 6. PANCHLORINAE.

None.

SUBFAM. 7. BLABERINAE.

None (New World forms).

SUBFAM. 8. CORYDINAE.

- Homopteroidea shelfordi* n. sp.
Ctenoneura fulva n. g. and sp.
 „ *major* n. g. and sp.
Dyscologomia cesticulata Saussure.

SUBFAM. 9. OXYHALOINAE.

- Diploptera bicolor* n. sp.
 „ *maculata* n. sp.

SUBFAM. 10. PERISPHAERINAE.

- Paranauphoeta lyrata* Burmeister.
Pseudoglomeris flavicornis Burmeister.

SUBFAM. 11. PANESTHINAE.

- Salganea morio* Burmeister.
Panesthia javanica Serville.
 „ *sinuata* Saussure.

SUBFAM. 1. ECTOBINAE.

THEGANOPTERYX APICIGERA Walker.

1 ♀ Mt. Dulit; 1 ♀ Pah Trap.

The two examples obtained show well the variation in colour of this species. The one, from Mt. Dulit, has the pronotum shining black and the tegmina reddish brown, with black tips. The other, from Pah Trap, has the pronotum yellowish testaceous and the tegmina of the same colour, with black tips.

HEMITHYRSOCERA PALLIATA Fab.

1 ♀ Mt. Dulit.

This widely distributed species, known from Ceylon, India, China, Indo-China, Lower Siam, the Malay Peninsula and Sumatra, is now for the first time recorded from Borneo.

ANAPLECTA BORNEENSIS Shelford.

2 ♀ Mt. Dulit.

First described from Kuching, Sarawak, the type being in the Oxford Museum.

ANAPLECTA MALAYENSIS Shelford.

1 ♀ Mt. Murud, 6500 feet.

Total length 7 mm. Shelford described this species from examples from the Malay Peninsula in the Paris Museum, one of which is now in the Oxford Museum. Mr. V. Knight took a specimen at Kota Tinggi, Johore, August 1917. This is now the first record for Borneo.

ANAPLECTA OBSCURA Shelford.

1 specimen (sex ?), Kalabit country, 3000 feet.

Total length 4 mm. This is only the second example of this species known, the type, from the Malay Peninsula, collected by E. de la Croix and P. Chape, 1899, being in the Paris Museum. Though the specimen from Kalabit is broken, yet tegmina and wings are in perfect condition, and the wings show very distinctly the great reduction in venation, as described and figured by Shelford.

ANAPLECTA CORNEA n. sp.

♂. Head orange; antennae fuscous, at least as long as the body. Pronotum oval, disk amber-coloured, sides hyaline. Tegmina amber, 7 costals, ulnar vein bifurcate, its two branches parallel to each other. Wings dark fuscous, 6 costals, all, except the last one, joined at their bases by transverse venules; medio-discal field crossed by 6 transverse venules; two transverse venules distally connecting the median with

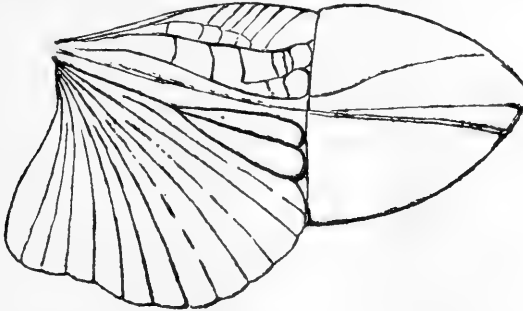


Fig. 1. *Anaplecta cornea* n. sp. Mt. Dulit. Right wing $\times 6\frac{2}{3}$.

the ulnar vein; first axillary tri-ramose; apical area two-fifths of total wing length. Abdomen below yellowish fuscous, supra-anal lamina entire, ciliated; subgenital lamina large,

rounded, entire, not ciliated; cerci orange; styles distinct. Legs orange.

♂. Total length 9 mm.

Hab. 1 ♂ Mt. Murud, 6500 feet; 2 ♂ Mt. Dulit.

Allied to *A. fulva* Brunner, from the Kareen Mts., from Bhamo, Upper Burma, and Tenasserim (Ann. Mus. Civ. Genova, (2), xiii, p. 12, (1893)), which differs from *A. cornea* chiefly by its smaller size, viz., ♂ 6.2 mm.; in total length, and by its subgenital lamina being bilobed.

ANAPLECTA MACULIFERA n. sp.

♂ and ♀. Head rufous-castaneous; antennae fuscous, as long as the body. Pronotum circular, castaneous, a large testaceous macula behind the centre, lateral margins hyaline. Tegmina castaneous; anterior margin yellowish, mediastinal area hyaline, 9 costals. Wings dark fuscous, 7 costals, all except the last one, joined at their bases by transverse venules; medio-discal field crossed by 6 transverse venules; two transverse venules distally connecting the median with the ulnar vein; first axillary tri-ramose; apical area two-fifths of total wing-length. Abdomen below dark testaceous, legs and cerci light testaceous.

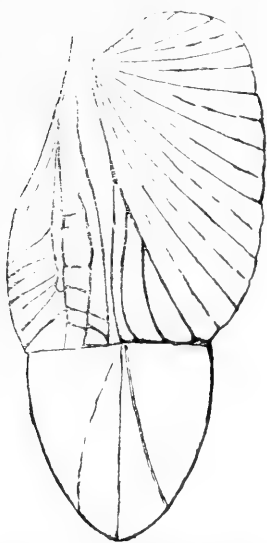


Fig. 2. *Anaplecta maculifera* n. sp. Mt. Murud, 6500 feet. Left wing $\times 6\frac{2}{3}$.

Posterior border of sub-genital lamina ciliated.

♂ and ♀. Total length 7.5 mm.; tegmina 6 mm.

Hab. Numerous ♂ and ♀ specimens, Mt. Murud, 6500 feet.

Closely resembles *A. maculata* Shelford, from Ceylon (Trans. Ent. Soc., 1906, p. 240, pl. xv, fig. 7) by its castaneous colour, the markings of the pronotum, and by the venation, in general, both of tegmina and wings, but differs from it by the number of the costals of the tegmina, viz., 9 instead of 7, and of the wings, viz., 7 instead of 5. The two species are also closely allied to *A. cornea* and *A. fulva*.

ANAPLECTA TRANSVERSA n. sp.

♀. Head reddish-testaceous, shining; antennae fuscous, at least as long as the body. Pronotum circular, anterior half of disk fuscous, posterior half testaceous, lateral margins hyaline. Tegmina reaching to the end of the abdomen, fusco-testaceous, with the anterior margin amber-coloured and semi-transparent, an ill-defined transverse vitta at one-third of their total length, of the same colour; 8 costals. Wings fuscous, with 6 costals, of which only the first three are connected at their bases by transverse venules; medio-discal field crossed by 7 transverse venules; two transverse venules distally connecting the median with the ulnar vein; first axillary tri-ramose; apical area two-fifths of the total wing length. Abdomen below, legs and cerci, pale testaceous.

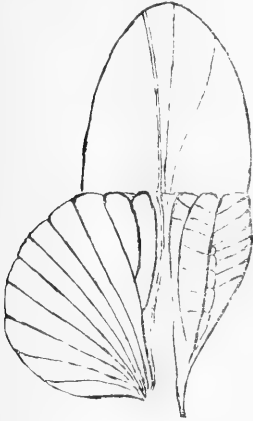


Fig. 3. *Anaplecta transversa* n. sp. Mt. Dulit. Left wing $\times 6\frac{2}{3}$.

♀. Total length 7 mm.; tegmina 5.5 mm.

Hab. 2 ♀ Mt. Dulit.

SUBFAM. 2. PHYLLODROMIINAE.

ISCHNOPTERA FALCIFERA* n. sp.

♂. Head not covered by the pronotum; vertex dark castaneous, with a few faint longitudinal lines; front testaceous, a dark spot in its centre. Antennae fuscous, exceeding the tegmina. Pronotum trapezoidal, posteriorly slightly produced; disk testaceous, with two pairs of black hook-like markings, the smaller pair anterior, the larger pair posterior, all encircled by a black irregular ring of varying width, slightly open in front; margin testaceous, broad in front and at the sides, narrow behind. Tegmina much exceeding the body, testaceous,

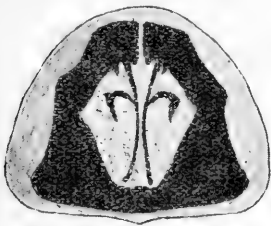


Fig. 4. *Ischnoptera falcifera* n. sp. ♂, Mt. Dulit. Pronotum $\times 8$.

*From the hook-like markings on the pronotum.

23 costals, 8 discoidal sectors. Wings fuscous; mediastinal vein with 5 branches; mediastinal area opaque; radial vein bifurcate, outer half, with 11 costals, inner half near its end breaking up into 6 small branches terminating in the apex

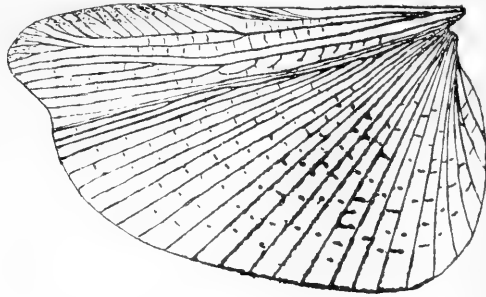


Fig. 5. *Ischnoptera falcifera* n. sp. ♂, Mt. Dulit. Left wing $\times 5$.

of the wings; radial area opaque, proximally dark brown, distally light brown; median vein simple; ulnar vein with 3 large branches terminating just below the apex of the wing, and with about 7 small venules towards the dividing vein; apical triangle small.

♂. Total length 21 mm.; body 15 mm.; pronotum 4×5 mm.; tegmina 16.5 mm.

Hab. 2 ♂ Mt. Dulit; 1 ♂ Kalabit country, 3000 feet. Mr. V. Knight took a ♀ example at Kota Tinggi, Johore, August 1917.

PHYLLODROMIA CONTIGUA Walker.

Blatta contigua Walker, Cat. Blatt. B.M., p. 228, (1868).

1 ♀ Mt. Dulit.

Hitherto known from New Guinea only, the type (♀) being in the Oxford Museum. This species which is of a very pale testaceous colour, is readily recognized by two parallel bands across the head ("caput fuscente bifasciatum"), viz., a pale brown band between the upper margins of the eyes, and a more distinct black one between the lower margins. Shelford (Gen. Ins. fasc. 73, p. 14) regarded this species as synonymous with *P. propinqua* Walker, from Celebes. However, as the latter, the type (♀)* of which is also in Oxford, does not show the bands across the head, it will be safer to keep the two species separate.

*Not ♂, as stated by Walker (Cat. Blatt. B.M. p. 228).

PHYLLODROMIA GERMANICA L.

3 ♂ Mt. Dulit.

PHYLLODROMIA HAMIFERA Walker.

1 ♂ Mt. Murud, top.

PHYLLODROMIA HEWITTI Shelford.

2 ♂, 1 ♀ Mt. Murud.

1 ♀, Kalabit Country, 3000 feet.

The three specimens obtained show slight differences from the type (♂), from Kuching, Sarawak (7th February, 1899), in the Oxford Museum. In the type the head is of a uniform light mahogany colour, the tegmina have 21 costals, and in the wings there are 5 branches to the mediastinal vein, 12 costals, and a 3-ramose ulnar vein. In the specimens from Mt. Murud the head shows lighter and darker blotches, and in one of the ♂ specimens which was examined more in detail, the tegmina have 24 costals, the wings have the mediastinal vein 4-ramose, there are 15 costals, and the ulnar vein is bifurcate. However, these differences seem too slight to justify specific separation. The underside of the abdomen of the type, as well as of the present specimens, is testaceous, with a pair of large black blotches to each segment; the legs are also testaceous, with one or two black blotches on the coxae.

There is also in the Cambridge Museum a specimen (♀), presented by Shelford in 1903, with the locality "Borneo."

PHYLLODROMIA IRREGULARITER-VITTATA Brunner.

1 ♂, 1 ♀ Mt. Murud, 6500 feet.

Originally described from Borneo and Java. Represented in the Museums at Oxford and Cambridge by one specimen each from Borneo.

PHYLLODROMIA LONGE-ALATA Brunner.

1 ♂ Mt. Dulit.

There is in the Oxford Museum a series of 20 specimens of a Blattid from Kuching, Sarawak (March 1900), which Shelford identifies with this species. A single ♂ from Mt. Dulit fully agrees with that series though less satisfactorily with Brunner's description of his type (♀) also from Sarawak. The Mt. Dulit example may be described as follows:—

♂. Head not quite covered by the pronotum, shining chestnut to black; a narrow, deep orange band between the insertion of the antennae; antennae exceeding the tegmina, fuscous, setiform. Pronotum oval, posterior margin almost straight; disk shining black, with broad, white lateral margins. Tegmina much exceeding the body, pale chestnut, also with a white margin extending not quite to the apex; 13 costals, 5 discoidal sectors. Wings pale fuscous, anterior margin darker, 9 costals, median vein undivided, ulnar 3-ramose, triangular apical area distinct. Thorax and abdomen below shining black; cerci long, fuscous to black, 10 joints. Legs with the coxae shining black, femora chestnut, tibiae light brown, tarsi testaceous. Front femora sparsely spined, spines approximately all of the same size.

♂. Total length 13 mm.; body 9 mm.; pronotum 3 × 4 mm.; tegmina 10 mm.

This species has a superficial resemblance to *Pseudophyllo-dromia laticeps* Walker. The latter, however, may readily be distinguished by its broad, orange-coloured head.

PHYLLODROMIA OBTUSIFRONS Walker.

1 ♂ Mt. Murud.

The Oxford Museum contains, besides the type, from Sarawak, collected by Wallace, also three specimens from Kuching, presented by Shelford in 1900. Not known from outside Borneo.



Fig. 6. *Phyllodromia confluens* n. sp. × 4 ♀, Mt. Murud, 6000 feet.

PHYLLODROMIA CONFLUENS n. sp.

♀. Broad, short. Head almost covered by the pronotum; testaceous, vertex with 3 longitudinal broad brown lines, the median of which is continued down the frons to the base of the labrum; antennae (multilated) proximally testaceous, distally fuscous. Pronotum parabolic, posterior border rounded; testaceous, centrally with two large castaneous blotches, one on either side of the middle line, and a broad castaneous border along the posterior edge, this border being connected by a median, narrow, castaneous line with the blotches in front. Tegmina short, broad, barely exceeding the tip of the cerci; hyaline-testaceous, each with a large irregular castaneous blotch spreading over most of the posterior two-thirds of the wing, leaving free the mediastinal area and an irregular space in the ulnar area, opposite the middle of the dividing vein; an irregular fuscous blotch near the apex. Wings short and broad, infumated; 9 costals, their ends incrassated; median vein simple; apical triangle small, but distinct; ulnar vein 5-ramose; 1st axillary 4-ramose. Abdomen below testaceous, broadly and irregularly bordered with dark castaneous. Supra-anal lamina much broader than long, triangular, a median keel ending in the apical angle. Subgenital lamina broad, triangular, a similar keel ending in the apex. Cerci testaceous, with large castaneous blotches. Legs (first pair missing) testaceous, with dark blotches, viz., one on the distal end of the femora, and three along the anterior edge of the tibiae.

♀. Total length 11 mm.; body 9 mm.; pronotum 3×4 mm.; tegmina 8 mm.

Hab. 1 ♀ Mt. Murud, 6000 feet.

PHYLLODROMIA CRUCIFERA* n. sp.

♂. Vertex of head indistinctly mottled brown and testaceous; front testaceous; antennae fuscous, exceeding the tegmina. Pronotum elliptical, disk with brown and testaceous vermiculation, recalling *P. notulata* Stal., *P. polygrapha* Wlk., *P. obtusifrons* Wlk., *P. nimbata* Shelf., etc.; lateral margins hyaline. Tegmina broad, greatly exceeding the body, semi-hyaline testaceous, the transverse venules, especially towards the apex, strongly marked, cruciform or lozenge-shaped; mediastinal area broad, 11 costals, the 10th bifurcate, the

*From the cruciform venules of the tegmina.

11th multi-ramose; 5 discoidal sectors. Wings slightly infumated, mediastinal vein bifurcate; 9 costals, 1st to 5th simple, 6th bifurcate, 7th to 9th tri-ramose, all ends incrassated; ulnar vein 4-ramose; transverse venules strongly marked, but not thickened in the centre; apical area large, triangular. Front femora in their proximal $\frac{3}{4}$ th with numerous large spines, distal $\frac{1}{4}$ th with a series of closely set small spines. Legs testaceous, with black spots at the base of the tibial spines. Cerci long, unicolorous, testaceous, 10 joints. Styles symmetrical. Supra-anal lamina with a shallow, crescent-like indentation, black. Subgenital lamina testaceous, mottled with black; posterior border straight. Abdomen below testaceous, lateral margins black.

♂. Total length 20 mm.; body 12.5 mm.; pronotum 3.2×4.8 mm.; tegmina 17 mm.

The ♀ differs from the ♂ merely by the transverse venules of the tegmina and wings being less strongly marked.

Hab. 2 ♂ Mt. Murud, 6500 feet; 1 ♀ Mt. Dulit.

This species comes under *Chorisoblatta* Shelford; and is possibly allied to *Phyllodromia nodosa* Fritze which is described as "dimidia parte apicali in venis punctis nodosis fuscis, saltem in elytro sinistro conspersa."

PHYLLODROMIA CUNEI-VITTATA* n. sp.

♀. Head free, dark castaneous, shining, vertex slightly lighter; antennae at least as long as the body, black. Pronotum parabolic, posteriorly somewhat produced; disk black, with an ill-defined median longitudinal reddish-testaceous streak; lateral margins broad, testaceous. Tegmina exceeding the abdomen and reaching to the tip of the cerci, uniformly amber-coloured, semi-transparent; radial vein bifurcate, 15 costals; anterior ulnar 4-ramose, the branches running parallel and equidistant; 5 discoidal sectors. Wings slightly fuscous, radial vein bifurcate, 12 costals, their ends incrassated median vein bifurcate, ulnar simple; apical area small, but distinct. Abdomen below and cerci dark castaneous. Legs dark testaceous, with dark spots at the bases of the spines. Front femora proximally with 3 large spines, distally with a close series of small spines. Supra-anal lamina triangular; subgenital lamina ample, semi-globular.

*From the wedge-like black markings on the pronotum.

♀. Total length 13 mm.; body 10 mm.; pronotum 3×4 mm.; tegmina 10 mm.

Hab. 2 ♀ Mt. Dulit. One of the specimens with egg-case, with the suture carried to the left.

Allied to *P. irregulariter-vittata* Brunner.

The Oxford Museum contains an unnamed ♀ of the same species, from the Larut Hills, Perak, 4000--4500 feet, taken by R. Shelford, February, 1905. There is also a ♂ of the same date and locality, which Shelford apparently took to belong to the same species. It agrees with the ♀ in the markings of the pronotum and the venation of the tegmina, but differs by the colouring of the head which is orange-testaceous and bears a dark macula on the frons, by the abdomen being testaceous, and by the median vein of the wings being simple and the ulnar bifurcate.

PHYLLODROMIA INTERRUPTA n. sp.

♀. Short, broad. Head entirely covered by the pronotum; vertex testaceous; front testaceous, with a large horseshoe-shaped black blotch reaching from eye to eye; labrum testaceous; antennae at least as long as the body, fuscous. Pronotum parabolic, posterior border rounded, centre of disk testaceous, with a broad, shining black border which is continued along the hinder edge of the pronotum; sides hyaline. Testaceous. Tegmina reaching only to the apex of the cerci. Testaceous, with two large, shining black blotches, the nearer one occupying rather more than the distal half of the anal area and spreading through the radial area as far as the mediastinal vein; the further blotch occupying the distal two-fifths of the tegmina, leaving free the anterior margin which is light testaceous to hyaline; mediastinal area hyaline; 13 costals. Wings short and broad, almost colourless, 9 costals, median vein simple, ulnar 4-ramose, apical triangle distinct, 1st axillary 4-ramose. Abdomen below testaceous, the first 4 segments with the outer portion of the anterior margins black. Supra-anal lamina narrow, rounded. Subgenital lamina pentagonal much broader than long, median line raised into a ridge, distal angle sharp. Cerci dark testaceous below, lighter above. Legs uniformly testaceous; anterior femora with a few long spines, followed by a series of closely placed minute spines.

♀. Total length 12 mm.; body 9 mm.; pronotum 3×4 mm.; tegmina 9 mm.

Hab. 1 ♀ Kalabit country, 3000 feet.

Both this species and *P. confluens* n. sp. appear closely allied to *P. hamifera* Walker.

PHYLLODROMIA LUTEO-MACULATA* n. sp.

♂. Head testaceous, a dark band between the eyes; antennae black, reaching nearly to the tip of the tegmina. Pronotum oval, disk black, enclosing posteriorly an oblong testaceous macula, and anteriorly 3 or 4 small testaceous dots arranged on either side of a median narrow light line; lateral margins hyaline. Tegmina with their anterior third, or more hyaline; posterior two-thirds fusco-testaceous; two or three hyaline spaces in the basal third. Wings strongly infuscated, with a well-marked oval orange patch along the anterior margin; 10 costals; ulnar vein 4-ramose, the transverse venules strongly marked; apical triangle large, hyaline. Abdomen below, legs, cerci and styles testaceous. Front femora with large spines proximally a close-set series of small spines distally.

♂. Total length 14 mm.; body 10.5 mm.; pronotum 2.1 × 3 mm.; tegmina 12 mm.

Hab. 1 ♂ Mt. Murud, 6500 feet.

PHYLLODROMIA NIGRO-VITTATA n. sp.

♂ ♀. Head testaceous, with a black band between the eyes; antennae dark fuscous, reaching to the apex of the tegmina. Pronotum elliptical; disk testaceous, with black and brown vermiculations symmetrically arranged on either side of a central longitudinal light line; lateral margins hyaline. Tegmina much exceeding the abdomen, anterior half clear testaceous, posterior half with fuscous blotches, and a distinct black streak along the anal vein; 14 costals; and area with 5 longitudinal discoidal sectors; wings fuscous, mediastinal vein with 2 branches; 10 costals, the first 6 with their apices clavately incrassated; ulnar vein with 4 branches; apical triangle well developed. Abdomen below dark testaceous, with fuscous margins; cerci dark testaceous. Legs testaceous; front femora proximally with a few large spines, distally with a close-set row of minute spines (Shelford's type B.)†

*From the orange-yellow patch on the wings.

†Entom. Mo. Mag. (2), Vol. xxii, pp. 154-156 (1911).

♂ ♀. Total length 15.5 mm.; body 9.5 mm.; pronotum 2.8 × 3.2 mm.; tegmina 13.5 mm.

Hab. 2 ♂, 1 ♀ Mt. Murud, 6500 feet. Also occurs in Singapore (the Hon. C. J. Saunders, 1922), and on Bukit Kutu, Malay Peninsula, 3457 feet (myself, April 1915).

Closely allied to *P. nimbata* Shelford, from Kuching, Sarawak, the type of which is in the Oxford Museum, but differing from it by its larger size, the much longer tegmina, and the black streak along the anal vein of the tegmina which is very characteristic. Both *P. nigro-vittata* and *P. nimbata* come under *Chorisoblatta* Shelford, the type of which is *B. liturifera* Stal (characterized by the oblique discoidal sectors of the tegmina, the ramose ulnar vein of the wings, the large apical triangle, and the front femora being armed after type B.).

DURYODANA PALPALIS Walker.

1 ♂ Mt. Dulit.

The Oxford Museum has, besides the type, from Sarawak, collected by Wallace, a series of 16 specimens from Kuching, 1899 and 1900, presented by Shelford. Not known from outside Borneo.

PSEUDOPHYLLODROMIA PULCHERRIMA Shelford.

1 ♂ Tutau River; 1 ♂, 1 ♀ Mt. Dulit.

PSEUDOPHYLLODROMIA LATICEPS Walker.

1 ♀ Miri.

ALLACTA MICROPTERA n. sp.

♂. Head dark testaceous, shining; antennae testaceous. Pronotum large, parabolic, almost entirely covering the head, amber-coloured, shining. Tegmina short, lanceolate, covering the first four abdominal segments only; amber-coloured, anal area sub-fuscous; 8 costals, ulnar vein 3-ramose. Wings greatly reduced, much smaller than the tegmina, venation obliterated. Abdomen above castaneous, shining, end segment laterally with a white macula; below orange, with a broad sub-marginal fuscous border. Supra-anal lamina rounded. Cerci 8-jointed, white, except the 4th and 5th joints which are black. Styles minute. Legs testaceous, posterior femora moderately spined; arolia present.

♂. Total length 6 mm. ; tegmina 3 mm. ; wings 1.5 mm.

Hab. 1 ♂ Mt. Murud, top.

The other Malayan species of this genus are *A. parva* Shelford, from Kuching, Sarawak, the type of which is in the Oxford Museum, and *A. similis* Saussure (= *A. obtusata* Kirby), from the Cocos Keeling Islands. The two differ from the present species by the full development of their wings.

SUBFAM. 4. EPILAMPRINAE.

MORPHNA MÖBERGI n. sp.

♂. Head not quite covered by the pronotum, fusco-testaceous, with 3 longitudinal black lines on the vertex and a black blotch in front. Antennae as long as the body, proximally ferruginous, distally black. Pronotum large, oval posterior margin obtusely angled, deeply punctured, testaceous, with a large central black blotch, reaching to the anterior margin of the pronotum and occupying a fourth of it, posteriorly spreading out along the whole hinder margin of it; the two

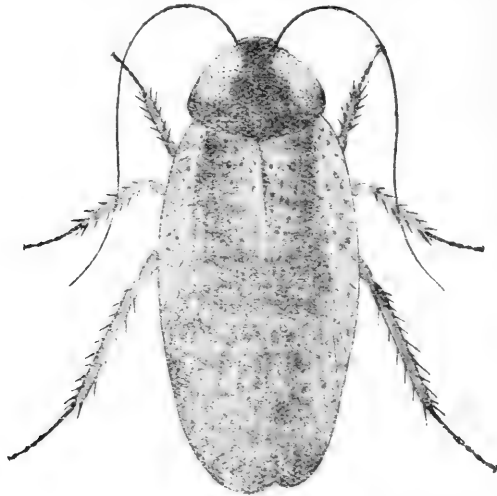


Fig. 7. *Morphna mjobergi* n. sp. $\times 1$, ♂, Mt. Dulit.

lateral testaceous areas with numerous large and deep black punctures and a few small brown dots. Tegmina much exceeding the body, deeply punctured, the mediastinal area light

testaceous with brown blotches; remainder of tegmina dark testaceous with numerous irregular black blotches and a black humeral stripe. Abdomen ventrally testaceous, on either side of each segment a large round black mark and scattered brown spots. Legs, cerci and styles testaceous, unicolorous.

♀. Slightly larger than the ♂, but of the same colouring and markings, only the abdomen ventrally darker.

Total length ♂ 51 mm., ♀ 53 mm.; body ♂ 37 mm., ♀ 40 mm.; pronotum ♂ 10×15 mm., ♀ 12×17 mm.; tegmina ♂ 42 mm., ♀ 43 mm.

Hab. 4 ♂, 9 ♀ Mt. Dulit.

This beautiful insect which I have much pleasure in naming after Dr. Mjöberg, is closely allied to *M. maculata* Brunner, but is readily distinguished by the markings of the pronotum. In *M. maculata* the central black blotch of the pronotum is much smaller, it is widely separated from the anterior margin, and reaches the posterior margin by only about six processes. The restricted occurrence of *M. mjobergi*, viz., so far known from Mt. Dulit only, is very remarkable, as compared with that of *M. maculata*, which has been taken at Singapore (by Wallace about 70 years ago, and by the Hon. C. J. Saunders at the Impounding Reservoir, Thomson Road, September, 1922), at Penang (H. N. Ridley, 1900), by myself at three places on the Malay Peninsula (Semangko Pass, Bukit Kutu and Gunong Kledang), and in Sarawak (Wallace and Shelford). Brunner gave the origin of his type as "Java"?

PSEUDOPHORASPIS TESTUDINARIA n. sp.

♀. Broad, convex. Head entirely covered by the pronotum, light testaceous, a large black blotch starting from between the eyes and continued downwards, giving off a branch on either side just below the insertion of the antennae and ending at the base of the labrum. Antennae (broken) nearly as long as the body. Pronotum parabolic, much broader than long, posteriorly only slightly produced, smooth, not impresso-impunctate; testaceous, heavily mottled with dark brown and black, with two large black maculae, one on either side of the middle line, nearer to the anterior margin; along the posterior margin a number of testaceous lacrymiform maculae, broadly bordered with black. Tegmina only slightly exceeding the abdomen, broad, rounded at the apex, testaceous,

heavily mottled with brown, with a series of large black blotches along the proximal third of the radial vein; anal area impresso-punctate, remainder of tegmina only slightly so. Abdominal sternites very dark, the testaceous ground colour almost entirely obliterated by brown and black. Posterior femora sparsely spined, posterior metatarsus biserially spined, its pulvillus small; remaining joints unarmed. Arolium large. Cerci 12-jointed.

♀. Total length 39 mm.; body 36 mm.; pronotum 10×15 mm.; tegmina 31 mm.

Hab. 1 ♀. Sarawak (no detailed locality).

This species has quite the appearance of an *Epilampra* and differs from that genus merely by its head being covered by the pronotum, and by the sparse spination of its posterior femora, two characters which would not seem of great importance.

RHABDOBLATTA PROCERA Burmeister.

1 ♀ Mt. Murud, 6500 feet; 1 ♂, 1 ♀ Lio Matu.
2 ♂, 2 ♀ Kalabit country, 3000 feet.

EPILAMPRA CIRCUMDATA Hanitsch.

1 ♀ Sarawak (no detailed locality).

I first described this species from Singapore and several places on the Malay Peninsula. This is now the first record from Borneo.

EPILAMPRA LURIDA Burmeister.

1 ♀ Tutau River.
1 ♀ Kalabit country, 3000 feet.

EPILAMPRA PLENA Walker.

3 ♂, 2 ♀ Mt. Murud, 6500 feet.

The three male specimens vary from 21 to 25 mm. in total length, the two females measure 22 mm. and are darker in colour than the males.

EPILAMPRA INTERMEDIA n. sp.

♀. Head slightly exposed, dark testaceous, with 3 longitudinal black lines on the vertex, a large castaneous blotch between the lower part of the eyes, and a second one between it and the labrum. Antennae as long as the body, light castaneous, unicolorous. Pronotum parabolic, posterior margin angled; smooth, not impresso-punctate, testaceous, with a dense mass of large and small black dots and a series of about 12 large spots along the posterior margin. Tegmina much exceeding the abdomen, minutely impresso-punctate, testaceous to light castaneous, with numerous round light spots against the proximal border of which slightly smaller brown spots are placed which are darkest in the basal portion of the tegmina and fade away apically. Both the light and the brown spots are specially large along the radial vein. Wings amber coloured, darkest along the anterior border. Abdomen testaceous to orange, with dark spots, darkest posteriorly, the sub-genital (♀) lamina almost entirely black. Legs dark testaceous, outer edge of tibiae black, tibial spines dark testaceous, metatarsus and tarsus of the same colour, but each joint black terminally.

♀. Total length 30 mm.; body 23 mm.; pronotum 6.5 × 8 mm.; tegmina 25 mm.

Hab. 1 ♀ Mt. Dulit. There is in the Oxford Museum an unnamed ♀ specimen from Kuching, Sarawak (R. Shelford, July, 1900), which agrees with the one from Mt. Dulit in all particulars, and another ♀, from Mt. Matang, Sarawak (January, 1897), which differs only by the brown blotches on the face being less distinct.

This species is of the typical habitus of an *Epilampra* and offers the usual difficulty of describing its colour and markings satisfactorily. It seems nearest allied to my *E. circumdata*, in which, however, the disk of the pronotum is of a uniform chestnut, with testaceous border.

EPILAMPRA UNICOLOR n. sp.

♀. Head almost covered by the pronotum, black shining; labrum testaceous; antennae (mutilated) brown. Pronotum parabolic, posteriorly angled, smooth, shining, castaneous. Tegmina just exceeding the body, their apex rounded, shining, uniform castaneous, anal area faintly impresso-punctate.

Wings amber-coloured. Abdomen below castaneous, legs castaneous (right hind leg entirely missing, the left mutilated). Metatarsus of the middle leg longer than the remaining joints, spined throughout the greater part of its length, pulvillus apical, first tarsal joint with few spines, arolia present.

♀. Total length 25 mm.; body 24 mm.; pronotum 7 × 8 mm.; tegmina 18 mm.

Hab. 1 ♀ Mt. Dulit.

The systematic position of this species is somewhat doubtful, as the hind legs of the single specimen obtained are mutilated. Its uniform colouring is quite unlike a typical *Epilampra*. At the first glance it might be taken for a small species of *Morphna*, yet the spined character of the metatarsus of its mid legs shows that it cannot belong to that genus.

RHICNODA RUGOSA Brunner.

1 ♂, 2 ♀ Mt. Dulit.

SUBFAM. 5. BLATTINAE.

METHANA PALLIPALPIS Serville.

1 ♂ Mt. Dulit; 2 ♀ Mt. Murud, 6500 feet.

One of the ♀ specimens from Mt. Murud is very much darker than the others. However, this would hardly justify specific separation.

As I have pointed out in a former paper (J., Malayan Branch, R. As. Soc., Vol. I, p. 435 (1923)) the proper place of this species should be under *Dorylaea*.

DORYLAEA ATRO-CAPUT n. sp.

♀. Head free, shining black; mouth parts black; antennae at least as long as the body, black. Pronotum parabolic, posterior border rounded, dark castaneous to black, shining. Tegmina only barely exceeding the body, broad, dark castaneous to black, shining. Wings light castaneous. Abdomen below dark castaneous, shining. Supra-anal lamina sub-quadrate,

its sides bulging out, its apex with a triangular cleft cerci twice as long as the supra-anal lamina, black, with 14 joints, hirsute. Femora castaneous, remaining joints of legs almost

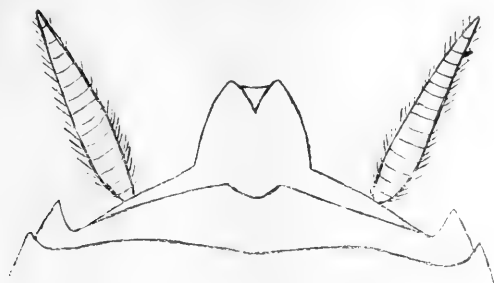


Fig. 8. *Dorylaea atro-caput* n. sp. ♀, Mt. Murud. Supra-anal lamina $\times 6\frac{2}{3}$.

black; posterior metatarsus as long as the remaining joints biseriately spined; second and third tarsal joints moderately long, spined; fourth joint unarmed; pulvilli moderately large; arolia present.

♀. Total length 24 mm.; body 23 mm.; pronotum 7×9 mm.; tegmina 16 mm.

Hab. 1 ♀ Mt. Murud.

Allied to *D. unicolor* Shelford, from Talaut I. (Gen. Ins. fas. 109, p. 14 (1910)). But whilst in this latter species clypeus and labrum are rufous, and the maxillary palps

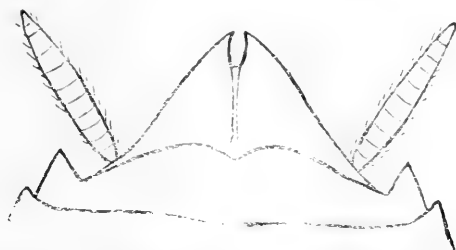


Fig. 9. *Dorylaea unicolor*, Shelf., ♀ Talaut Islands. Supra-anal lamina $\times 6\frac{2}{3}$.

fuscous, all the mouth parts of *D. atro-caput* are intensely black. Further, the supra-anal lamina of *D. unicolor* is triangular, that of *D. atro-caput* sub-quadrate.

BLATTA CONCINNA De Haan.

2 ♂, 2 ♀ Kalabit country, 3000 feet.

PERIPLANETA LATA Herbst.

1 ♀ Mt. Murud, 6500 feet; 1 ♀ Mt. Dulit.

PERIPLANETA NIVEI-PALPIS n. sp.

♀. Head free, shining black; maxillary palps with the 3 basal joints snow-white, terminal joint whitish testaceous; antennae as long as the body, fuscous. Pronotum parabolic, shining black. Tegmina much exceeding the abdomen, dark castaneous, lighter towards the tips. Wings testaceous. Abdomen below intense black, shining. Cerci stout, black, 6 joints. Legs long, slender, reddish testaceous, coxae castaneous; posterior metatarsus longer than the remaining joints, strongly spined; 2nd and 3rd joints also spined; arolia present.

♀. Total length 20 mm.; body 15 mm.; pronotum 5.2 × 6 mm.; tegmina 16 mm.

Hab. 1 ♀ Lio Matu.

Readily distinguished by its white palpi from all other Malayan species of *Periplaneta*.

PERIPLANETA SUCCINEA n. sp.

♂. Small, slender, elongate. Head piceous shining; mouth parts castaneous; antennae dull brown, reaching at least to the apex of the tegmina. Pronotum parabolic, posterior margin rounded; dark castaneous, shining. Tegmina much exceeding the abdomen, light castaneous to amber. Wings amber. Abdomen below castaneous, at the sides and towards

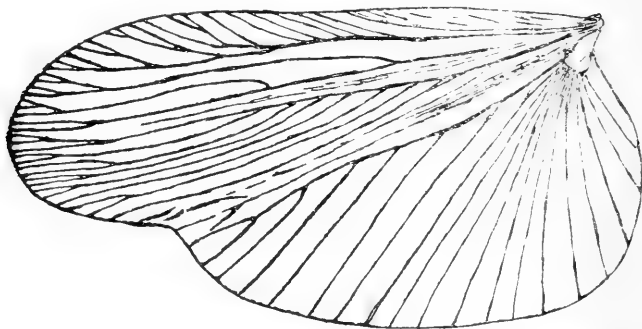


Fig. 10. *Periplaneta succinea* n. sp. ♂, Mt. Dulit. Left wing × 4.

the apex almost piceous. Supra-anal lamina semi-circular, entire; subgenital lamina transverse, posterior margin straight, or only with a faint indentation. Cerci black, styles castaneous. Legs light castaneous.

♂. Total length 27 mm.; body 18 mm.; pronotum 5.5×6.5 mm.; tegmina 22 mm.

Hab. 5 ♂ Mt. Dulit; 1 ♂ Mt. Murud; 1 ♂ without locality.

Closely allied to my *P. montana*, from the Malay Peninsula. Differing from it by its somewhat larger size, its lighter colour, and by the posterior margin of the subgenital lamina showing no semi-lunar indentation, but being practically straight. The single ♂ obtained on Mt. Murud is slightly larger than those from Mt. Dulit, viz., 29 mm. in total length, and lighter in colour, especially its pronotum being more of an amber tint. It is curious that all the seven specimens obtained were male.

CATARA RUGOSICOLLIS Brunner.

3 ♂ Mt. Murud, 6500 feet; 3 ♂ Mt. Dulit; 1 ♂ Tutau River.

5 ♀ Mt. Murud, 6500 feet; 1 ♀ Tutau River.

1 ♂ Kalabit country, 3000 feet.

CATARA MINOR Krauss.

1 ♂ Mt. Murud, 6500 feet.

PROTAGONISTA FUSCA n. sp.

♂. Head not covered by the pronotum, piceous, very minutely punctured; eyes closer together than antennal sockets; antennae at least as long as the body, black, tips testaceous. Pronotum, rectangular, as long as broad, opaque, piceous, very minutely punctured, with scattered erect pubescence, a slight longitudinal ridge running along its middle, and a transverse

ridge at $\frac{1}{4}$ from the front. Tegmina narrow, somewhat exceeding the body and reaching to about the end of the long cerci;

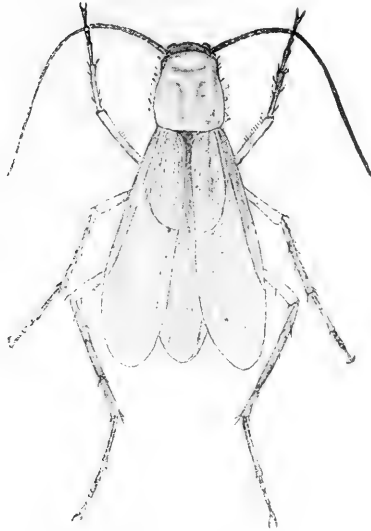


Fig. 11. *Protagonista fusca* n. sp.
× 2 ♂, Mt. Dulit.

dark fuscous proximally, lighter distally; mediastinal area narrow, deflexed, black; anal vein distinct, reaching nearly half-way down the sutural margin; anal area almost black, finely punctured, remainder of tegmina very sparsely so. Wings fuscous. Abdomen and styles piceous; cerci long, with only about 10 joints testaceous, terminal joint black. Subgenital lamina transverse, twice as broad as long, the posterolateral angles rounded. Coxae of all the legs with the proximal half black, the distal half very light testaceous; femora black, with the distal $\frac{1}{4}$ light testaceous; tibiae black, their proximal end testaceous; tarsi light testaceous only at the proximal end, remainder entirely black; metatarsi and tarsal joints also black. Legs, especially the hind ones, long and slender, somewhat exceeding in the length the following joints; front femora with a comb-like series of about 11 small spines; mid femora with two spines on the anterior, and one spine on the posterior margin; hind femora with 3 spines on the anterior, and 2 spines on the posterior margin; spines of the hind tibiae biserially arranged, few in number; hind metatarsus entirely spined, first tarsal joint with about 6 spines. Arolia present, moderate.

♂. Total length 20 mm.; body 16 mm.; pronotum 5 × 5 mm.; tegmina 16 mm.

Hab. 3 ♂ Mt. Dulit.

Closely allied to *P. pertristis* mihi, from the Malay Peninsula, of which only 1 ♀ is known. (See Journal, Malay Branch, R. As. Soc., Vol. I, p. 444, fig. 28 (1923)). Indeed, additional material may show that the two species are iden-

tical. Both of them come near *Eroblatta borneensis* Shelford, the differences between *Eroblatta* Shelf. and *Protagonista* Shelf. being only slight. *P. fusca* ♂ and *P. pertristis* ♀ agree in having the abdomen below entirely black, and the proximal three-fourths of the hind femora black, the distal one-fourth testaceous. In *Eroblatta borneensis* ♂ the basal segments of the abdomen are testaceous, the terminal ones black; and the greater part of the hind femora is testaceous, and only the distal one-fourth black.

The figure is drawn in the Hymenopteron-like attitude, with tegmina and wings slightly opened, which the insect generally seems to adopt.

SUBFAM. 8. CORYDINAE.

HOMOPTEROIDEA SHELFORDI n. sp.

♂ ♀. Head covered by the pronotum, globose; vertex shining black; front less intense black, shining; clypeus brown; eyes small, far apart; antennae dark fuscous, reaching to the apex of the tegmina. Pronotum sub-circular, posterior margin almost straight; corrugated; disk shining black, lateral margins hyaline. Tegmina much exceeding the body, dark fuscous, posterior portion, comprising the area between the ulnar vein and the suture, hyaline; all veins strongly marked, raised; mediastinal area very narrow; radial vein arising by 3 roots; ulnar vein giving off 7 branches towards the suture; anal area small, with 3 veins only. Wings fuscous, anterior border very dark; radial vein with 7 costals; median vein bifurcate; ulnar vein with 3 branches which at half their length are connected by transverse anastomoses and are then replaced by 5 veins which, together with the 6 costals and the 2 branches of the median vein, form a fan-like system of veins radiating towards the periphery of the wing. Anal area small, not fan-like folded, in repose placed over the fore part of the wing. Abdomen beneath fuscous, cerci very long, brown to black. Legs fuscous.

♂ ♀. Total length 9 mm.

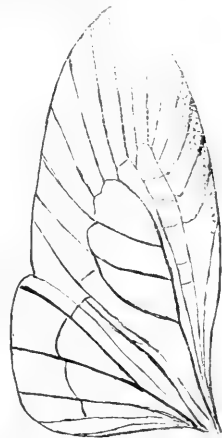


Fig. 12. *Homopteroidea shelfordi* n. sp. Mt. Murud, 6500 feet. Left wing $\times 8$.

Hab. Numerous ♂ and ♀ specimens, Mt. Murud, 6500 feet, Mt. Dulit and Tutau River. As the Oxford Museum contains an example, not named, taken by R. Shelford on the Larut Hills, Perak, 4000--4500 feet, February--March, 1905, I dedicate this species to his memory.

Closely allied to *H. nigra* Shelford, from Kuching, Sarawak, the type of which, though much mutilated, is in the Oxford Museum. But though the two species agree in the structure of their wings, *H. nigra* is readily distinguished by the apex of its tegmina being reticulate. Both tegmina and wings of *H. shelfordi* show a remarkable resemblance to those of *Latindia signata* Brunner (coll. Fieber). See his Nouveau Systeme des Blattaires, pl. x. fig. 49. Curiously enough, Brunner, in his remarks on *Latindia* Stal (op. cit. p. 344), says:—"Les ailes me sont inconnues," a statement difficult to reconcile with his careful illustration.

CTENONEURA* n.g.

Pronotum sub-circular, with no pubescence. Tegmina much exceeding the abdomen, overlapping each other, horny, not pubescent, venation clearly defined. Wings as long as the tegmina in both sexes, ulnar vein with parallel, curving, comb-like arranged branches, anal area not fan-like folded. Supra-anal lamina (♂ and ♀) short, transverse. Subgenital lamina in the ♂ narrow, crescent-like, with 2 styles; in the ♀ ample, globose, with shallow cleft. Cerci long. Arolia minute or absent.

This is a somewhat aberrant genus. It differs from the typical Corydinae by having the supra-anal lamina of both sexes not produced, but narrow, and through both pronotum and tegmina being smooth, not pilose. However, its unarmed posterior femora, the minute or absent arolia, and especially the venation of the wings show that its proper place is in this sub-family. The entire agreement of the venation of its wings with that of *Euthyrrhapha* Burmeister, is very striking, though its tegmina show neither the straight suture nor the pilosity of that genus.

*From the comb-like arrangement of the branches of the ulnar vein in the wings.

CTENONEURA FULVA n. sp.

♂ and ♀. Head covered by the pronotum, black, shining; antennae black, moniliform reaching nearly to the apex of the tegmina. Pronotum elliptical, disk dark testaceous to castaneous; lateral margins broad, hyaline, yellowish. Tegmina much exceeding the body, fulvo-testaceous, shining; mediastinal area yellowish, hyaline; radial vein with 12 costals, of which the first 6 arise by a common trunk, the distal 6 singly;

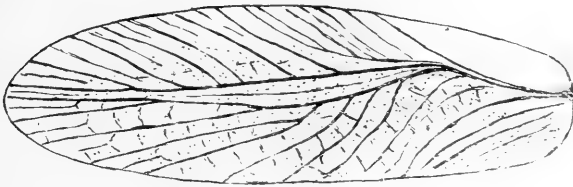


Fig. 13. *Ctenoneura fulva* n.g. & n.sp. ♀, Mt. Dulit. Left tegmen $\times 8$.

median vein undivided; ulnar vein with 9 branches; 4 discoidal sectors. Wings hyaline, central portion colourless, margins yellowish, a dark patch along the anterior margin, near the ends of the first costals; mediastinal vein bifurcate; 8 costals; median vein multi-ramose; ulnar vein with 7 curving, branches.

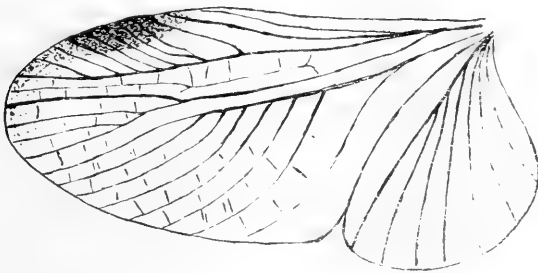


Fig. 14. *Ctenoneura fulva* n.g. & n.sp. ♀, Mt. Dulit. Left wing $\times 8$.

Abdomen below testaceous, with darker margins. Supra-anal lamina (♂ and ♀) short, transverse, with a slight longitudinal keel; sub-genital lamina (♂) narrow, crescent-like, in the ♀ globose, ample, with a shallow median incision. Cerci very long, 7 joints. Legs testaceous, arolia minute.

♂ and ♀. Total length 10.8 mm.; body 7 mm.; pronotum 2 × 3 mm.; tegmina 9.2 mm.

Hab. 3 ♂ Mt. Murud, 6500 feet; 1 ♂, 2 ♀ Mt. Dulit.

CTENONEURA MAJOR n. sp.

♂ and ♀. Head almost covered by the pronotum; vertex shining black, frons fuscous, shining; ocelli orange; antennae as long as the body, dark fuscous. Pronotum suborbicular, disk dark brown to black, margins dark hyaline. Tegmina much exceeding the abdomen, yellowish fuscous, radial vein with 12 costals, median vein single, broken up and discontinuous; ulnar vein with 8 branches, some of which are subdivided and anastomosing; 4 discoidal sectors. Wings fuscous, anterior portion dark; radial with 8 costals; median vein 3-ramose; ulnar with 8 branches; anal area small, only about one-fourth of the total area of the wing; first axillary with 3 branches. Abdomen below dull testaceous. Cerci fuscous, with 8 joints, sub-moniliform. Legs long, slender, dull testaceous; no arolia.

♂ and ♀. Total length 12.5 mm.; body 8.3 mm.; pronotum 2 × 3 mm.; tegmina 11 mm.

Hab. 1 ♂, 1 ♀, Mt. Murud 6500 feet.

Differs from *H. fulva* chiefly by its larger size and darker colour.

DYSCOLOGAMIA CESTICULATA Saussure.

1 ♂, Tutau River.

SUBFAM. 9. OXYHALOINAE.

DIPLOPTERA BICOLOR n. sp.

♂. Head free: vertex cinnamon brown, with 3 faint black



Fig. 15. *Diploptera bicolor* n. sp. $\times 4$;
♀, Pah Trap Kalabit country.

body, light cinnamon brown, minutely pitted with black. Wings with the mediastinal area opaque and coriaceous, remainder hyaline, venation as in *D. dytiscoides* Serville. Abdominal tergites and sternites black, both with narrow lateral reddish-brown borders. Supra-anal lamina narrow, transverse black, with brownish border. Subgenital lamina black asymmetrical, its right half receding; only the right style present. Cerci testaceous. Legs black, posterior metatarsus cinnamon; spines cinnamon.

longitudinal lines; face black; antennae body, their basal one twice as long as the third black, remainder fuscous. Pronotum oval, hinder margin nearly straight; black with a reddish testaceous border all round, widest at the sides, narrowest in front; very finely pitted. Tegmina slightly exceeding the

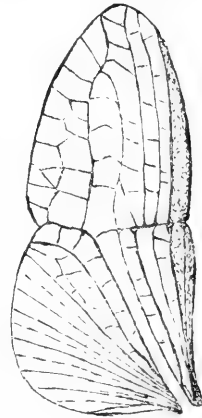


Fig. 16. *Diploptera bicolor* n. sp. ♂, Pah Trap Kalabit country. Left wing $\times 4$.

♂. Total length 11 mm.; tegmina 7.5 mm.; wings 13.2 mm.

Hab. 1 ♂ Pah Trap, Kalabit country.

The discovery of a new species of *Diploptera* is very interesting as so far only two species of this genus had been known, viz., *D. dytiscoides* Serville, first described from Australia as long ago as 1839, and since recorded also from Ceylon, Burma, the Malay Peninsula, Singapore, Sarawak, the Philippines, Buru, Honolulu and Tahiti, and *D. minor* Brunner, which seems peculiar to the Philippines.

DIPLOPTERA MACULATA n. sp.

♀. Head free, black, vertex and mouth parts dull orange; antennae (mutilated) with their first 15 joints black, remainder brown. Pronotum roughly oval, hinder border nearly straight, orange-testaceous; a triangular black macula behind the centre, a slanting black vitta on either side of it, the two vittae converging forwards, but not meeting; very finely punctured. Tegmina just exceeding the abdomen, uniform dull orange-testaceous, closely and deeply punctured. Wings clear hyaline, mediastinal area opaque, venation similar to that of *D. dytiscoides* Serv. 1st abdominal tergite black; 2nd laterally with narrow orange margins; 3rd to 7th with broad orange margins, each containing a round black spot; 8th tergite and supra-anal lamina entirely orange;

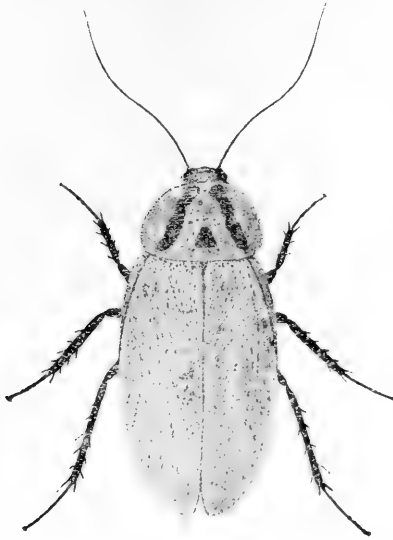


Fig. 17. *Diploptera maculata* n. sp. ×3; ♀, Pah Trap Kalabit country.

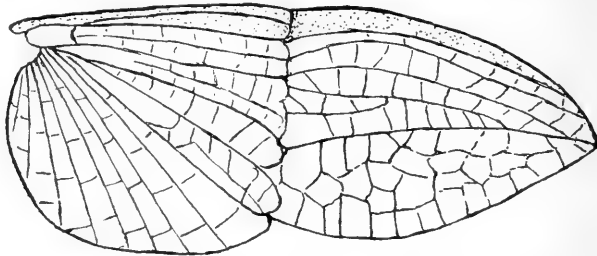


Fig. 18. *Diploptera maculata* n. sp. ♀, Pah Trap Kalabit country. Right wing ×4.

abdominal sternites black with very narrow lateral orange borders. Cerci orange. Legs black.

♀. Total length 15 mm.; body 14 mm.; pronotum 3×4 mm.; tegmina 12 mm.; wings 20 mm.

Hab. 1 ♀ Pah Trap, Kalabit country.

It is very likely that the discovery of additional material will prove *D. maculata* merely to be the ♀ of *D. bicolor*. The collection unfortunately contained only one specimen of each.

SUBFAM. 10. PERISPHAERINAE.

PARANAUPHOETA LYRATA Burmeister.

1 ♀ Mt. Murud, 6500 feet.

PSEUDOGLOMERIS FLAVICORNIS Burmeister.

2 ♂ Mt. Murud, 6500 feet.

SUBFAM. 11. PANESTHINAE.

SALGANEA MORIO Burmeister.

1 ♀ (adult, fully winged) Mt. Dulit; 1 ♀ (larva, tegmina squamiform) Mt. Dulit.

The two specimens obtained show the extraordinary variation in size to which this species is subject, the larva being considerably larger than the adult. The latter measures :—

Total length 42 mm.; body 32 mm.; pronotum 7.5×11 mm.; tegmina (much exceeding the abdomen) 34 mm.

The corresponding measurements for the larva are :—

Total length (=body) 49 mm.; pronotum 12×18 mm.; tegmina (squamiform, reaching only to the posterior margin of the metanotum) 8.5 mm.

PANESTHIA JAVANICA Serville.

There are 35 specimens, differing greatly in size in the development of tegmina and wings, and in colouring, which I am obliged to refer for the present all to this species. They are :—

6 ♂ Mt. Dulit, 2 ♂ Tutau River, all of normal size and habitus, and fully winged (i.e., both tegmina and wings fully developed), the largest specimen, from Mt. Dulit, measuring 55 mm. in total length.

1 ♂ Mt. Dulit, fully winged, but exceptionally small and dark, total length 36 mm.

2 ♂ Mt. Murud, 6500 feet, short winged, the tegmina reaching to the end of the 5th abdominal segment only; total length 51 mm.

1 ♂ (label not decipherable) small and dark.

1 ♂ larva, normal, apterous, Kalabit country, 3000 feet.

1 ♂ larva, apterous, with faint orange spots on the metanotum only, Mt. Dulit.

3 ♂ larvae, apterous, with two orange spots on the metanotum only, which are practically confluent in the middle, Mt. Murud 6500 feet.

10 ♀ Mt. Dulit; 4 ♀ Lio Matu; 1 ♀ Mt. Murud 6500 feet, and adult, fully winged and of typical appearance.

2 ♀ Mt. Dulit, adult and fully winged, but small and dark.

1 ♀ larva, Mt. Murud 6500 feet, apterous, with orange maculae on the metanotum only.

PANESTHIA SINUATA Saussure.

6 ♂ Mt. Murud, 6500 feet; 1 ♀ Pah Trap.

Of the male specimens two have the tegmina fully developed, though not quite reaching to the apex of the abdomen; in two others the tegmina cover the first three abdominal segments only, and two specimens (larvae?) are apterous. In the female specimen the tegmina are somewhat mutilated, but probably reached to about the 5th abdominal segment. A typical ♂ measures:—

♂. Total 27 mm.; pronotum 5.5×8.5 mm.; tegmina (slightly worn at the apex) 18 mm.

This would appear to be the first record from Borneo. The type (♂) of this species came from Singapore, but to my knowledge no other example has been taken there or elsewhere.

IX.—Collembola from Mt. Murud and Mt. Dulit, in Northern Sarawak. By Dr. H. SCHÖTT.

(With two Plates.)

Some time ago the late Curator of the Sarawak Museum, Dr. E. Mjöberg, requested me to work up a collection of Collembola, made during his expedition in the regions of the upper sources of the Baram river in North Sarawak.

The work is herewith finished and has resulted in the creation of three new genera. Out of twelve species eleven have proved to be new only, one being known before. I have also been able to shed new light on some critical genera.

While working up the collections (106 specimens) the specialist, Dr. E. Handschin from Switzerland, has been contemporaneously working up certain material from Java and Sumatra. His work has already gone in print, but to prevent our work overlapping and describing the same species under two separate names, Dr. Handschin has been polite enough to send me a typewritten copy of his manuscript and also photographs of the new species. For this proof of good sense and extraordinary kindness I beg to express my deeply felt gratitude.

ARTHROPLEONA.

FAMILY PODURIDAE Lbk.

ACHORUTES Templ.

1. ACHORUTES SEMILUNARIS n. sp.

Tuberculi distinct only on the head and the posterior segments of the body; symmetrically arranged longer setae on the intermediate tergites possibly point to the existence of dorsal protuberances, but their contours are so vague that it seems impossible to trace them with certainty on preserved material. *Granula* of medium size, not showing any pronounced difference in size on the head or other parts of the body. *Mouthparts*

strongly reduced, mandibles hook-shaped, with a lamellous tooth; maxillae needle-shaped.

Eyes 2+2, unpigmented, on the outer margin of a tubercle; cornea divided into two halfmoon-shaped parts by an extremely fine line—hence the species name.

Postantennal organ absent, *antennal organ* III as usual consisting of two-staffs. In one specimen they seem to be directed straight upwards, but in another one they are distinctly depressed, as generally seems to be the case among most species. Protective setae of common type I have failed to observe but there is always the usual longer setae on the outside of the organ.

IV has at the top a retractile tripartite organ, surrounded by several protective setae, which are inserted in special impressions on the skin. Sensitive setae of antennae number 7, all placed on the last joint. To describe their position in detail offers great difficulties as the different preparations give a different picture depending upon the position of the antennae under the covering glass. On one I find 2 external, 1 anterior and 4 superior. Hairs scattered, simple; claws unarmed.

Coloration. Specimens in alcohol pure white with a slight shade of yellowish, but according to Dr. Mjöberg fresh pink when alive.

Locality. Ten specimens collected at Brooketon, Brunei Territory. Lives under rotten logs on damp ground. (Mjöberg).

Remarks. This form comes close to Imms' *Neanura intermedia*, but the latter has only four sensitive setae on Ant. IV. A couple of these are easy to overlook but the fact that the author especially points out this character in a comparison with another species and that he had a large material at his disposal, makes it probable that the observation is correct. The structure of the eye-lobes forms possibly also a good distinctive character.

From other species with 2+2 pigmentless eyes the present form is easily distinguished. *Neanura corallina* Imms has characteristic lateral protuberances and, to judge from the text as well as the illustration, the sensitive setae are absent on Ant. IV. *Achorutes roseus* Schött from Australia has distinct protuberances arranged as in *A. muscorum*, large granula and six sensitive setae on Ant. IV. and Börner's Japanese species, *A. lipaspis* and *A. hirtellus* have apart from other separating characters a distinct ventral tooth on the claw-bearing joint.

2. *ACHORUTES BORNENSIS* n. sp.

Tuberculi very large, in number and position recalling *A. muscorum*. They are, however, not ray-like in structure, but more uniformly granulated. *Granular* large, cone-shaped, with exception on the antennae, where they are strikingly small, especially on the two interior joints.

I have not been able to examine the mouthparts, but believe myself able to see hoop-shaped mandibles shining through, when the preparation is viewed from below.

Eyes 3+3; pigmented and placed on a tubercle in such a way that two are sitting at the lower margin somewhat obliquely near each other at a distance not quite equal to the diameter of the cornea, and a third one higher up in the vicinity of the base of the antennae.

Postantennal organ absent. Ant. organ III consisting of two depressed staffs within a chitinous fold. Ant. IV with a tripartite, retractile terminal organ surrounded by protective setae in hollow shaped papillae.

The bent sensitive setae number 7, the superior one smaller than the other ones and visible only from the ventral side. It seems also to be fixed on Ant. III. The setae are of three different kinds: robust and comparatively short ones, very thinly serrated ones with lancet-shaped, sharp points, long ones with thread points and very fine feeble, simple ones (setae sensuales). In the first two kinds the chitin is yellow, in the other ones white, vitreous. On Ant. I and II all the different kinds of setae are represented, on Ant. III and IV only the last kind. *Tuberculi* richly beset with setae to such an extent that the body under the microscope appears entirely spinous. A seta sensualis is always to be found on each tubercle. *Claw* with a strong internal tooth near the base of the joint.

Coloration. Of this species there are two specimens, both slightly damaged; one has been treated by potash solution, the other kept in a glycerine-separate. The colour of the body is dirty white, but according to a note by Dr. Mjöberg the living animal is pinkish and very sluggish in its movements. Length 3 mm.

Locality. Mt. Murud, 6000 feet.

Remarks. The present species is easily distinguished from other species with pigmented eyes, 3+3.

A. muscorum for instance differs among other things by the sculpture of the tuberculi, the distance between the eyes and the hairs. It differs from *Neanura pudibunda* Imms by the

number of tuberculi and the presence of a postantennal organ, etc., and finally from the recently described *A. zehutnezi* Handsch. from Java and Sumatra by the sculpture of the tuberculi, the position of the eyes and the number of the antennal sensitive setae.

LEPIDOCYRTUS Bourl.

That my proposal of dividing the genus *Lepidocyrtus* was bound to be criticised I was fully aware. The new material that now has been procured from Borneo and Sumatra gives me good reasons to take up my revision of the difficult genus again and, as I hope, this time with better results.

I would like to point out that what Tullberg calls puncture on the *Lepidocyrtus* scales and also taken as such by me, by closer examination turns out to consist of a sculpture of an exceedingly small comb-like, densely arranged striation. On account of the transparent and extremely thin scales, however, the real nature of this sculpture can be revealed only at very favourable circumstances, as for instance when one scale lies immediately on the top of another one and even then only at the highest magnification possible.

The scales are always rounded in the free end. This type of scales is to be found in the genera *Lepidocyrtus* and *Acanthurella*. As a type of an exotic species of the former genus *L. maximus* may be chosen. Other characters are that Ant. IV is without a retractile terminal organ and that the tibiae are unjointed. It is also worthy of mention that the eye lobes are so squeezed together that the spots are nearly rounded.

Undoubtedly also the arrangement of hairs in the living animal offers good characters, but unfortunately hairs and setae drop off only too easily at capture or in preservation. I believe, however, that generally speaking the body can be said to be only relatively thinly covered with hairs or setae in the forms here in view.

Parallel to the large *Lepidocyrtus* species, a variety of other forms are also to be found in exotic material. They have as a rule pointed scales but also rounded ones and their sculpture consists of more or less elongate, distinct strips, in that respect reminding one of the *Sira*-scales. Ant. IV is provided with a distinct terminal organ and the fold (plica) mentioned by

Tullberg as occurring on the tibiae of the *Sira*-species is also plainly visible and sometimes becomes so deep that the joint here appears to be bent. The eyes are more widely separated from each other, with the result that the "spots" appear more elongate.

Often the head and abdomen of these forms are richly beset with serrated, club-shaped setae and not seldom the posterior abdominal segments possess extraordinarily long serrated setae, which however cannot be taken as botryothrichs.

From what has been mentioned above the genus *Lepidocyrtus* seems to be well defined. In order to classify properly also the other forms I am of the opinion that my collective genus *Lepidocyrtoides* must be divided up and it seems to me that the so often attacked character "mesonotum prominens" should not be entirely discarded.

As type of the genus *Lepidocyrtus* I propose to keep *L. cucullaris* and would like to add also *Lepidocyrtus striatus* which also is characterized by pointed scales. Unfortunately the latter form was never examined as regards the antennal sensitive organ for reasons given in my paper on Dr. Mjöberg's Australian Collembola.

For the *Sira*-like forms of the genus *Lepidocyrtoides* I suggested the expressive name *Lepidosira*. To this I refer without hesitation *L. australicus*, *L. sagmarius*, *L. coeruleus* and *L. cinctus*.

In this connection it deserves to be mentioned that Handschin already has extracted *L. spinosus* from the *Lepidocyrtoides*-group and placed it in a genus of its own, *Acanthocyrtus*. Later on he expresses in a letter to me his thought of possibly entering this form into the genus *Acanthurella*. Personally I feel inclined to let it form a separate genus. The dental spines are here arranged in several rows and are comparatively small, vitreous and simple, whereas the spines in the *Acanthurella*-species form one row and are serrated. Also the chaetotaxy of the furcula of both genera is entirely different.

Furthermore the genus *Acanthocyrtus* is characterized by pointed scales and retractile terminal organ of Ant. IV and 2-jointed tibiae which is not the case with *Acanthurella*.

About the systematic position of *Lepidocyrtoides longicornis*, *L. flavocinctus* and *L. angustatus* I cannot at the present moment express any definite opinion.

SUBGENUS ACANTHURELLA.

3. ACANTHURELLA ZONATA n. sp.

Diagnosis. Ant. I 1 : 0.39.

Ant. I : II : III : IV = 1 : 1.66 : 1.33 : 2.06.

Abd. III : IV = 1 : 5.43.

Manubr : Mucrodens = 1 : 0.88.

Mesonotum strongly protruding, slightly curved backwards. *Eyes* 8+8, the two proximal ones much smaller. "Maculae" nearly round. Antorg. II consisting of 3 or possibly 4 free staffs. Ant. III I have not been able to trace, but probably it consists of two staffs within a fold as usual. Internal margin of claws with a proximal double tooth and a distal, simple one. Pseudonychids indistinctly developed, but seem to have a lateral tooth at the base. The empodial appendix in all the three pairs of legs stilette-shaped. The difference in size of the different pairs of legs very little pronounced. They reach to the distal tooth or slightly over it. There is a tibio-tarsal and distinctly incrassate sensitive seta. The spines of the furcula appear already on the lower parts of manubrium: They are of different size and distinctly serrate. They alternate here with very robust serrated setae, which appear to be double contoured. The joint is also covered by long, slightly curved, feather-like setae on the ventral side. Of dental spines there are only some few ones left above. They seem to vary in size. Mucrones bidentate, with basal spine. Scales large, thin, rounded in the free end, with a sculpture of sometimes very small, indistinct striae. On the antennae they are noticeable to the second joint. Between the abdominal segments and on the upper side of mesonotum there are groups of extraordinarily long scales. Under mesonotum there is a group of protruding, robust, unsculptured sharply pointed setae.

Ant. I, II, densely covered by feather-shaped setae of normal size, among which also some longer ones seem to be directed outwards at the sides of both the internal joints. On Ant. III, IV, the feather-shaped setae become smaller and transparent and are placed more distant apart from each other.

Coloration. Head yellowish, Ant. I and II slight reddish, III and IV are whitish, the former with a distal blue spot. Mesonotum is blue pigmented with oblique stripes and scattered dots. A blue girdle is noticeable extending from mesonotum to Abd. III. There is also an obliquely placed

blue spot with irregular contours on the big abdominal segment which otherwise is yellowish. The scales probably give the living animal a rusty reddish tint. Tibiae whitish, sometimes partly bluish, manubrium slightly bluish, dentes uncoloured.

Locality. 2 specimens from Mt. Dulit, 3500 feet.

4. *ACANTHURELLA GLAUCA* n. sp.

Diagnosis. Ant. I=1 : 0.42.

Ant. II : III : IV=1 : 1.25 : 1.31 : 1.93.

Abd. III : IV=1 : 7.

Manubr : Mucrodens=1 : 1.02.

Antorg. II consisting of six free staves, Antorg. III of two obliquely placed, strong staffs in a plica. Dental spines of about the same size and arranged in a row on the interior side of the segment.

Agrees otherwise in all more important morphological characters completely with the last mentioned species.

Length of body 3 mm.

Coloration. With reference to the colour markings the following variations occur :—

(1) Main colour yellowish with longitudinal stripes on the sides of mesonotum, all joints of antennae dark, nearly black, genae thinly pigmented in a reticulated pattern, legs lightly blue-pigmented, fork light. 1 specimen from Mt. Murud, 6500 feet.

(2) Not quite so strongly pigmented, otherwise entirely agreeing with (1). 4 specimens from Mt. Murud, 6000 feet.

(3) Pigmentation very undecided. 4 specimens from Mt. Murud, 6500 feet. On a label attached Dr. Mjöberg calls them "ground podurids." Two of those are nearly greyish whitish with mesonotum straight upstanding or even slightly bent forwards. I do not dare, however to classify them as a separate species.

PSEUDOSIRA Schött.

Pseudosira has always occupied a very debated position in the system and some authors have even doubted its "raison d'être." When creating the genus on a single specimen in 1893 I was guided only by the following facts :—

(1) the animal had a *Sira*-like shape of the body.

(2) it had falciform mucrones.

(3) it was covered with scales.

Pseudosira was to be compared with *Sira* as my previously classified Californian genus *Drepanura* with *Entomobrya*. Later on I got a bit doubtful and thought that I possibly had overrated the importance of the shape of the mucronal segment and suggested sinking *Drepanura* as synonymous with *Entomobrya* and *Pseudosira* as synonymous with *Sira*. At least the latter proposal turned out to be wrong as I at that time did not give due consideration to the type of the scales and other characters as will be mentioned in the following.

In 1906 Börner believed himself to have rediscovered the genus in a species from British Central Africa, called *Pseudosira nyassica*. He pointed out that this form had rounded scales and that also the furcula was covered with scales and therefore placed *Pseudosira* as a subgenus to *Lepidocyrtus*. This arrangement of his was criticised by Wahlgren⁽¹⁾ who had worked up a large amount of material from Egypt and Sudan. Wahlgren deals with the question in the following way:—

“It seems quite impossible to keep *Lepidocyrtus* s. str. and *Pseudosira* even as subgenera, as Börner does. There is no marked differences between a protruding and a not protruding mesonotum as all intermediate states are to be found and the shape of the scales is considerably varying even on different parts of the body of the same individual.”

Wahlgren therefore out of pure practical reasons proposes to reduce *Pseudosira* and divide the genus *Lepidocyrtus* in two sections *Falciformes* and *Bidenticulati* in accordance with the shape and structure of the mucronal segment. This arrangement first appealed to me as justified as a means of getting out of the difficulties, and I therefore accepted it when working up Dr. Mjöberg's Australian material.

I have, however, now good reasons to change my opinion again. I have been fortunate enough to procure a couple of specimens of *Pseudosira elegans* from Camerun, about ten specimens of another species from the Amazon and several specimens from Borneo. A close comparison between those shows that *Pseudosira* must be kept up as a distinct genus, for which I would like to give the following diagnosis:—

Habitus *Sira*-like; Antennae four-jointed with II and III in full-grown specimens of equal size and IV slightly longer

(1) Apterygot. aus. Ägypt und d. Sudan (Results of the Swed. Zool. Exped. to Egypt and White Nile, 1901).

than III and provided with a retractile terminal organ. *Eyes* 8+8, the proximal ones distinctly smaller than the other ones, "maculae" oval. Claw-joints nearly straight, with a proximal double-tooth and two simple distal ones. Pseudonychids very indistinct, often growing together with the incrassated superior margin of the claw, empodial appendices straight, slightly rounded towards the tips, in extr. III longest.

Tibiae unjointed; there is a tibiotarsal, sensitive, incrassated seta, extending slightly above the proximal tooth of the claw. Furcula covered with scales, dental ring, often suddenly interrupted, mucrones falciform. Scales in the free margin rounded, with very fine striation. On the head and body robust club-shaped setae; a tuft of comparatively long, serrated setae on the apical segment. There are also long soft, feather-shaped hairs on Ant. II, Abd. IV and V and on the ventral side of the fork.

Remarks. It deserves to be mentioned that none of the authors except Börner refers to the retractile terminal organ of Ant. IV. Probably the organ has been overlooked, in spite of being very obvious at least in *Pseudosira elegans*. Upon the character of the interrupted, dental rings in the fork too much stress should perhaps not be laid. The rings do not disappear unnoticeably as in *Lepidocyrtus*, but intermediate states seem to occur. The diagnosis of the species ought probably to be based chiefly or entirely on the colour markings.

5. PSEUDOSIRA FASCIATA n. sp.

Diagnosis. Ant. I=1 : 0.35.

Ant. I : II : III : IV=1 : 1.65 : 1.75 : 2.75.

Abd. III : IV=1 : 3.

Manubr : Mucrodens=1 : 1.36.

Coloration. Honey-yellow, with a lateral black border from Th. III to Abd. III. On Abd. III, and sometimes also on II, the lateral spots continue over the dorsal side and form cross-bands; at the posterior margin of the big abdominal segment a lateral spot. Ant. II and III dark at the tips, IV entirely green-black.

Locality. A number of mostly damaged specimens from the jungle near Tutau River, a branch of the Baram River, Northern Sarawak.

Remarks. Börner's observations on *Pseudosira nyassica* of "IV mit Sinneskolben, Kopf, Mesonotum and die meisten Rückentheile mit Keulenborsten" and of "I : II : III : IV = 1 : 1 $\frac{2}{3}$: 2 : 2—22 $\frac{1}{10}$ " of the antennal formula agree well with my own. Undoubtedly also Imm's *Ps. indra* and Handschin's newly mentioned *Ps. domestica* (Nic.) C. B. are good species of this genus. Probably also Wahlgren's *Lepidocyrtus* species of the group "Falciformes" (except perhaps *L. traegaardhi*) belong here. Wahlgren points out that all "Falciformes" are richly covered with hairs, but says nothing in this respect about his only new species of the group "Bidenticulati."

Probably also Schäffer's *Lepidocyrtus falcifer* and my own *Lep. schäfferi* ought to be placed here, but decidedly not Schäffer's *Sira variabilis* as Börner suggests, and furthermore Ritter's both *Pseudosira* species.

LEPIDOSIRA n. g.

More or less *Sira*-like in appearance with jointed tibiae and retractile terminal organ on Ant. IV. Scales of varying types but generally pointed, with long internal distinct striation. Both manubrium and dentes covered by scales. Body richly hairy. Mucrones bidentate, with basal spine.

6. LEPIDOSIRA MONTANA n. sp.

Diagnosis. Ant. I = 1 : 0.40.

Ant. I : II : III : IV = 1 : 1.5 : 1.5 : 2.2.

Abd. III : IV = 1 : 4.62.

Manubr : Mucrodens = 1 : 1.28.

Mesonotum not protruding above the hind margin of the head. *Eyes* 8+8, normally placed. Ant. III consisting of two curved staffs within wavy skin-folds. Claws with three internal teeth, the proximal one double; pseudonychia distinct, reaching to the proximal double-teeth. The empodial appendix obliquely cut off, the ventral lamella extremely thin and distinctly serrated. The tibio-tarsal sensitive setae comparatively short and incrassated towards the apex. Immediately behind this there is an extremely long feather-shaped seta protruding. On the ventral side of the tibiae and amongst the serrated setae a single, pointed, simple and uncoloured seta directed obliquely forwards. The scales as a rule of the

pointed type, but also rounded ones occur, all with longitudinal striation. On the abdomen they are brown. On the head, antennae, legs and furcula only scales of the pointed type are to be found. On the antennae these scales protrude to the basal part of Ant. IV. On the manubrium they are vitreous, exceedingly thin, and noticeable only by means of powerful magnification. On dentes they are elongated, lancet-shaped and remind one of flattened feather-like setae. Mesonotum at the anterior margin with a tuft of setae and the apical abdominal segment with long feather-shaped setae with somewhat extended tips. There are also two pairs of extremely long serrated setae on each side of the abdominal segments IV and V.

Coloration. Yellowish-white, sides of head darkly pigmented. There is a conspicuous black border along the sides of the body, a dark basal ring on the antennae; Ant. I bronze-coloured, underneath with bluish shade, other joints dirty whitish.

The two joints with distal blue points and the two apical joints with proximal blue rings. Manubrium sprinkled with blue, dentes uniformly yellowish.

Locality. 1 large specimen (3 mm.) from the top of Mt. Murud, 7200 feet, a smaller one also from Mt. Murud, 6500 feet, and three smaller ones (2 mm.) from Mt. Dulit, 3000 feet. The latter three individuals are nearly white with narrow bands on the thoracic segments and brown scales and blue rings on the legs. They were taken by beating branches above an umbrella and occurred together with *Epimetrus mirabilis* n. g. n. sp. and *Bromacanthus handschini* n. g. n. sp.

EPIMETRURA n. g.

Diagnosis. Ant. I=1 : 0.58. .

Ant. I : II : III : IV=1 : 1.28 : 1.12 : 1.60.

Abd. III : IV=1 : 9.37.

Manubr : Mucrodens=1 : 1.18.

Mesonotum strongly protruding. Apical segment of abdomen with a finger-shaped appendix, separated by a joint from the segment. Antennae four-jointed, longer than half the body.

Eyes 8+8, divided into two groups, four in the upper one, three in the lower one on irregularly extended spots. Corner with a peculiar brown point,

Antorg. III consisting of two staffs within a wavy skin-fold. *Tibiae* two-jointed, the tibio-tarsal sensitive seta long and incrassated towards the apex. Opposite to this and on the underside of the joint there is a single long seta among the serrated ones.

Claws with a proximal double-tooth and two distal ones, pseudonychia big with a lateral appendix at the base; the empodial appendix obliquely cut off, the ventral lamella extremely thin and distinctly serrated.

Dentes unarmed, mucrones bidentate, with basal spine.

Scales extended, pointed, with elongate striation.

Hairs and scales only partly preserved. Some scattered slightly curved ones, flattened towards the apex, can be seen near the anterior margin of mesonotum. *Genae* thinly covered with long fine hairs, antennae and legs with long setae, directed forwards. There are also some excessively long feather-shaped setae on the femoral joints anterior part. The apical segments with several pairs of long feather-shaped seta. Apical appendix densely covered with scales and long serrated setae.

Furcula richly hairy. At the joint between the manubrium and dentes the hairs grow thicker and are arranged in groups.

7. EPIMETRURA MIRABILIS n. sp.

Coloration. The preserved specimen is yellowish-white with some odd beautiful blue dots on the antennae and the legs.

Length of body (except head) 3 mm.

Locality. One single specimen from Mt. Dulit, 3000 feet, together with *Lepidosira montana* n. sp.

Remarks. This very peculiar form approaches the genus *Lepidocyrtus* by the excessive development of the second thoracic segment but reminds one in all other points of *Sira*, as for instance in the type of scales, the two-jointed tibiae, the claws, etc. By the finger-shaped apical appendix it occupies an independent position. First I took this organ for an abnormally extended part of the apical segment itself. From this it is, however, separated by a distinct joint. A similar appendix has been described by Inams from another Collembola form which he calls *Heteromuricus crucifer*, which, however, has entirely differently shaped antennae and abdomen,

TRIBUS ORCHESELLINI.

DICRANOCENTRUS Schött.

Through Mr. Georg Waldau I have received new Collem-bola-material from Cameroon, and have there rediscovered the form *D. gracilis*, described by me thirty years ago and also another interesting species.

A comparative study of this as well as other material from Borneo, Sumatra and Meru enables me to give a complete diagnosis of the genus as follows:—

Mesonotum not protruding over the posterior margin of the head. Abd. IV only slightly longer than III. Apical segment sometimes rounded, sometimes extended. Antennae longer than half the body with a basal ring and six joints, of which the fifth is extremely long and annulated like the apical joints. Eyes 8+8. Dentes with or without spines, mucrones bidentate, with basal spine. Scales brown, varying in shape but mostly rounded in the free end. Sculpture as in *Lepidocyrtus* but much more distinct and with faint concentric transversal lines at the base of the scales. On the anterior margin of mesonotum there is a group of robust, serrated, brown setae. Curved setae are to be found near the anterior margin of the head and partly covering the base of the antennae. Similar setae cover also Ant. I and II, where also very long protruding, simple, vitreous setae can be seen. On the back-side of the trochanter of the third pair of legs transparent sensitive setae are found.

8. DICRANOCENTRUS SUNDANENSIS n. sp.

Diagnosis. Claws with exceedingly small teeth, very easily overlooked; with one proximal double tooth and one simple one; pseudonychia small, empodial appendix lancet-shaped, its ventral lamella with a hardly noticeable tooth, which is longer on the third pair of legs. Tibio-tarsal sensitive setae comparatively short, ending pointed. Dental spines arranged in three parallel rows, the spines of the external rows very big, all slightly curved.

Coloration. Ground colour light nearly white, but the scales give the animal a shade of brown. The basal ring of antennae dark, Ant. I and II dark brown with a bluish-black distal ring. In Ant. III the bluish pigment is more diffuse. Ant. V is greyish shining with a nearly black proximal spot.

Legs with scattered blue spots on the upper joints, tibiae entirely blue.

Length of body 3, 5—4,00 mm.

Locality. Mt. Murud, 6000 feet, 3 specimens.

Remarks. The species comes nearest to Wahlgren's *D. meruensis*. This has also the dental spines arranged in three parallel rows, but not quite so regularly, and the external spines are not so big and are less curved than in the Bornean species.

TRIBUS PARONELLINI.

Quite recently Dr. E. Handschin has proposed to split up the species of my genus *Paronella* into four genera. His step seems to me justified and offers no considerable difficulties in placing the species known up to now. The difference between *Paronella* s. str. and *Aphysa*, however, appears a bit too vague to adhere to strictly in future if decided only by the number of mucronal teeth. Perhaps some additional characters could be discovered in the shape and structure of the scales. At present I have not sufficient material to enable me to draw any definite conclusions. I hope, however, to be able to ventilate the question more in detail, when working up a collection from Camerun. Here it might only be mentioned that a typical *Paronella* species, *P. nigromaculata* has thin, broad, in the free end rounded scales, with very fine striation and perhaps the species has this character in common with other true *Paronella* species. In all other forms of the group the scales are narrow, pointed, densely pubescent, approaching scuated setae.

Also the following points of view may be referred to here.

Dr. Handschin asks me in a letter if in reality those described by me as *Pericrypta mjobergi* are covered by scales. If so it would be a welcome guest among the forms included in the new genus *Pseudoparonella*. On account of his inquiry I have thoroughly re-examined twelve specimens, but failed to discover a single scale. I should like to add that I do not consider it advisable any longer to maintain Ritter's generic name *Pericrypta* for the Australian species as this forms a confusion of two different genera. I therefore propose to change it to *Paronellides*, which name seems to express adequately the position of the Australian form.

With reference to *Paronella appendiculata*, Handschin states that this species had not been examined as to the occurrence or the absence of dental spines. In my description I say the following :—

“Hinterrand der Dentes mit einer Reihe Wimperborsten von demselben Typus wie die zwei Distalborsten,” and that is all that can be said about the thing. No spines occur.

APHYSA Handsch.

In Dr. Mjöberg's collection from Mt. Murud there are eight specimens which undoubtedly have to be referred to that section of the genus *Paronella*, which Handschin comprises under the new genus *Aphysa*. On account of its great variability this species has caused me great trouble to classify. The antennae of nearly all specimens are broken, and the joints left vary in length as do also the colour and the size of the tergites, dentes and mucrones.

Some specimens are yellow with distinct black cross stripes, others show no markings whatsoever, some have Ant. I about twice as long as the diagonal of the head, whereas in others these two segments are nearly of the same length. The mucronal segments are in some individuals comparatively short and broad (dentes about fourteen times longer than mucrones), in other ones long and narrow (dentes about eleven times longer than mucrones). The most peculiar variation is, however, that in certain individuals the dental segment are armed, in others unarmed.

It seems perhaps simple to divide up the material into two different species for instance one with distinct crossbands, long antennae, armed dental segments and short mucrones, another one with indistinct or no markings at all, short joints of antennae and long mucrones, which should have been good enough, if the variations had gone parallel as mentioned just now.

But only the characters unarmed dentes and long mucrones on one side and armed dentes and short mucrones on the other correlate with each other; all other characters vary independently of each other and also of those just mentioned.

9. APHYSA DUBIA n. sp.

Extremes of variations in the relative size according to measurement of all individuals.

Diagnosis. Ant. I=1 : 0.84--1 : 2.10.
 Ant. I : II=1 : 0.75 - 1 : 2.05.
 Abd. III : IV=1 : 5.40 - 1 : 6.87.
 Manubr : Mucrodens=1 : 1.44 - 1 : 1.80.

Eyes 8+8; proximal ocelli smaller than the other ones.

Antennae of medium length, of about the same length as the body judged from a single individual, which, however, has one joint abnormal.

Claws with a proximal double tooth and a simple distal one. Pseudonychia distinct, empodial appendix with a upstanding toothlike formation at the middle of the internal side which is longer in the third pair of legs than in the other ones.

Tibial sensitive seta with a distinct incrassation, which does not extend to the middle of the claw. Furcula without dental vesica, with a double row of dental spines which, however, sometimes seem to be absent; mucrones with six teeth and basal spine.

Scales small, pointed, pubescent. Body covered with small black, serrated setae, especially richly developed on the strongly pigmented cross-bands and other darker spots. On the ventral side there are fairly long and densely arranged feather-like setae.

The living animal probably has the head covered with strong setae, directed forwards and incrassate in the ends. In one individual a single such one can be seen. A ring of strong apical setae protrude as spears over the posterior margin of the head, originating from the anterior margin of mesonotum.

Coloration. Yellowish dark markings, head to a great extent black-pigmented, mesonotum with a broad indistinctly limited cross-band, posterior half of mesonotum with a more narrow one. There are also strongly marked cross-bands on Abd. III all along the segment, in the middle of Abd. IV and on Abd. V and VI. On Abd. IV there are big lateral markings, with vague contours sometimes extending into a broad vague fascia across the posterior part of the segment. Legs dark with lighter coloured tibiae; antennae and furcula light.

In another form the body lacks markings almost entirely, being only slightly shadowed. The two first joints of antennae bronze coloured, with bluish-green rings at both ends and an irregular dark marking in the middle; tibiae bluish-green, manubrium yellow; dentes pale bluish-green.

To these two colour variations most individuals can be referred.

Length of body 3 mm.

Locality. Mt. Murud, 6500 feet.

Remarks. The species reminds me in its shape of the mucronal segment of *A. longicornis* but is well separated by its shorter antennae and the occurrence of dental spines.

One cannot be too careful when examining and drawing the mucronal segment of the *Aphysa* species as in different positions of the object and at different degrees of magnification one gets the most different pictures. One figure is given here taken at normal magnification and two other ones taken with use of oil immersion. In the first all dentes and lateral processes are plainly visible.

DICRANOCENTROIDES Imms.

10. DICRANOCENTROIDES ARGENTATUS n. sp.

Of this very interesting form there are two individuals of somewhat different size. The segmental formulae are as follows:—

Diagnosis. Ant. I=1 : 0.85.

Ant. I : II : III : IV=1 : 0.64 : 0.96 : 1.

Abd. III : IV=1 : 13.33.

Manubr : Mucrodens=1 : 1.14.

Eyes 8+8, arranged in two parallel rows. Thanks to the thin pigment they are visible without the use of extra methods. Their relative size I cannot fix.

Antennae longer than half the body, in shape, colour, etc., quite peculiar. Ant. I and II are thick and dark brown and the two apical joints narrow and nearly pure white.

All joints are covered with a bottom layer of brown feather-shaped setae, which become shorter on the apical joint. Ant. I and II are also provided with big tufts of strong brown plainly serrated setae and from Ant. II and III some uncoloured long setae of the same structure are seen extending in oblique directed downwards. The two apical joints are furthermore covered with fine vitreous sensitive setae, which are placed at a certain distance and at right angles towards the joint. Upper claw with pseudonychia, a proximal double tooth and a distal simple one; empodial appendix lancet-shaped. The tibio-tarsal sensitive seta comparatively short, distinctly incrassate. The two segments of furcula of the same length; dentes parallel, slightly tapering downwards. On the internal side they are

armed with a double row of simple spines and covered with scales and thin feather-shaped setae. It seems impossible to fix the lower limit of the rows of spine as the spines downwards become bigger and go over into long spine-like setae; mucrones short and broad, the dorsal position rounded above; from here an apical blunt tooth and two ventral ones, of which the lower one is broad and lamella-shaped, are seen protruding; further down there is a slightly curved basal spine; lateral appendix indistinct.

Coloration. In specimens preserved in alcohol the ground colour seem to be dark honey-yellow. The markings consist of a faint black margin on the ventral margin of mesonotum and strong, irregular borders on or near the posterior margins of Abd. IV and V. The ventral side of the big apical segment is dark brown as also the whole of the apical segment.

On the living animal Dr. Mjöberg has, according to a note in the tube, observed two silver-shining greenish lateral bands. Also the interstices between the hair tufts are silvery shining.

The length of the animal from the tip of mesonotum to the furcula is 3—4 mm.

Locality. Mt. Dulit, N. Sarawak, 3000 feet.

Biology. In the above-mentioned note Dr. Mjöberg remarks, that "this species strikingly imitates certain small, narrow spiders by stretching straight forwards the lightly coloured antennae, which are constantly moved, thereby giving exactly the impression of a spider and its palpi. It was observed on the leaves of a shrub, displaying in the direct sunlight, an extraordinary habit of a Podurid."

Remarks. Other species belonging to this genus are *Paronella plumicornis* (Par.) *D. fasciatus* Imms and *D. longiceps* recently described by Handschin. Judging from the description of the mucronal segments of the latter species, it seems to come nearest to the Mt. Dulit species, but differs, however, by the monstrous head.

Though the species just mentioned in their organisation show many peculiarities in common, justifying the creation of a separate genus (as done by Imms) the choice of name seems to me a bit peculiar, as there is no affinity whatsoever with the genus *Dicranocentrus*. No doubt the discussed forms come nearest to the species of the genus *Aphyusa*. This is evident from the shape of the scales but above all from the appearance of the mucronal segment of the species described by Imms.

BROMACANTHUS n. g.

Body elongate, narrow, somewhat sinuate on the dorsal side between Abd. III and IV. Antennae nearly of the length of the body, the apical joint slightly annulated.

Antennal organ II consisting of two free staffs and Ant. organ III of two staffs within a skin-fold. I have not been able to discover any terminal organ on Ant. IV.

Eyes 8+8, the proximal ones distinctly smaller than the others, placed on oval spots with irregular contours; claw joints slender, upper claw with a proximal double tooth and a distal one; pseudonychia small, easily overlooked. The empodial appendix concave, the tips of it curved upwards on the two first pairs of legs and reaching to the proximal tooth of the upper claw, on the third pair of legs longer and extending to the distal tooth. Tibiotarsal sensitive setae incrassate towards the apex, thin and reaching to the distal tooth. The hind legs possess on the interior side of the femur a mysterious organ consisting of two rows of dark skin pieces. In most of the individuals examined these are spiral-shaped and their edges undentate. Only in one specimen they seem to be spoon-shaped with serrated margins. It is possible that this femoral organ has something to do with the feeling.

Furcula with nearly parallel sides, manubrium slightly shorter than dentes, which on the inside are armed with two double rows of spines, one dorsal and one ventral. The spines of the dorsal row are robust, and split up at the base in such a way, that they strikingly remind one of an open ear of oats (hence the name). They are erect and are combined with obliquely-placed, nearly needle-shaped smaller spines. In the ventral row the spines are slightly longer, very sharp and directed downwards and also combined with smaller spines. All spines, also the smaller ones are more or less split up in a characteristic way. Mucrones indistinctly set off from dentes, as long as broad, with three teeth, of which the middle one is bigger than the other ones and curved upwards.

Scales thin, brownish, in the free end mostly circle round, sometimes with irregular contours, but never sharp. They are very finely striped and continue on the antennae right out to the terminal joint. Hairs on the abdomen badly preserved. There is a tuft of setae at the sides of mesonotum, thinly placed longer setae on the ventral side of the big abdominal segment and some stronger setae on the apical segment.

Antennae and legs normally hairy. The distal end of manubrium near the dentes with a row of down-hanging, very strong feather-shaped setae; dentes also with long, thin, feather-shaped setae, but also with some odd, very stiff, pointed, serrated ones. Near mucrones there are two or three double-contoured very strong down-hanging setae.

11. *BROMACANTHUS HANDSCHINI* n. sp.

The colour in specimens preserved in alcohol nearly pure white with some blue-pigmented distal dots on Ant. III, Ant. IV, entirely bluish.

Length of body 2 mm.

Locality. About thirty specimens from Mt. Dulit, 4000 feet, and a single one from the same mountain, 3000 feet. They lived on bushes and were got by shaking the branches over an umbrella (Mjöberg).

Remarks. When examining this species I first thought to have to do with a species of the genus *Paronella*, but the peculiar shape and distribution of the dental spines, the mysterious femoral organ and the presence of antennal sensitive organs necessitate the creation of a new genus. A deciding factor should have been the secondary articulation of the apical antennal joint, but I am not in the position to say anything definite concerning this characteristic. Only very few specimens with antennae in fact are accessible and in a couple of those I believe I can see distinct annulation on Ant. IV., but in another specimen the picture is indistinct.

It deserves to be mentioned that in several individuals there is a peculiar anomaly in the antennae: Ant. III is either entirely missing or at least strongly reduced.

In the former case only the longer, not annulated basal part of Ant. IV gives the impression of a joint of its own. Also the supposed joint-suture towards Ant. IV is very indistinct and the segment itself has no sensitive organs at all.

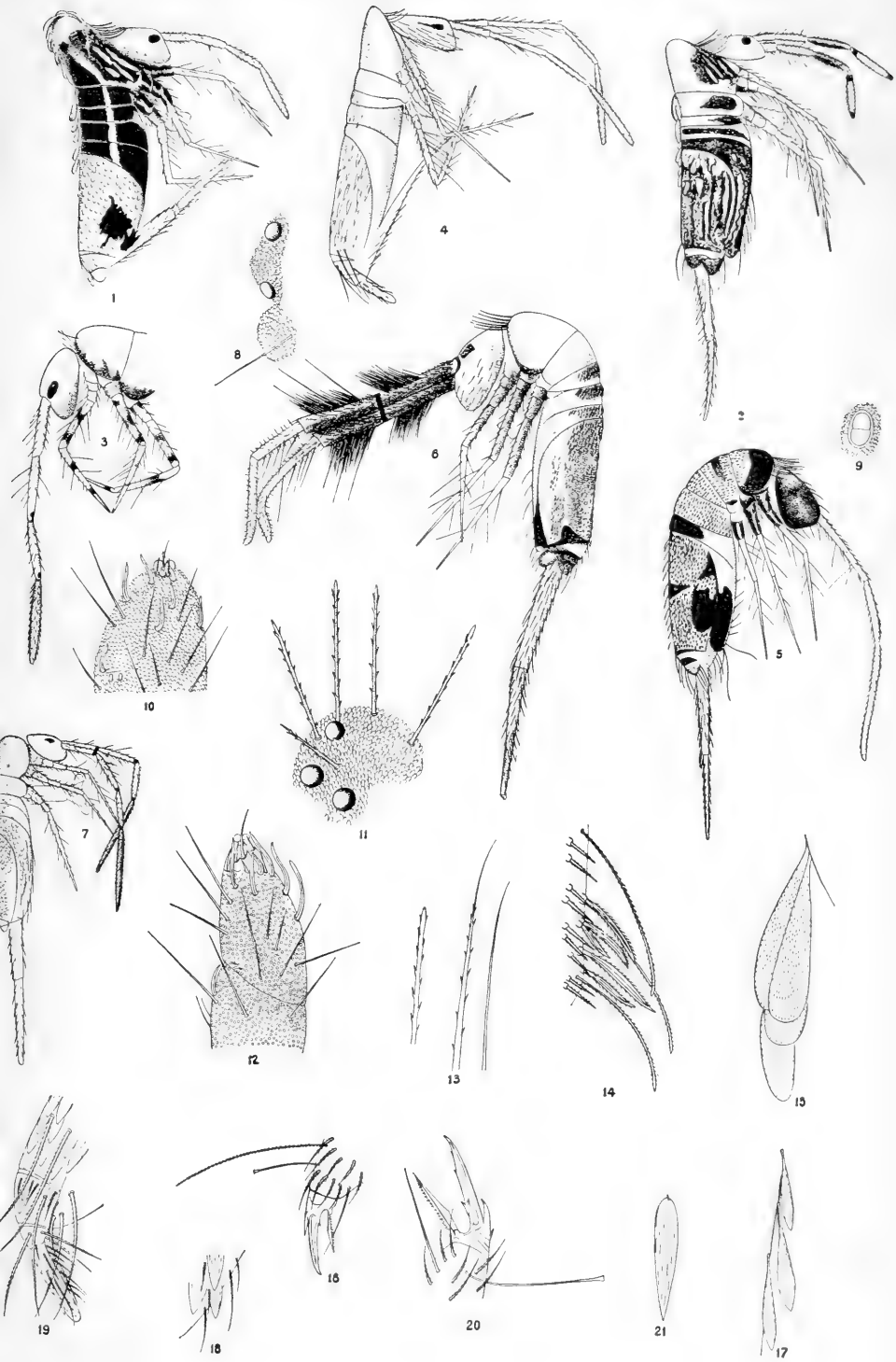
12. *CYPHODERES SERRATUS* Schött.

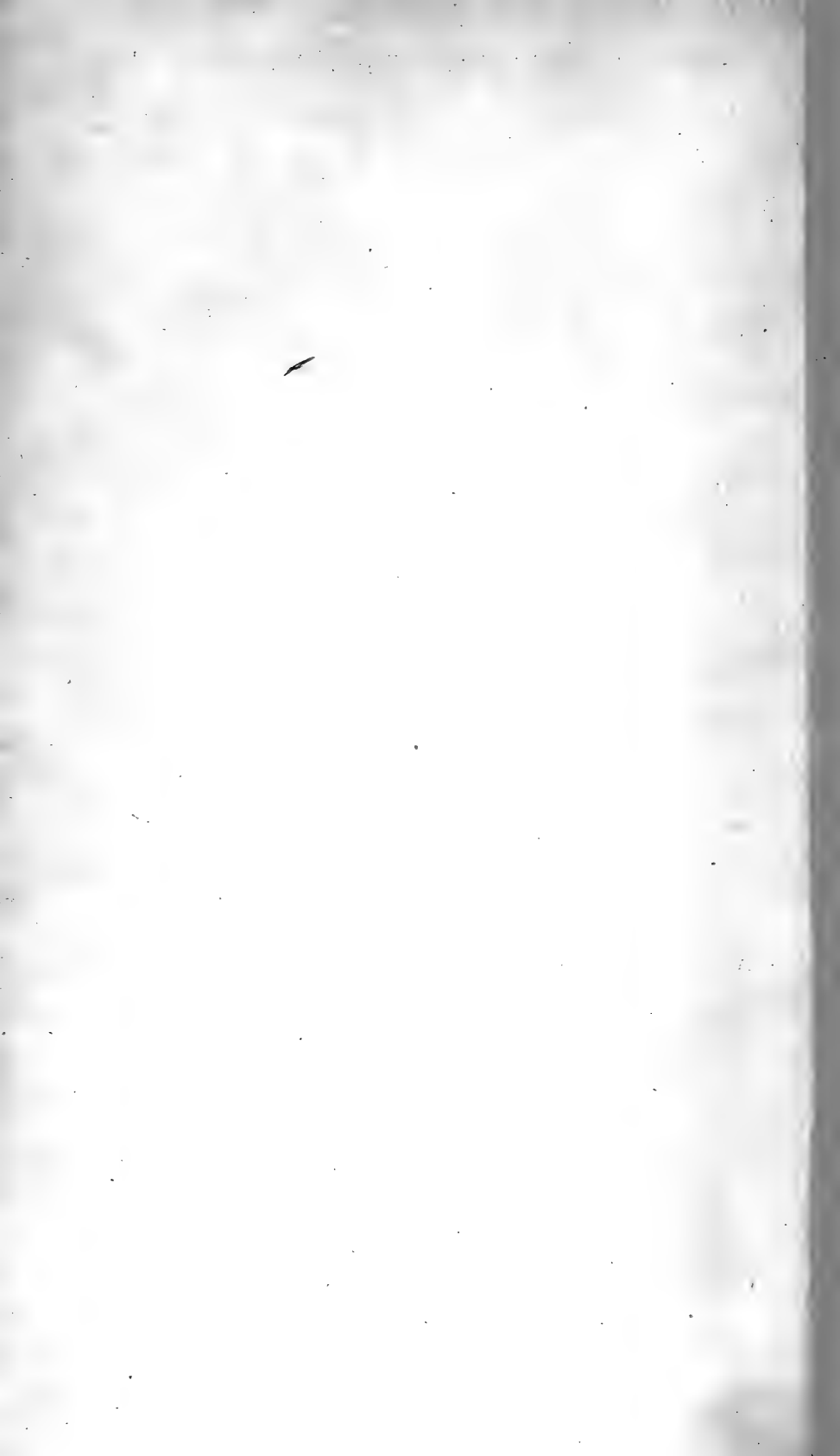
In Dr. Mjöberg's collection there are five specimens from Mt. Dulit of a form which I must regard as identical with the species described by me from Australia under the above name. A detailed comparison with Australian individuals shows no differences. The species is so characteristic as to preclude any mistake.

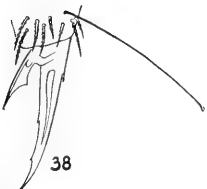
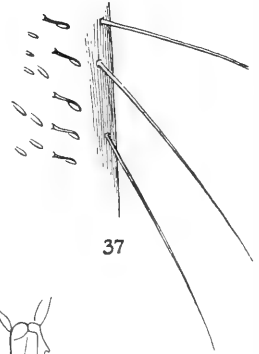
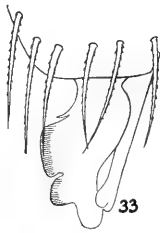
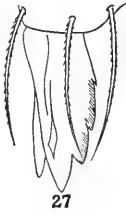
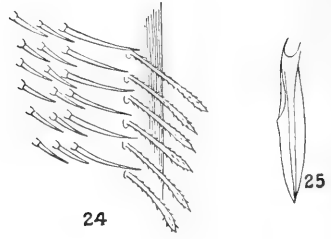
Remarks. The asymmetry in the suture of the claws which Börner mentions in his *C. albinos* does not occur in my species, in which two big quite symmetrically placed teeth are found near the internal margin.

Explanation of Plates 4 and 5.

- Fig. 1. *Acanthurella zonata* n. sp.
 „ 2. *Acanthurella glauca* n. sp.
 „ 3. *Lepidosira montana* n. sp.
 „ 4. *Aphysa dubia* n. sp.
 „ 5. *Dicranocentroides argentatus* n. sp.
 „ 6. *Bromacanthus handschini* n. sp.
 „ 7. „ „ „ „
 „ 8. Ocelli in situ of *Achorutes semilunaris* n. sp.
 „ 9. Ocellus „ „ „ „
 „ 10. Ant. IV „ „ „ „
 „ 11. Group of ocelli of *Achorutes bornensis* n. sp.
 „ 12. Antennae „ „ „ „
 „ 13. Setae „ „ „ „
 „ 14. Dens furcula of *Acanthurella zonata* n. sp.
 „ 15. Squamae „ „ „ „
 „ 16. Claw of 3rd pair of legs of *Lepidosira montana* n. sp.
 „ 17. Squamae of dentes „ „ „ „
 „ 18. „ „ manubrium „ „ „ „
 „ 19. Apical appendix of *Epimetrura mirabilis* n. sp.
 „ 20. Claw of 3rd pair of legs „ „ „ „
 „ 21. Squamae from the body „ „ „ „
 „ 22. Ocelli „ „ „ „
 „ 23. Claw of 3rd pair of legs of *Dicranocentrus sundanensis* n. sp.
 „ 24. Dens furculae „ „ „ „
 „ 25. Empodial appendix of 3rd pair of *Aphysa dubia* n. sp.
 „ 26. Squamae of body „ „ „ „
 „ 27. Mucro viewed from the internal side „ „ „ „
 „ 28—29. Mucrones „ „ external „ „ „ „
 „ 30. Dental spines „ „ „ „
 „ 31. Dental spines of *Dicranocentroides argentatus* n. sp.
 „ 32. Squamae from the body „ „ „ „
 „ 33. Mucro „ „ „ „
 „ 34. Mucro of *Dicranocentroides plumicornis* (Par.).
 „ 35. Mucro of *Bromacanthus handschini* n. sp.
 „ 36. Dens furculae of „ „ „ „
 „ 37. Femoral organ of „ „ „ „
 „ 38. Claw of 3rd pair of legs of „ „ „ „
 „ 39. Claw-joint of *Cyphoderes serratus* Sch.
 „ 40. „ „ from underneath of *Cyphoderes serratus* Sch.
 „ 41. Mucro „ „ „ „









Vol. III. (Part II.)

No. 9.

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ERRATA.

In a paper on Blattidae from N. Sarawak, by Dr. R. Hanitsch, published in the Sar. Mus. Journ. Vol. III. (Part I.) No. 8, 1925, p. 75, the following corrections are to be noted:—

- p. 78, line 5 from top: for "*Dyscologomia*" read "*Dyscologamia*."
- p. 88, line 10 from bottom: for "and" read "anal."
- p. 91, line 6 " " for "impresso-impunctate" read "impresso-punctate."
- p. 95, line 4 " " for "maxiillary" read "maxillary."
- p. 98, line 15 " " for "in the length" read "in length."
- p. 103, in explanation to fig. 15: for "♀" read "♂."

X.—On some Families of Heterocera collected in Sarawak. By G. TALBOT, F.E.S.

(With one Plate.)

The material* dealt with in this paper was collected by Dr. Mjöberg mainly on the mountains of Dulit, Murud, Poi, and Penrissen. The collections of Heterocera are of much interest as little is known of the Heterocerous fauna of these Sarawak mountains. Sixteen new forms are herein described, besides the undescribed sex of five other forms.

The types of forms described herein are deposited in the Hill Museum, Witley, Surrey, where they are available for study at any time. These types will pass into the possession of the British Museum when the Hill Museum ceases to exist.

The remaining families of Heterocera are dealt with in other papers by Mr. L. B. Prout, Miss A. E. Prout, Mr. E. Meyrick, and Prof. Janse.

The types of forms described by the first two are in the Hill Museum and those described by other authors are in their own collections.

*The Rhopalocera collected by Dr. Mjöberg were also forwarded for identification. They comprise 34 species, all well-known and for the most part common species, which need no comment.

One Lycaenid, *Lampides lividus* Druce, however, is worthy of record. A ♂ was taken on Mt. Dulit and appears to be the second specimen known. Druce described it in 1895 from Labuan. (P.Z.S., Vol. xxxii, p. 584).

AMATIDAE.

1. *CALLITOMIS MJÖBERGI* sp. n.

This species is distinct from any known form. ♂. Wings and body the colour of old gold (see Ridgeway "Color Nomencl." pl. xvi). Fore wing:—Costa narrowly black, fringe of outer margin black to below the tornus. The cell, cellule 1c from base to vein 2, and the bases of cellules 2-4 hyaline, the spots 2-4 separated from the cell by black scaling which extends over the discocellulars; cellule 6 slightly hyaline over the basal half. Veins scaled with black and some black scaling in cellule 5. Hind wing with the discal area hyaline, extending to below the submedian to half of cellule 2 and the basal part of cellule 3. Fringe black from tornus to middle of costa.

Underside fuscous, fringes and costa of fore wing black as upperside. Fore wing with markings of old gold, a narrow costal stripe, cellule 6 of this colour, the distal part of cellule 7, slight scaling in 4, marginal scaling in 3, a marginal spot in 2 and 1b. Post-discal hyaline spots in 2-4 well marked with slight distal edging of old gold. Hind wing with proximal half of costa old gold, also the proximal two-thirds of cell, a stripe in cellule 4, the inner margin and distal margin as above, but with fuscous scaling in cellule 2.

Antennae black, whitish at the tip; palpi black; frons grey-white; head, thorax and abdomen old gold. Abdomen with segments 2-4 and 7 edged with fuscous; anal tuft fuscous. Legs fuscous, femora marked with old gold.

♀. Similar to the ♂ and with a simple frenulum. Fore wing with the hyaline area below the cell broken in the middle. Spots in 2-4 less hyaline. An ill-defined post-discal fuscous band parallel to the margin from 1b to 6. Fringe of the inner margin black. Hind wing below with distal half and subcostal area fuscous. Abdomen with the basal half of ventral surface fuscous with only slight scaling of old gold.

Two specimens (6500 feet) resemble the ♂ but with larger vitreous areas.

Length of fore wing ♂ ♀ 18 mm.

Mt. Murud, 6500 feet, October—4 ♂, 2 ♀; November—2 ♂, 1 ♀.

2. AMATA ELIZA Btl.

Syntomis eliza Butl., Journ. Linn. Soc. Zool., xii, p. 377, 1876, Sarawak.

Mt. Penrissen, 3500 feet—1 ♂, 2 ♀.

3. AMATA DILATATA Snell.

Syntomis dilatata Snell., in Veth's midden-Sumatra, Lep., p. 33, 1880, Nias.

Mt. Penrissen, 3500 feet—2 ♂.

ARCTIIDAE.

NOLINAE.

4. CELAMA MARMOREA sp. nov.

Possibly a race of *tesselata* Hmp.

♀. Distinguished from *tesselata* by the narrower dark markings. Fore wing with a narrow discal band which is not conjoined to a patch on the margin. A post-discal line angled at vein 5 and joined to the discal band at vein 3. A dark subapical costal patch on the post-discal line. A large patch on the outer margin almost touching the post-discal line. The markings are dark brown as is also the fringe except at tornus. Hind wing white tinged with fuscous. Underside fuscous, hind wing whitish in basal half. Body and appendages marked as in *tesselata*.

Length of fore wing 7-5 mm.

Mt. Dulit—1 ♀.

5. CELAMA DUPLICILINEA Hmps.

Cat. Lep. Phal., ii, p. 12, pl. xviii, fig. 8, 1900, Sikkim.

Mt. Murud, 6000-6500 feet, October—1 ♂, 1 ♀; November—1 ♂.

6. CELAMA POLIA Hmps.

Cat. Lep. Phal., ii, p. 28, pl. xviii, fig. 22, 1900, Sikkim.

Mt. Murud—1 ♂.

7. CELAMA PHACOCHROA Hmpsn.

Cat. Lep. Phal., ii, p. 29, pl. xviii, fig. 24, 1900, Sikkim, Java.

Lio Matu, December—1 ♂, 1 ♀; Mein Plateau, November—1 ♂; Mt. Murud, 6000-6500 feet, October—1 ♂; November—2 ♂.

8. *NOLA ARGENTALIS* Mre.

Aglossa argentalis Moore, P.Z.S., p. 89, 1867, Sikkim.

Mt. Murud, 6000--6500 feet, November—1 ♂, 5 ♀.

9. *NOLA TRISTICTA* Hmps.

Cat. Lep. Phal., ii, p. 37, pl. xix, fig. 4, 1900, Sikkim, Assam.

Mt. Murud, 6500 feet, November—1 ♀.

10. *NOLA MICROPHASMA* Butl.

Cist. Ent., iii, p. 177, 1885, Japan.

Mt. Murud, 6000--6500 feet, November—1 ♀.

LITHOSIANAE.

11. *LAMBULA PALLIDA* Hmps.

Cat. Lep. Phal., ii, p. 100, pl. xx, fig. 18, 1900, Borneo.

Mt. Murud, 6500 feet, November—1 ♀.

Compared with the type this is a strongly marked specimen

12. *TIGRIOIDES SUFFUSUS* sp. nov.

Allied to *leucanioides* Walk.

♀. Fore wing greyish-white with fuscous markings. A narrow elongate spot on costa about midway. Basal half below the cell suffused with fuscous which also edges veins 2 and 3. Apical area slightly suffused to the upper angle of cell. Hind wing semi-hyaline with a brownish tinge. Antennae brown. Head pale buff; palpi yellowish-brown, terminal segment fuscous. Thorax and abdomen pale brown, legs pale brown.

Length of fore wing 14 mm.

Mt. Dulit, 3000 feet—1 ♀.

13. *MITHUNA QUADRIPLAGA* Mre.

P.Z.S., p. 21, 1878, Darjiling.

Mt. Murud, 6000--6500 feet, October—1 ♂; November—1 ♂, 2 ♀.

14. *ILEMA PLAGIATA* Walk.

Teulisna plagiata Walk., Journ. Linn. Soc. Zool., vi, p. 109, 1862, Sarawak.

Mt. Penrissen, 4400 feet—1 ♀.

15. *ILEMA CURVIPLAGA ruptifascia* subsp. nov.

♀. The curved band on the fore wing is more distinctly angled than curved at cellule 2 from whence it is straight and oblique to the margin. A less strongly-marked black post-discal band interrupted in cellule 4. and with a distal projection in cellule 3.

Hind wing fuscous, yellowish-white in the basal area. Abdomen fuscous.

Mt. Murud, 6500 feet, November—2 ♀.

16. *ILEMA BREVIPENNIS* Walk.

Cat., ii, p. 509, 1854, Ceylon.

Mt. Dulit—1 ♂.

17. *MONOSYNTAXIS TRIMACULATA* Hmps.

Monotaxis trimaculata Hmps., Cat. Lep. Phal., ii, p. 181, 1900, N. Borneo ♀.

♂ not described.

Resembles the ♂ of *holman-hunti* Hmp. from Selangor, but the collar is orange and the basal spot elongate.

Fore wing deep purplish-blue, basal orange spot elongate. Hind wing black-brown with faint purplish tinge. Underside black-brown.

Antennae brown, shortly bipectinate. Palpi orange-yellow. Head and thorax black with a dark blue sheen, collar orange. Abdomen fuscous-black above, yellow below. Pectus yellow. Fore and mid femora yellow, tibiae and tarsi bluish-black, hind legs yellow.

Length of fore wing 16 mm.

Mt. Penrissen, 4400 feet—1 ♂.

18. *AGYLLA MJOBERGI* sp. nov.

A distinct species belonging to section 1 of Hampson (Cat. Phal., 2).

♂. Fore wing dark violet-blue with a purple tinge; an orange costal stripe from the base to near the apex, but basal third of costal edge blue-black. A pale yellow spot at extreme base of inner margin. Hind wing yellow-ochraceous, paler along the costal area.

Underside of fore wing fuscous, with a yellow costal stripe, and the inner area below submedian fold paler than the ground-colour. Hind wing as above but with a black costal stripe reaching to the cell and vein 6.

Antennae fuscous-black, branches brown. Head and palpi bluish-black; tegulae orange; patagia metallic blue mixed with purple-violet. Abdomen ochraceous-yellow. Femora ochraceous-yellow; fore and mid tibiae and tarsi bluish-black; hind tibiae and tarsi ochraceous-yellow; pectus ochraceous-yellow.

♀. Resembles the ♂. Fore wing violet-grey with a pale square-shaped apical area. The costal stripe paler orange, reaching the costal edge from the base and narrowing to the apex. Hind wing paler than in the ♂.

Underside paler than in the ♂. Fore wing with the ground-colour grey, and the pale area of the upperside defined by pale-yellow.

Frons and palpi orange, vertex violet-blue.

Length of fore wing ♂ 17 mm., ♀ 19 mm.

Mt. Poi, 5200 feet—2 ♂ (Type), 1 ♀; Mt. Penrissen, 4700 feet—1 ♀ (allotype).

19. AGYLLA BISECTA Roths.

Nov. Zool., xix, p. 226, 1912, N. Borneo.

♂. Apparently undescribed.

Fore wing grey, some white scaling over the distal area between costa and vein 3; costal stripe as in the ♀. Hind wing paler than in the ♀.

Underside as in the ♀, fore wing darker, hind wing paler. Submedian with a fold showing a stripe of closely-set brown scales; the submedian area black by a mixture of black scales, and much enlarged, the inner half folded over on the underside.

Length of fore wing 18 mm.

Mt. Murud, 6000--6500 feet, November—9 ♂, 3 ♀.

20. PADENIA DUPLICANA Walk.

Tospitis duplicana Wlk., Cat. Lep. Het. B.M., xxviii, p. 429, 1868, Sarawak.

Mt. Dulit, 3000 feet—1 ♂; Mt. Poi, 2000 feet—1 ♂; Mt. Penrissen, 2000 feet—1 ♀.

21. SCAPTESYLE TRICOLOR Walk. *dentata*, subsp. nov.

♂. Fore wing with the black post-discal line more strongly angled in cellule 6, forming a well-marked tooth. The brown marginal area is a little narrower. Hind wing with a narrower marginal border which only reaches vein 2.

Mt. Murud, 6000--6500 feet, November—1 ♂.

The species is diurnal.

22. *UTRICULIFERA FUSCAPEX* Hmps.

III. *Het.*, ix, p. 82, pl. 158, figs. 7, 17, 1893, Ceylon.

Mt. Poi, 4300 feet—1 ♂.

23. *CHIONAEMA CRUENTATA* sp. nov.

This species belongs to section Bb of Hampson (*Lep. Phal.* ii.).

♂. Fore wing with outer part of lobe large and rounded, inner part smaller and triangular. No fringe of hair on the underside. Costal fringe moderately long. Vein 4 obsolete for a short distance from the margin. Fore wing white. A sub-basal crimson band broadening on the costa; a crimson discal band edged with black on the inside and inwardly curved; a crimson post-discal band edged with black on the outside, inside edge rounded below vein 4 and fairly straight on the outside. Outer margin broadly washed with pale orange-yellow. A black dash in the end of cell and two black discocellular dots.

Hind wing white, tinged with yellow at the termen and inner margin. Underside white, tinged with yellow on the costal and apical areas. Fore wing with lobe crimson and some crimson scaling in the cell.

Head and thorax white marked with crimson; neck crimson, tegulae and patagia edged with crimson; antennae brown; palpi crimson. Legs orange-yellow marked with crimson and white; pectus and abdomen white, and tuft pale buff.

♀. Similar to the ♂ but fore wing with one discocellular spot besides the dash. Outer margin with a broad and strongly marked orange-yellow band, shading into crimson on its inner edge. Hind wing more strongly tinged with orange-yellow than in the ♂. Underside of both wings strongly tinged with dull crimson. Antennae crimson. Abdomen with the three end segments below yellow.

Length of fore wing ♂ 15--18 mm., ♀ 19.5 mm.

Mt. Poi, 5900 feet—1 ♂ (Type); 5200 feet—2 ♂, 1 ♀ (allotype).

24. *CHIONAEMA RHADOTA* Swinh. *borneensis* subsp. nov.

♀. Fore wing with a broader red marginal band. The post-discal red band is broader and almost touches the black discocellular dot. The black post-discal line straighter and very slightly curved out below vein 5.

Mt. Poi, 2000 feet—2 ♀.

25. *PARASICCIA MARGINIPUNCTA* sp. nov.

This species agrees with the genus *Hyposiccia* in having vein 11 anastomosing with 12, but the palpus is longer and reaches well to the vertex of the head. Veins 4 and 5 of the fore wing are separated at their origin.

♂♀. ♂ with antennae bipectinate with moderate branches. ♀ antenna serrate with fascicles of cilia.

Fore wing white with blackish-brown lines and spots. A dot at the base and one at base of cell. A spot on costa near base, a larger one beyond it from which runs a discal line; discal line curved outwards to edge of cell and thence straight and directed inwards to inner margin, accentuated by a dot on lower edge of cell, one on submedian, and one on inner margin. A rounded spot in middle of cell, and one on the discocellular. Two post-discal lines separated by a space less than the distance between cell-spot and discocellular spot. These lines are accentuated by costal spots from which they curve outwards to margin of cell and vein 7, thence incurved to vein 4, the inner one broken by the discocellular spots, and directed obliquely inwards to the inner margin on which they bend slightly outwards; these lines are accentuated by dots on the veins. A submarginal line of spots on the veins, the one at the apex being larger. A series of 6 marginal dots between the veins, interspace 3 without a dot. A slight brownish marginal suffusion between vein 4 and the apex. Hind wing white with a slight brown tinge.

Underside white with a brown tinge. Antennae, head, thorax, and abdomen grey-white. Palpi grey-white, black at the sides. Legs grey-white, fore and mid legs marked with black. Anal tuft of ♂ pale buff.

Length of fore wing ♂ ♀ 12 mm.

Hab. Mt. Poi, 5200 feet—2 ♂, 1 ♀ (♂ and ♀ Types); 7350 feet—1 ♀.

26. *ASURA CRUSTATA* sp. nov.

Distinct from other forms of this genus in the possession of a band of raised scales in the cell of the fore wing.

♂. Fore wing crimson mixed with yellow, but slightly rubbed. Costa and outer margin narrowly black; a black costal mark reaching the discocellulars, a second mark proximal of this but faint. Cell rather narrow and filled by a mass of raised scales having a mother-of-pearl gloss. Lower edge of cell bent outwards, giving place for a dense tuft of

short light brown hair. Hind wing yellowish-white tinged with crimson, more so on the margin. Costal edge black, fringe black to the anal angle.

Underside paler, fore wing with the black edging extended, more so at the apex.

Antennae dark brown, shaft slightly crimson above. Palpi and legs crimson. Head, thorax, and abdomen above salmon-pink, abdomen below more crimson.

Genitalia visible: Valve long, ending in a short, narrow lobe directed dorsad. Uncus long and curved to a fine point. General appearance as in other *Asura* species.

Length of fore wing 10 mm.

Mt. Dulit, 700 feet—1 ♂.

27. ASURA CUNEIFERA Walk.

Lyclene cuneifera Walk., Journ. Linn. Soc. Zool., vi, p. 113, 1862, Sarawak.

Mt. Dulit—1 ♀.

28. ASURA EUPREPIOIDES Walk.

Hypocrita euprepioides Walk., Journ. Linn. Soc. Zool., vi, p. 102, 1862, Borneo.

Mt. Poi, 4300--5300 feet—1 ♀; Mt. Penrissen, 2000 feet—2 ♀.

29. ASURA STRIGIPENNIS H.-S.

Aussereur Schmett. f. 437, 1855, Borneo.

Mt. Penrissen, 2000 feet—1 ♀; Mt. Poi, 5000 feet—1 ♀; 4800 feet—1 ♀.

30. MILTOCHRISTA SEQUENS Walk.

Lyclene sequens Walk., Journ. Linn. Soc. Zool., vi, p. 112, 1862, Sarawak.

Bakong—1 ♂; Lio Matu, December—1 ♂.

31. MILTOCHRISTA CUNEONOTATA Walk.

Ammatho cuneonotatus Walk., Cat. Lep. B.M., iii, p. 759, 1855, Ceylon.

Mt. Poi, 900 feet—1 ♀; 2000 feet—1 ♀.

32. MILTOCHRISTA CRUCIATA Walk.

Hypoepria cruciata Walk., Journ. Linn. Soc. Zool., vi, p. 101, 1862, Sarawak.

Mt. Dulit, 3000 feet—3 ♀.

33. *MILTOCHRISTA FLAVODISCALIS* sp. nov.

Allied to *mesortha* Hmps. from India, but distinguished by the rounded yellow discal spot on the fore wing, etc.

♂. Fore wing crimson; two black dots at the base and one in base of cell: an antemedial black line outcurved from costa and oblique from lower edge of cell; a discal black line oblique from the costa and joining the antemedial line in the cell, then outcurved to the submedian fold where it ends; a post-discal black line outcurved from costa to vein 5, then oblique to the margin; a large rounded yellow spot on the discocellulars; slight yellowish scaling below the cell; veins 4-9 black between the post-discal line and the margin; costal edge and fringe black. Hind wing yellowish-white with a marginal border flesh-pink, this colour slightly washed over the wings leaving the costal and a subapical area of ground-colour.

Underside of fore wing crimson, paler at base; discocellular spot distinct; some black marks on the costa, a subapical patch and a spot in 4 near the margin. Hind wing with only slight pink tinge, a dark costal spot, a large one in cellule 5 and a smaller one above and below this.

Antennae, palpi, head, thorax and legs crimson; abdomen flesh-pink.

Length of fore wing 12.5 mm.

Mt. Murud, 6000-6500 feet, November—3 ♂.

34. *MILTOCHRISTA GRATIOSA lucibilis* Swinh.

Barsina lucibilis Swinh., Cat. Het. Mus. Oxon., p. 107, pl. 3, fig. 6, 1892, Sarawak.

Miltochrista gratiosa Hmps., Lep. Phal., ii, p. 485, 1900.

Mt. Murud, 6000-6500 feet, November—1 ♂, 1 ♀; October—1 ♂.

35. *MILTOCHRISTA RUBRICOSTATA* H.-S.

Hypocrita rubrocostata Herr.-Schaff., Auss. Schmett. 1, p. 439, 1855, Borneo.

Mt. Penrissen, 3500 feet—1 ♀.

36. *SCHISTOPHLEPS FULVIA* Hmps.

Cat. Lep. Phal., ii, p. 528, 1900, Java, Sumatra, Borneo.

Mt. Dulit—2 ♀.

37. *HEMIPSILIA COAVESTRIS* Hmps.

Moths of India, ii, p. 124, 1894, Sikkim.

Mt. Poi, 5000 feet—1 ♂.

38. *DIDUGA ANNULATA* Hmps.

Cat. Lep. Phal., ii, p. 539, 1900, Sambawa.

Mt. Murud, 6300 feet, November, 1922—1 ♂.

39. *CONOSIA ASPERSA* Walk.

Journ. Linn. Soc. Zool., vi, p. 104, 1862, Sarawak.

Mt. Dulit, November—1 ♀; Mein Plateau, November—1 ♀.

40. *EUGOA BIPUNCTATA* Walk.

Lyclene bipunctata Walk., Journ. Linn. Soc. Zool., vi, p. 115, 1862, Borneo.

Mt. Poi, 4200 feet—1 ♂; 5300 feet—1 ♀.

ARCTIANAE.

41. *SPILOSOMA RUBRIVENTRIS* sp. nov.

Distinguished from most species by the abdomen being entirely red and by the absence of dorsal spots in the ♂. Most nearly related by build and general appearance to *rhodochroa* Hmps. from Java, and like this species in the semi-hyaline discal area of hind wing.

♂. Fore wing ochreous tinged with pale flesh-pink, the veins, inner and outer margin pale buff. A black point at base and one in lower part of cell; a spot above this on the costa and a similar one at upper angle of cell; two black sub-basal spots, one in the inner margin and one above it, divided by the submedian; two similar spots at the end of the post-discal line; the line slightly darker than the ground-colour but emphasized by spots divided by the veins, curved outwards from the costa at origin of vein 7 and thence inwards from vein 5; a costal spot before vein 7 one beyond vein 7 and another below this in the angle of 7; two sub-marginal rows of spots divided by the veins, the first row from the apex to vein 5, the second row from vein 3 to vein 5 near the margin; the first row is continued again at vein 2 near the post-discal line with a small spot below the vein and one on the submedian, these spots absent in one specimen.

Hind wing crimson, lower half from middle line of cell to near the margin semi-hyaline; a black spot on the upper discocellular; fringe pale yellow.

Underside of fore wing crimson, outer margin pale yellow narrowing to the tornus; a small black spot in upper angle of cell. Hind wing as on upperside.

Antennae bipectinate, black; palpus with first and second segment crimson, third black; frons black; head and thorax whitish-buff; abdomen crimson with a double lateral row of small black spots. Pectus crimson, tibiae and tarsi crimson, femora fuscous-black.

♀. Like the ♂ except that there is no black spot in angle of cell on fore wing, and on the hind wing an additional black submarginal spot in 1c near vein 2. Abdomen with a thin black dorsal line. Underside of fore wing with the apical and submarginal spots distinct.

Length of fore wing ♂ 25 mm., ♀ 32 mm.

Mt. Murud, 6000-6500 feet, November—3 ♂, 1 ♀.

42. *SPILOSOMA STRIGATULA* Walk.

Arctia strigatula Walk., Cat. Lep. Het. B.M., iii, p. 613, 1855, Java.

Mt. Dulit, 700 feet (?)—1 ♀.

43. *CREATONOTUS TRANSIENS* f. *vacillans* Walk.

Amphissa vacillans Walk., Cat. Lep. Het. B.M., iii, p. 685, 1855, N. Indies.

Pah Trap, November—2 ♂.

LIPARIDAE.

44. *LEUCOMA SUBMARGINATA* Walk.

Cat., iv, p. 826, 1855, India.

Mt. Poi, 4300 feet—1 ♂; Mt. Murud, 6000-6500 feet, November—1 ♂.

45. *LEUCOMA DIVISA* Walk.

Cat., iv, p. 836, 1855, N. India.

Mt. Poi, 4500 feet—2 ♂; 4300 feet—1 ♂.

46. *IDALIA SERICEA* Moore.

Proc. Zool. Soc., p. 600, 1877, Andamans.

Bakong—1 ♀.

47. *NYGMIA XANTHOMELA* Walk.

Journ. Linn. Soc. Lond. Zool., vi, p. 128, 1862, Sarawak.

Mt. Murud, 6000--6500 feet, November—1 ♂.

48. *NYGMIA LYCLENE* Swinh.

Euproctis lycleene Swinh., Trans. Ent. Soc., p. 144, 1904, Kuching.

Mt. Poi, 4500 feet—1 ♂ (neallotype).

The female type from Kuching is apparently the only known specimen. We therefore describe the ♂.

♂. Fore wing without the black spot at end of cell. A yellow discal line formed of four spots, one on the costa, one in the cell near vein 2, one below this shifted in, one below this on the submedian, and another from the submedian to inner margin. Some sub-basal yellow spots, the one on the inner margin most distinct. These yellow markings are faintly seen in the type ♀ which is rubbed, but no mention is made of them in the original description.

49. *NYGMIA SEXMACULA* Swinh. ♂ ?

Ann. Mag. Nat. Hist., 7, xii, p. 195, 1903, Kinabalu, ♀.

This species is very like the ♀ *sexmacula* and may possibly be its ♂.

Fore wing with a post-discal line of spots fuscous-black, slightly indicated above vein 5, the spot in 4 the larger, the one in 2 the smaller, and the spot between vein 2 and the margin curved outwards. A sub-basal spot above the submedian. Hind wing with the basal two-third fuscous, leaving a pale orange marking.

Fore wing below with a fuscous stripe between vein 2 and the inner margin, reaching the base and subcostal and to within a third from the outer margin.

Length of fore wing 19 mm.

Pah Trap, 3000 feet, November—1 ♂.

50. *NYGMIA ORMEA* Swinh.

Trans. Ent. Soc., p. 426, 1903, S.E. Borneo.

Mt. Poi, 5200 feet—1 ♀.

51. *NYGMIA SARAWACENSIS* sp. nov.

Possibly a race of *nigribasalis* Swinh., Trans. Ent. Soc., 1903, p. 397, Kinabalu.

♀. Differs from the ♀ type of *nigribasalis* in its much larger size, the fuscous area of the hind wing more extended, and only a faint discocellular mark on the fore wing.

Fore wing grey-white. Hind wing with the basal two-thirds fuscous.

Underside of fore wing with the basal two-thirds fuscous, distally nebulous. Hind wing with the basal half to a little beyond cell fuscous. Antennae with the shaft grey, branches fuscous. Palpi fuscous; head and thorax rufous; abdomen fuscous; legs pale fuscous.

Length of fore wing 26--28 mm.

Mt. Murud, 6000--6500 feet, October—2 ♂, 1 ♀ (Type).

52. *NYGMIA CALESIA* Swinh. *nigrifascia* subsp. nov.

Differs from *calesia* in the fore wing having a black discal band of variable width, and a black sub-basal spot on inner margin which just enters the cell. The post-discal band is contracted in cellule 2 and does not reach the costa. Hind wing with the yellow marginal border reduced to a thin line which does not reach the anal angle.

Mt. Poi, 5000 feet—1 ♂ (Type); Mt. Penrissen, 3500 feet—1 ♂; 2000 feet—1 ♀ (allotype).

This species is diurnal.

53. *NYGMIA CINCTA* Swinh.

Ann. Nat. Hist., 7, xvii, p. 541, 1906, Borneo.

Pah Trap, 3000 feet, November—1 ♂.

54. *NYGMIA FUNERALIS* Swinh.

Trans. Ent. Soc., p. 421, 1903, Singapore.

Mt. Poi, 4500 feet—1 ♂.

55. *ORGYIA COSTIPLAGA* Walk.

Journ. Linn. Soc. Lond. Zool., vi, p. 126, 1862, Sarawak.

Mt. Poi, 4500 feet—1 ♂.

56. *DASYCHIRA MENDOSA* Hbn.

Zutr. Exot. Schmett., ii, p. 19, figs. 293, 294, 1823, Ceylon.

Mt. Poi, 4400 feet—1 ♂.

NOTODONTIDAE.

57. STAUIOPUS PULVERULENTUS sp. nov.

Distinct from other forms known to me.

♀. Fore wing with grey-white ground-colour thickly irrorated by black scales. A dark basal area defined by two waved sub-basal lines. A black discal line of dots on the veins, the upper part excurved beyond the discocellulars and forming a black line to vein 3, a faint curved mark joining the dots on 3 and 2, a dot below 2 on the submedian fold, one on the submedian more distal, and one on the margin a little proximal of the preceding. A post-discal line of dots on the veins, the upper row at right angles to the costa to vein 3, thence parallel to the outer margin and converging to the discal line. An irregular submarginal line emphasised by a faint grey-white outer edge. Fringe grey-white with black dots at the veins. The discal area between the sub-basal and post-discal lines paler in colour than the rest. Hind wing grey-white, the veins and a marginal border pale fuscous. Marginal band from base of costa to anal angle broad at the apex and reaching behind the fork of veins 6 and 7, and becoming linear below vein 3. Inner margin slightly fuscous. Fringe grey-white interrupted at the veins by the fuscous margin.

Underside of fore wing fuscous-brown more chestnut-coloured on the costa. Costal edge grey-white, spotted near the apex. Area 1a grey-white.

Hind wing as on upperside, costa fringed with grey-white hair.

Palpi grey-white, first and second segments dark brown on the outside. Antennae dark brown with slight grey-white scaling. Head and thorax grey-white irrorated with chestnut-brown. Abdomen fuscous-brown above, with thin dorsal line, grey-white below. Pectus grey-white. Legs grey-white banded with black.

Length of fore wing 28 mm.

Mt. Murud, 6000-6500 feet, October—1 ♀.

58. SPHINGOGNATHA PALLIDA Walk.

Cat. iv, p. 912, 1855, Silhet.

Mt. Murud, 6000-6500 feet, October—1 ♂; November—1 ♀.

This species is variable and extends to Sumatra.

The ♀ is dark ochreous-brown with well-defined lines and a rounded hyaline discal spot on fore wing.

59. TAGORA GLAUDESCENS Winkl. *obsoleta* subsp. nov.

♂. Distinguished from the typical form by the absence of the marginal line on the hind wing above, and by the underside having only a trace of the post-discal lines without other markings. The glaucous scaling in the distal areas of both wings is more hoary than bluish.

Mt. Murud, 6000--6500 feet, October—1 ♂; November—2 ♂.

DREPANIDAE.

60. ALBARA OLIVACEA Warr.

Seitz. Macrolep., x, p. 469, t. 494, 1922, Khasia Hills.

Mt. Murud, 6500 feet, November—1 ♂.

61. STREPSIGONIA PUSTULARIA Walk.

Cat. xxiii, p. 938, 1861, Sarawak.

Mt. Murud, 6000--6500 feet, November—1 ♂.

62. DRAPETODES NUMMULARIA Snell.

Tijdschr. Ent., xxxii, p. 11, pl. 1, figs. 4, 4a, 1889, Java.

Mt. Poi, 2000 feet—1 ♀.

63. DRAPETODES MATULATA Feld.

Reise Nov. Lep., v, t. 134, fig. 44, 1876, Java.

Mt. Penrissen, 3500 feet—1 ♂.

LIMACODIDAE.

64. CONTHEYLA CHARA Swinh.

Ann. Mag. Nat. Hist., 7, (vii), p. 464, 1901, Sarawak.

Mt. Murud, 6000--6500 feet, November—1 ♂.

65. CANIA BANDURA Moore.

Cat. Lep. Mus. E.I. House, ii, p. 417, t. 11a, fig. 9, 1859, Java.

Bakong—1 ♂.

66. THOSEA UNIFASCIA Walk.

Cat. v, p. 1068, 1855, E. Indies.

Mt. Penrissen, 4400 feet—1 ♂; Mt. Murud, 6000--6500 feet—1 ♂; November—1 ♂.

67. THOSEA VETUSTA Walk.

Journ. Linn. Soc. Lond. Zool., vi, p. 198, 1862, Sarawak.

Pah Trap, November—1 ♂.

68. DARNA METALEUCA Walk.

Journ. Linn. Soc. Lond. Zool., vi, p. 126, 1862, Sarawak. = *basalis*
Walk., 1. c., p. 172.

Mt. Dulit—1 ♂.

URANIIDAE.

69. NYCTALEMON HECTOR Walk.

Cat. vii, p. 1771, 1856, Borneo.

Baram, February—1 ♂.

70. URAPTEROIDES ASTHENIATA Guen.

Sp. Gen. Lep., x, p. 24, No. 925, 1857, Borneo.

Bakong—1 ♂.

71. MICRONIA STRIATARIA Clerck.

Icones ii, pl. 1v, 1764.

Mt. Penrissen, 3500 feet—1 ♀.

72. STROPHIDIA FASCIATA Cram.

Pap. Ex., ii, p. 12, pl. civ, fig. D., 1777, Batavia.

Mt. Poi, 2000 feet—1 ♀.

EPIPLEMIDAE.

73. EPIPLEMA LABECULA Swinh.

Trans. Ent. Soc., 1902, p. 595, Pulo Laut.

Mt. Poi, 5000 feet—1 ♂; 4300 feet—1 ♂; 2000 feet—1 ♀.

74. EPIPLEMA NIGRIFRONS Hmps.

Moths of India, iv, p. 549, 1896, Burma.

Mt. Penrissen, 2400 feet—1 ♀.

ZYGAENIDAE.

75. ETERUSIA DICHROA Jord.

Seitz. Macrolep x, p. 33, 1908, Assam.

Between Roemah Tamaboperak--Lio Matu, December—1 ♂.

76. CYCLOSIA MACULARIA Guér.

Deless. Suov. Ind., p. 83, t. 25, fig. 2, 1843, Borneo.

Bakong—1 ♂.

77. *CYCLOSLIA ELECTRA* Swinh. ♀.

Ann. Mag. Nat. Hist., 7, (15), p. 149, 1905, Penrisen & Santubong, Borneo.

♀. Fore wing black. A creamy-white stripe on the inner margin, the submedian not black. A sub-apical band of lemon yellow, whitish on the inner edge, constricted at vein 5, and extending from the costa to vein 2. Hind wing creamy-white with a black marginal border from the apex to vein 2.

Underside similar to the upper. Fore wing with a narrow white stripe from the base of cellule 1c to vein 2 at its middle and merged with the large stripe along the submedian; above this stripe to the costa, the basal area is greenish-blue. Greenish-blue submarginal streak in cellules 5--7 and small spots in 10--4. Hind wing with greenish-blue spots in 2--6 within the marginal black. Fringes black, slightly white at apex of both wings. Legs white striped above with greenish-blue.

Length of fore wing 26 mm.

Mt. Penrisen, 4400 feet—1 ♀.

Dr. Jordan kindly informs me, when seeing this insect, that there is a ♂ and ♀ in the Tring Museum. It appears that the ♂ is variable and as the ♀ described is from the type locality it is unlikely to be different.

COSSIDAE.

78. *CHALCIDICA MINEUS* Crm.

Pap. Exot., ii, p. 52, t. 131, fig. D., 1777, E. Indies.

Baram, February—1 ♂.

Explanation of Plate 6.

HETEROCERA.

- Fig. 1. *Nygmia sexmacula*, Swinh. ♂ Neallotype.
 ,, 5. *Callitomis mjobergi*, Talb. ♂ Type.
 ,, 6. *Chionaema rhadota borneensis*, Talb. ♀ Type.
 ,, 7. *Chionaema cruentata*, Talb. ♀ Allotype.
 ,, 11. *Miltochrista flavodiscalis*, Talb. ♂ Type.
 ,, 13. *Monosyntaxis trimaculata*, Hmps. ♂ Neallotype.
 ,, 17. *Nygmia calesia nigrifascia*, Talb. ♂ Type.
 ,, 18. *Ilema curciplaga ruptifascia*, Talb. ♀ Type.
 ,, 19. *Scaptosyle tricolor dentata*, Talb. ♂ Type.
 ,, 23. *Stauropus pulverulentus*, Talb. ♀ Type.
 ,, 25. *Agylla mjobergi*, Talb. ♂ Type.



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7



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17



18



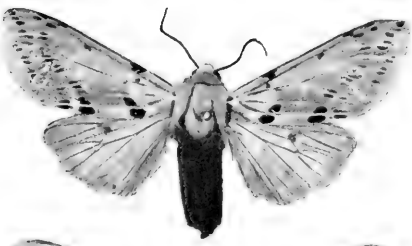
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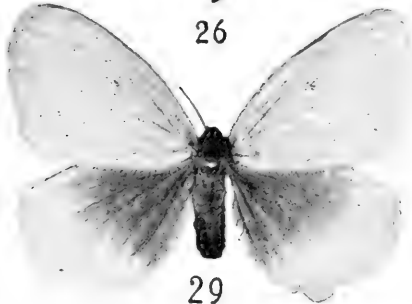
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XI.—Microlepidoptera from Northern Sarawak. By E. MEYRICK, M.A., F.R.S.

TORTRICIDAE.

CAPUA AELUROPA n. sp.

♀ 16 mm. Head pale ochreous. Palpi pale ochreous, externally suffused, fuscous. Thorax fuscous, towards middle of anterior margin pale ochreous. Fore wings suboblong, costa moderately arched, termen hardly rounded, rather oblique; light brownish-ochreous, irregularly mixed fuscous; markings fuscous, marked or edged with transverse strigae of mixed ferruginous and black scales; basal patch rather small, edge angulated in middle; central fascia moderate, oblique, much dilated on dorsal half, where it extends to tornus; costal patch large, elongate-triangular; a subtriangular blotch along termen, between this and costal patch some white irroration in disc; cilia pale ochreous, obscurely spotted grey and tinged ferruginous. Hind wings grey; cilia pale grey.

Mt. Murud, 7200 feet, November, one specimen. Allied to *vulgaris* from Java.

ADOXOPHYES CHLOROMYDRA n. sp.

♀ 17 mm. Head and palpi light orange ochreous. Thorax whitish ochreous. Fore wings suboblong, costa gently arched, termen rather obliquely rounded; ferruginous-brown, on costa becoming ferruginous orange; pale yellowish transverse blotches from costa about 1/4 and beyond middle reaching half across wing, and a smaller subquadrate blotch on dorsum between and tending to coalesce with these; some narrow pale yellowish suffusion along termen: cilia pale yellowish. Hind wings light grey; apical edge suffused whitish-yellowish; cilia whitish-yellowish.

Mt. Dulit, 3000 feet, one specimen. Not near any other species.

CACOEZIA CIRRHOCROSSA n. sp.

♂ 22 mm. Head, palpi, and thorax dark violet-brown. Fore wings oblong, costa strongly arched anteriorly, with narrow fold from base to $1/4$, posteriorly somewhat sinuate, apex (with cilia) appearing slightly prominent, termen hardly sinuate, vertical; brown, with violet gloss; basal patch suffused dark violet-fuscous towards costa and dorsum, edge indicated only by a few dark brown scales; central fascia rather narrow, oblique, dark violet-fuscous, almost obsolete between dorsal half and a costal spot, extended on dorsum to near tornus; some scattered dark fuscous strigulae towards apex; costal represented by a slender suffused dark brown costal streak, followed by two dark brown marks before apex; cilia whitish-ochreous, basal third brownish, violet-grey spots at apex and tornus. Hind wings rather dark grey; cilia grey, an expansible pencil of white hairs in dorsal cilia at base.

Mt. Poi, 5200 feet, one specimen.

TORTRIX FELINA n. sp.

♀ 16-17 mm. Head and palpi pale ochreous, partially suffused fuscous. Thorax ochreous-fuscous. Fore wings suboblong, costa anteriorly moderately arched, termen somewhat sinuate, hardly oblique, violet-grey; costa with ochreous-fuscous dots and marks surrounded with white suffusion; six irregular ochreous-fuscous striae from dorsum, edged with white suffusion, first short from near base, second at $1/4$ reaching $3/4$ across wing, third short, fourth irregular from middle of dorsum to near costa at $2/5$, fifth short, sixth from before tornus to a transverse mark on end of cell; a slightly curved ochreous-fuscous stria edged anteriorly by a white stria from costa at $3/5$ to tornus; a short ochreous-fuscous stria edged with white suffusion towards termen beneath apex; cilia pale ochreous, with a slender dark grey median line. Hind wings grey; cilia pale ochreous tinged grey.

♂ 15 mm. Fore wings as in ♀, but with costal edge slightly reflexed from base to $2/5$ and narrow appressed fold of scales from $1/6$ to $1/3$; wing suffused whitish-ochreous except dark apical beyond a line from $3/5$ of costa to tornus, with an undefined fascia of violet-fuscous irroration or suffusion from costa about $1/3$ to basal fourth of dorsum; cilia mostly suffused whitish-ochreous. Hind wings pale grey; cilia whitish-ochreous.

Mt. Dulit, Mt. Murud, Mt. Poi, 3000-5000 feet, four specimens.

HARMOLOGA OMOPHAEA n. sp.

♂ 25--26 mm. Head whitish-brownish. Palpi whitish, irrorated fuscous. terminal joint fuscous. Antennal ciliations 3/4. Thorax fuscous tinged whitish posteriorly. Fore wings suboblong, costa anteriorly strongly arched, slightly rolled up on basal third, posteriorly nearly straight, termen faintly sinuate beneath apex, then rounded, somewhat oblique; grey-whitish, slightly sprinkled grey with some ferruginous scales; markings brown irregularly mixed blackish; basal patch rather small, edge oblique, irregular; central fascia moderate, irregular-edged, oblique; a blotch on costa at 2/3; from beneath costa at 3/4 an interrupted stria runs to tornus; two or three short strigae beyond this; cilia whitish, round apex and upper part of termen a fuscous subbasal line. Hind wings pale grey; cilia grey-whitish.

Mt. Murud, 6300--7200 feet, two specimens. Allied to *miserana*.

SCHOENOTENES SYNCHORDA Meyr.

Mt. Murud, one specimen.

FLAEODINA n. g.

Palpi moderate, porrected, second joint expanded with rough scales towards apex above and beneath, terminal joint moderate, cylindrical. Thorax with slight posterior double crest. Fore wings with tufts of scales; 3--5 approximated at base, 7 and 8 stalked, 7 to termen. Hind wings without cubital pecten; 3 and 4 connate, 5 closely approximated at base, 6 and 7 closely approximated towards base.

Intermediate between *Argyrotoxa* and *Spatalistis*.

FLAEODINA REFRANGENS n. sp.

♀ 18 mm. Head and thorax ferruginous irregularly streaked ochreous-whitish. Palpi whitish-ochreous, three black dots on second joint, and one near apex of terminal. Fore wings suboblong, termen sinuate, vertical; ferruginous, irregularly marbled with sinuous dull brownish-violet streaks edged whitish; a series of five small black ridge-tufts from costa at 2/5 to dorsum at 3/5; four whitish dots on posterior half of costa, from first two of these short very oblique series of 2 or 3 small groups of black scales; a silvery streak along

termen: cilia ochreous-whitish, a fine interrupted subbasal ferruginous line, at apex a grey spot, some slight violet-grey suffusion on tornus. Hind wings dark grey; cilia grey, paler towards tips.

Mt. Murud, 6300 feet, one specimen.

EUCOSMIDAE.

ACROCLITA TRACHYNOTA n. sp.

♂ ♀ 17--18 mm. Head and thorax pale dull greenish, face whitish. Palpi whitish, second joint suffused pale greenish, sometimes slightly marked grey. Fore wings elongate-oblong, costa in ♂ roughened with scales from near base to middle, with moderate fold on basal third, termen very faintly sinuate, somewhat oblique, dorsum in ♂ with strong rough projecting fringe of dense scales from base to $3/5$, light dull green; costa with pairs of oblique white strigulae, separated by small blackish spots; basal patch in ♀ represented by some small blackish markings towards base, a large spot on costa at $1/5$, and an outlined rather oblique fasciate streak from dorsum at $1/4$, in ♂ these merged in a triangular blackish blotch occupying basal fourth of costa and extended as a thick streak in disc to central fascia, and an irregular patch of dark grey suffusion, mixed blackish, occupying dorsal area and fringe from base to beyond middle; upper half of central fascia forming an oblique blackish blotch, with a strong angular projection from middle of posterior margin; four short suboblique yellowish marks beneath costa posteriorly; an irregular transverse patch of very fine short black longitudinal strigulation before termen on lower $2/3$, almost connected with a similar spot on dorsum before tornus; some silvery whitish iridescence along terminal edge: cilia ochreous-yellow, on upper part of termen very obscurely barred greyish. Hind wings dark grey; in ♂ costa prominent beyond middle, with a long expansible pale greyish hair pencil from base lying beneath costa, and a spot of thickened scales at tornus; cilia grey.

Mt. Murud, 6300--6500 feet, two specimens.

ACROCLITA EUPHYLLA n. sp.

♂ ♀ 19--22 mm. Head and thorax green. Palpi green, second joint with blackish bar, terminal joint white except base. Fore wings somewhat dilated, costa gently arched, termen sinuate, somewhat oblique; green or greenish-yellow;

markings blackish, edged with silvery-white reflections; a dot on base of costa and irregular transverse mark following it; an irregular curved oblique streak from base of dorsum to above fold; a transverse spot from costa at $1/4$ followed by a dot or mark in disc; a sometimes incomplete spot or streak from dorsum at $1/3$ and a dot above fold beyond it; a dot on costa at $2/5$; an irregular rather oblique curved, sometimes interrupted, streak from middle of costa; an oblique slightly curved streak or spot beneath middle of disc; three small spots on costa posteriorly; an irregularly angular, sometimes interrupted, streak from costa just before apex to before middle of termen; a rather oblique streak from dorsum towards tornus; a dash on termen below middle: cilia greenish or greenish-yellow. Hind wings grey; cilia pale greenish, becoming pale grey round tornal area and dorsum.

Mt. Murud, 6300 feet, two specimens. The markings are evidently variable in detail; the species is nearly allied to *prasinissa* from Java, but easily distinguishable by the presence of the oblique streak below middle of disc, and the greenish cilia of hind wings.

ACROCLITA ALTIVAGA n. sp.

♂ 19 mm. Head grey-whitish. Palpi dark grey, tip white. Thorax whitish-grey. Fore wings elongate, slightly dilated, costa gently arched, termen slightly sinuate, somewhat oblique: dark grey, costa dark fuscous with pairs of white strigulae, dorsum dotted white; an irregular blotch of white suffusion in middle of disc, a smaller blotch near beyond it towards costa, and two transverse irregular edged approximated blotches forming ocellus, second connected with praeapical strigulae: cilia whitish, at apex a dark fuscous spot.

Hind wings grey; a broad lobate expansion of costa from base to beyond middle clothed above with a brush of long light grey hairs; cilia whitish, of a light grey subbasal shade.

Mt. Murud, 7200 feet, one example.

EUCOSMA CENTRASPIS n. sp.

♀ 16 mm. Head, palpi, and thorax dark grey. Fore wings with termen sinuate-indentured in middle, rather oblique; dark grey, suffusedly irrorated white: costa with paired rather oblique white strigulae throughout separated by blackish marks or small spots; edge of basal patch formed by an irregular blackish stria, obtusely angulated in middle; an elongate suffused blackish spot in disc beyond this; central fascia

represented by a short oblique black streak from middle of costa. a blackish-grey dorsal blotch (lighter centrally), before ocellus, and a slightly up-curved longitudinal blackish streak above this; ocellus with very narrow internal space enclosed by two thick erect leaden-metallic streaks touching beneath, posterior cut by a fine black dash near lower end, above it an elongate blackish spot confluent with a small round blackish apical spot; cilia grey slightly sprinkled white. Hind wings with 3 and 4 coincident; rather dark grey; cilia grey, a darker basal shade.

Mt. Poi, 5300 feet, one specimen.

PROSCHISTIS PRAECEPTA Meyr.

Mt. Murud, 6000 feet, one specimen.

ARGYROPLOCE MORMOPA Meyr.

Mt. Murud, 6000 feet, one specimen.

GELECHIADAE.

TELPHUSA EXPOSITA n. sp.

♀ 15 mm. Head and thorax white, slightly speckled fuscous. Palpi white, second joint with slender blackish subbasal and subapical rings, terminal joint with slender subbasal ring and apical half except tip blackish. Fore wings elongate, apex pointed termen extremely obliquely; white, with scattered fuscous scales; markings blackish; a short mark from base of costa, and a small spot on costa near base; a dot in disc at $1/5$; a rather oblique streak from costa at $1/4$, somewhat dilated towards fold, and with a small tuft on anterior edge on fold, not reaching dorsum; a small spot on costa before middle; a dot in disc beneath this, and one at $2/3$ (discal stigmata); a spot on costa at $3/5$; a raised transverse mark above dorsum before tornus; small spots on costa at $3/4$ and at apex; some irregular clouding of dark fuscous irroration towards termen; cilia whitish, a few dark grey streaks. Hind wings subhyaline very pale bluish-grey, darker towards apex; cilia grey-whitish.

Mt. Murud, 6500--7200 feet, two specimens.

EPIMIMASTIS EMBLEMATICA Meyr.

Mt. Murud, 6500 feet, one specimen.

ANARSIA STHENAROTA n. sp.

♀ 13 mm. Head and thorax grey suffusedly irrorated white. Palpi white, second joint sprinkled grey, basal $2/3$ blackish, terminal joint with subbasal ring and nearly confluent bands above and below middle blackish. Fore wings elongate, costa slightly sinuate, apex obtuse, termen very obliquely rounded; 7 and 8 out of 6; grey, suffusedly irrorated white and somewhat sprinkled dark fuscous; two short black marks along costa before and beyond $1/4$, a semi-oval black spot on middle of costa, and four small dark grey transverse marks posteriorly; a black dash in disc before middle, enclosed in a spot of dark grey suffusion; a round blackish dot enclosed in a small spot of brown-grey suffusion towards dorsum at $1/4$; several cloudy blackish-grey dots along termen; cilia grey, speckled whitish. Hind wings pale grey, subhyaline, darker posteriorly; cilia whitish-grey.

Mt. Murud, 6500 feet, one specimen. If a true *Anarsia* (in absence of ♂ not absolutely certain, but probably correct), it is the only species known to me with veins 7 and 8 of fore wings out of 6; in *Chelaria* these two types of neuration (rarely found together in the same genus) are equally common, but never occur in the same species.

CHELARIA AGRIOGRAMMA n. sp.

♀ 18 mm. Head and thorax whitish-ochreous slightly sprinkled brownish, patagia mixed dark fuscous. Palpi whitish, second joint on basal half banded with dark fuscous irroration, with long rough projecting ochreous hairs sprinkled dark fuscous from near base to near apex. Fore wings rather narrow, apex obtuse-pointed, termen very obliquely rounded; 6 separate, closely approximated; whitish-ochreous, scattered brownish scales; three irregular black lines suffused brown, namely, one subcostal from base to near middle, one along fold throughout and one from disc before $1/3$ to just below apex, with a branch along vein 9; a suffused dark fuscous streak along costa from $1/4$ to $3/5$, cut by oblique whitish strigulae at $1/3$ and beyond middle; some irregular brownish suffusion towards dorsum and termen; two oblique whitish strigulae from costa posteriorly, edged brown and separated by a brown stria running to apex with blackish dot towards apex and black linear apical dot: cilia pale greyish-ochreous, on costa brownish-whitish with a brown shade. Hind wings grey; cilia grey-whitish.

Mt. Murud, 4500 feet, one specimen. Nearest *tortuosa* from Ceylon.

XENORRHITHMA n. g.

Head with appressed scales, side tufts raised, in ♂ projecting; ocelli posterior; tongue developed. Antennae 4/5, in ♂ evenly ciliated, basal joint elongate, without pecten. Labial palpi very long, recurved, second joint thickened with dense scales, roughly projecting above towards apex, in ♂ also with very long fine expansible hairs from base, terminal joint about as long as second, slender, acute. Maxillary palpi rudimentary. Fore wings with 2 and 3 stalked from near angle, 7 and 8 stalked, 7 to apex, 9 approximated, 11 from beyond middle. Hind wings over 1, trapezoidal, termen slightly sinuate, cilia 1/2; in ♂ 2 and 3 stalked, 4 from angle, 5 parallel, 6 to 7 closely approximated at base, in ♀ 2 remote, 3 and 4 connate from angle.

Type *traumatias* Meyr., referred to *Myrophila*, of which the other species are South American; the discovery of the singular neuration of ♂ (the species being previously known from the ♀ only), renders a new genus requisite.

XENORRHITHMA TRAUMATIAS Meyr.

Mt. Poi, 4500 feet, one specimen.

TISIS BICOLORELLA Walk.

Mt. Dulit, 300 feet, one specimen.

TISIS CERAMBYCINA n. sp.

♂ 18 mm. Head dark fuscous with bright metallic-blue reflections. Palpi whitish-grey ochreous, terminal joint dark fuscous anteriorly. Antennae dark grey, thickened with an oval swelling of metallic-grey scales at base of stalk. Thorax dark fuscous, patagia suffused indigo blue. Fore wings rather narrow, termen very obliquely rounded; rather dark fuscous, overlaid dull green on basal half, becoming bluish at base; cilia fuscous. Hind wings and cilia fuscous; dorsal 2/3 from base to middle roughened with loosely erected long hair scales.

Mt. Poi, one specimen. Nearly allied and very similar to *bicolorella*, but that species has an ochreous head, white antennal stalk, and ochreous hind wings with raised hair scales differently disposed.

TISIS POLEMARCHA n. sp.

♂ 26 mm. Head dark grey. Palpi ochreous-whitish, second joint very long, with dark grey terminal tuft of dense scales, terminal joint aborted, concealed in scales of second. Antennae pale grey, apical third white, tip dark grey, a densely scaled dark grey thickening at base of stalk. Thorax dark grey, posterior third light orange. Fore wings elongate, costa strongly arched, termen very obliquely rounded; 9 out of 7; light orange; thick costal and dorsal and slender median dark grey streaks from base to $1/5$, costal marked with blue-leaden-metallic, sending a curved undefined fascia of dark grey suffusion mixed with blue-leaden-metallic scales to near dorsum before middle; a broad dark grey streak narrowed posteriorly along costa from $2/5$ to apex, almost confluent with preceding, leaving costal edge yellow; a dark grey wedge-shaped blotch extending from disc at $3/4$ to lower part of termen, apex anterior; cilia light yellowish, on upper part of termen suffused fuscous. Hind wings with cell $1/3$ of length of wing, 4 and 5 out of 3, 6 absent, 8 running into a glandular swelling on costa at $1/3$; dark grey; discal area from near base to near termen, and costal area suffused ochreous-whitish, a series of long erect ochreous-whitish hairs along submedian fold; a short tuft of ochreous-whitish hairs on costal gland at $1/3$; cilia ochreous-whitish becoming grey towards dorsum.

Mt. Murud, 6500 feet, one specimen.

TISIS POLYCHLORA n. sp.

♂ 23 mm. Head and thorax light ochreous-bronzy, collar pale ochreous. Palpi pale ochreous, terminal joint slender, acute, anterior edge dark grey. Antennae grey, with tuft of dark metallic-grey scales at base of stalk. Fore wings elongate, costa moderately arched, termen very obliquely rounded; 9 separated; rather dark grey, markings pale ochreous; basal area to $1/3$ of costa and $2/3$ of dorsum suffused with pale ochreous irroration except towards base of costa; a very oblique suffused fascia from $2/5$ of costa to end of cell, whence a suffused costal streak runs to near apex, and suffused lines along all veins posteriorly; cilia pale ochreous. Hind wings with 3 and 4 connate, 5 closely approximated at base, 6 to costa; pale yellow-ochreous, with modified hairs scales in disc and towards costa; a suffused grey streak from base along dorsum and termen to $2/3$ of wings; cilia pale ochreous, round dorsum pale grey.

Mt. Murud, 6300 feet, one specimen.

FRISILIA MELANARDIS Meyr.

Mt. Murud, 4300 feet, one specimen.

PHILOPTILA EFFRENATA Meyr.

Mt. Murud, 6300 feet, one specimen.

THUBANA NODOSA Mevr.

Mt. Dulit, 3000 feet.

THUBANA BISIGNATELLA Walk.

Mt. Murud, 4500 feet. Mt. Poi, 4350 feet, three specimens.

HOMALOXESTIS ORTHOCHLORA n. sp.

♂ 19 mm. Head fuscous, face, palpi, and antennae whitish. Thorax rather dark fuscous. Posterior tibiae ochreous-whitish. Fore wings with apex obtuse-pointed, termen slightly sinuate, oblique; 8 and 9 out of 7, 7 to termen rather dark fuscous; a slender whitish-ochreous costal streak from base to apex, but with extreme costal edge fuscous anteriorly; cilia fuscous, on costa whitish-ochreous, on termen whitish on outer half from apex to below middle of termen. Hind wings with 3 and 4 short stalked; dark grey; cilia grey.

Mt. Poi, 5300 feet, one specimen.

LECITHOCERA THECONOMA n. sp.

♂ ♀ 17--19 mm. Head and thorax purplish-fuscous, a pale ochreous line above eyes. Palpi pale ochreous, second joint externally suffused fuscous, anteriorly edge of terminal joint dark fuscous. Antennae whitish-ochreous, towards base more or less infuscated. Fore wings elongate, somewhat dilated posteriorly, costa faintly sinuate, termen slightly sinuate, oblique; 2 and 3 stalked, 8 and 9 out of 7, 7 to hardly below apex; rather dark fuscous; discal stigmata cloudy, dark fuscous first small, second forming a rather large transverse spot; cilia greyish, base pale ochreous. Hind wings with 3 and 4 long-stalked grey; cilia whitish-grey.

Mt. Murud, 4500 feet; Lio Matu; three specimens.

LECITHOCERA FLAVIFUSA n. sp.

♂ 18 mm. Head light brownish-ochreous. Palpi whitish-ochreous, second joint dark fuscous except towards apex, terminal joint dark fuscous anteriorly. Antennae pale ochreous. Thorax light brownish. Fore wings with apex

obtuse-pointed, termen sinuate, rather oblique; 8 and 9 out of 7, 7 to termen: brownish, scattered dark brown scales, veins suffused darker brown; costal edge dark fuscous towards base; discal stigmata cloudy, blackish, second larger; eight semi-oval blackish marks on termen and apical part of costa between veins; cilia yellow-ochreous, deeper on costa. Hind wings with 3 and 4 short stalked; cilia grey.

Mt. Poi, 4350 feet, one specimen.

LECITHOCERA DUBITANS n. sp.

♂ ♀ 22 mm. Head palpi, antennae, thorax pale ochreous. Fore wings elongate, slightly dilated posteriorly, apex obtuse, termen hardly rounded, oblique; 2 and 3 connate, 7 and 8 stalked, 7 to apex; pale ochreous, some scattered fuscous specks, in ♀ some fuscous suffused irroration towards costa posteriorly; discal stigmata small, blackish, second transversely double; in ♀ a suffused fuscous subtriangular spot on dorsum towards tornus touching second discal; cilia pale ochreous. Hind wings with 3 and 4 stalked: in ♂ pale ochreous, in ♀ pale grey suffused ochreous-whitish towards costa and posteriorly; cilia in ♂ pale ochreous, in ♀ ochreous-whitish.

Mt. Murud, 6300 feet, two specimens. Nearest *subservitella*, which, however, has different neuration.

LECITHOCERA SUBSERVITELLA Walk.

♂ 17 mm. Fore wings with 2 and 3 stalked, 8 and 9 out of 7, 7 to just below apex. Hind wings with 3 and 4 coincident.

Mt. Murud, 4500 feet, one specimen.

LECITHOCERA INEPTA n. sp.

♀ 20 mm. Head palpi, antennae whitish-ochreous. Thorax light fuscous. Fore wings elongate, termen straight, rather oblique 2 and 3 stalked, 7 and 8 stalked, 7 to termen, 9 almost connate; brownish-fuscous; terminal edge slightly suffused dark fuscous; cilia light greyish. Hind wings with 3 and 4 stalked; light grey, cilia grey-whitish.

Mt. Murud, 4500 feet, one specimen. Perhaps nearest *praeses*.

LECITHOCERA ADELELLA Walk. (?)

Mt. Poi, 5300 feet, one damaged specimen.

LECITHOCERA XANTHOPHAEA n. sp.

♂ ♀ 18 mm. Head light violet-fuscous, sides of crown ochreous-yellow. Palpi in ♂ with second joint rather short, terminal joint twice second, stout, compressed and thickened with appressed scales, pointed, pale ochreous; infuscated towards base; in ♀ normal, whitish-ochreous, second joint fuscous except tip, anterior edge of terminal joint dark fuscous. Antennae ochreous-yellowish, bases of joints marked dark fuscous above. Thorax fuscous, with more or less developed yellow-ochreous stripe on each side near margin.

Fore wings elongate, apex obtuse, termen rounded, rather oblique; 7 and 8 stalked, 7 to apex, 9 almost connate; brownish irregularly sprinkled dark fuscous; a rather broad streak of yellow-ochreous suffusion from base beneath costa to costa near apex, costal edge above it suffused dark fuscous, more strongly towards base: in ♂ a rather broad yellow-ochreous subdorsal streak from near base to near termen; first discal stigma moderate, dark fuscous, second forming a narrow transverse dark fuscous bar extended to costa and dorsum by undefined dark fuscous suffusion; a dark fuscous terminal line preceded by fuscous suffusion; cilia yellow-ochreous, on termen outer half whitish-ochreous with a fuscous shade before tips. Hind wings with 3 and 4 stalked; in ♂ grey, in ♀ dark grey; cilia grey.

Mt. Poi, 4500-5300 feet, Mt. Murud, 6500 feet, six specimens. Nearly allied to *hemichrysa*, in which the palpi of ♂ are similarly abnormal, but the terminal joint is flattened and spoon shaped apically.

LECITHOCERA GRAMMOPHANES n. sp.

♀ 17 mm. Head glossy grey with bright blue reflections, a yellowish line above eyes. Palpi pale ochreous, terminal joint dark grey anteriorly. Antennae ochreous-yellowish ringed dark grey. Thorax bluish-grey. Fore wings with apex obtuse, termen hardly sinuate, rather oblique; 7 absent, 8 and 9 stalked; dark fuscous; costal, median, and subdorsal blue-leaden-metallic streaks from base to 1/4, spaces between these suffused orange; beyond these a narrow straight fascia of ground colour, edged posteriorly by a slender orange line followed by a blue-leaden-metallic median band dilated dorsally; second discal stigma forming a transverse pear shaped blackish spot margined orange; an orange costal streak from middle to 5/6, anteriorly with a small dark fuscous spot followed by

three approximated dots, beneath this a blue-leadен-metallic streak from discal spot to its extremity; blue-leadен-metallic spots occupying apex and tornus, almost meeting on termen; ground colour on posterior 2/3 of wing suffusedly mixed orange linear scales; terminal edge blackish: cilia orange, outer half greyish. Hind wings with 3 and 4 short stalked; rather dark grey; cilia grey.

Mt. Poi, 4350 feet, one specimen. Allied to *cassiterota*.

LECITHOCERA AMPHIGRAPTA n. sp.

♀ 14 mm. Head whitish-fuscous. Palpi whitish, basal 2/3 of second joint fuscous, anterior edge of terminal joint fuscous. Antennae ochreous-whitish. Thorax pale fuscous. Fore wings elongate, termen sinuate, rather oblique; 2 and 3 stalked, 8 and 9 out of 7. 7 to apex; light ashy-fuscous; markings blackish edged ochreous-yellow; a short longitudinal mark towards costa near base; an oblong spot on costa before middle; a large irregular-trapezoidal blotch in disc before middle, its base resting on fold; a transverse-oval blotch in disc beyond middle; a blackish fascia near and parallel to termen, margined only by two yellowish dots on lower half of posterior edge and a mark on dorsal edge; costal edge ochreous-yellow from antemedian spot to fascia; apical edge blackish; cilia round apex yellowish with a blackish base (elsewhere injured). Hind wings grey, cilia pale greyish.

Mt. Murud, 6500 feet, one specimen; rather imperfect, but very distinct.

COPHOMANTIS ELAPHOPIS Meyr.

Mt. Murud, 6300 feet, one specimen.

COSMOPTERYGIDAE.

STAGMATOPHORA DROSOPHANES Meyr.

Mt. Murud, 4500 feet, one specimen.

OECOPHORIDAE.

CRYPTOLECHIA SPERANS n. sp.

♀ 17 mm. Head and thorax purplish-grey. Palpi dark purplish-grey, terminal joint whitish except anterior edge. Fore wings moderate, costa gently arched, termen sinuate,

somewhat oblique; purplish-grey irrorated dark fuscous; stigmata indistinct, dark fuscous, accompanied by one or two whitish scales, apical slightly beyond first discal; a small ochreous-whitish flattened-triangular spot on costa about $3/4$, cilia rather dark fuscous, base pale. Hind wings dark grey; cilia grey.

Mt. Murud, 4500 feet, one specimen.

XYLORYCTIDAE.

PTOCHORYCTIS PERIGRAMMA n. sp.

♀ 23 mm. Head white. Palpi fuscous. Thorax white (damaged). Fore wings oblong, costa gently arched, termen slightly sinuate, somewhat oblique; 3 and 4 stalked; white; a fine slightly irregular curved fuscous line from $3/4$ of costa to termen before tornus; cilia white. Hind wings grey-whitish; cilia white.

Mt. Poi, 5000 feet, one specimen.

PANSEPTA EREBOGLAUCA n. sp.

♂ 25 mm. Head, collar, and palpi white. Antennal ciliations $1\frac{1}{2}$. Thorax light violet-grey. Abdomen dark grey. Fore wings elongate-triangular, apex rounded obtuse, termen slightly rounded, somewhat oblique; dark violet-grey; a suffused gradually attenuated whitish streak along costa from base to $5/6$; cilia grey. Hind wings with 6 and 7 short stalked; dark fuscous; cilia grey, a darker basal shade.

Mt. Poi, 4500 feet, one specimen.

MALACOGNOSTIS n. g.

Head with appressed scales, side tufts loosely raised; ocelli inferior; tongue obsolete. Antennae $3/5$, in ♂ evenly ciliated, basal joint moderate, without pecten. Labial palpi long, recurved, second joint reaching base of antennae, rather thickened with appressed scales terminal joint shorter than second, moderate, pointed. Maxillary palpi obsolete. Posterior tibiae clothed with rough hairs above. Fore wings with 1b furcate, 2 from before $3/4$, 3 from angle, 3--5 approximated at base, 8 and 9 out of 7, 8 to apex, 11 from beyond middle. Hind wings over 1, subovate, cilia $1/5$; 3 and 4 short stalked, 5 parallel, equidistant, 6 and 7 connate.

Near *Athrypsiastis*.

MALACOGNOSTIS TERMATIAS n. sp.

♂ 29 mm. Head, thorax, abdomen white. Antennae grey, ciliations 1. Palpi white; second joint dark fuscous except apex. Fore wings elongate-triangular, termen slightly rounded, little oblique; glossy white; a terminal series of slight elongate dark grey marks; cilia white. Hind wings and cilia white.

Mt. Dulit, one specimen.

HYPEURYNTIS NEUROMETRA n. sp.

♀ 28 mm. Head and thorax white irregularly mixed brownish. Palpi white sprinkled brown, basal third of second joint, and base and apex of terminal joint except extreme tip dark fuscous. Fore wings moderate, costa moderately arched, termen hardly rounded, little oblique; white irregularly sprinkled brown; markings brown, partially suffused dark grey; some suffusion on base of costa; a slender streak beneath middle from near base to first line; three ill-defined or interrupted oblique transverse lines rising from small costal marks, first nearly straight, from before $1/3$ of costa to middle of dorsum, second from costa before middle strongly excurved in disc round small second discal stigma and returning to dorsum at $2/3$, third from costa at $2/3$ strongly excurved to dorsum before tornus; veins towards costa posteriorly marked with short dark grey lines; cilia white barred brownish, on costa spotted dark brown. Hind wings pale grey, cilia white, a light grey subbasal shade.

Tutau River, one specimen. Truly related to the typical species from New Zealand.

CARPOSINIDAE.**METROGENES n. g.**

Antennae in ♂ with long fine ciliations. Palpi long, porrected, densely scaled throughout. Fore wings with 2 from towards angle, 3--5 nearly approximated from angle, 7 and 8 nearly connate, 9 absent. Hind wings with slight cubital pecten; 3 and 4 stalked, 5 and 6 absent.

METROGENES DELTOCYCLA n. sp.

♂ 16 mm. Head white. Palpi white, oblique, basal half black. Thorax white, shoulders grey. Fore wings elongate, costa gently arched, apex pointed, termen faintly sinuate,

oblique; whitish suffusedly irrorated light brownish, forming streaks on veins; a narrow brown basal patch, widest on costa, angles blackish; a costal streak of brown suffusion from this to an irregular ill-defined subtriangular patch of chestnut-brown suffusion extending on costa from before $1/3$ to beyond $2/3$ and reaching half across wing, posterior edge darker and mixed blackish, costal edge of this marked with four blackish dots; a triangular blackish blotch in disc at $1/3$ preceding this; small round black white-circle spots towards costa before and beyond middle, and one in middle of disc; two blackish marks on termen towards middle; cilia whitish-grey, slightly speckled darker on basal half. Hind wings grey-whitish, somewhat greyer towards costa; cilia whitish.

Mt. Murud, 7200 feet, one specimen.

GLYPHIPTERYGIDAE.

HOMOPLASTIS n. g.

Head with appressed scales; ocelli bright, posterior; tongue rudimentary. Antennae little over $1/2$, basal joint short, without pecten. Labial palpi short, curved, subascending, second joint shortly rough-scaled beneath, terminal joint very short, obtuse. Maxillary palpi obsolete. Posterior tibiae loosely scaled above. Fore wings with 1b long-fusate, 2 from $5/6$, 3 from angle, 7 to apex, 8 and 9 rather approximated, 11 from middle. Hind wings nearly 1, ovate, cilia $1/3$; 3 and 4 connate, 5-7 nearly parallel; no cubital pecten.

Apparently allied to the ancestors of *Eupselia*.

HOMOPLASTIS AGATHOCLEA n. sp.

♀ 15 mm. Head dark bronzy-fuscous, forehead pale blue-metallic. Palpi fuscous. Thorax dark fuscous, mixed pale blue-metallic. Fore wings moderate, posteriorly dilated, costa gently arched, apex rounded, termen obliquely rounded; black-fuscous; a basal patch of several irregular interrupted blue-leaden striae, edge angulated on fold; a fascia of two irregular blue-leaden striae from $1/3$ of costa to middle of dorsum, on costa triple separated with ferruginous, white on costal edge, in disc angulated with some ochreous suffusion, rounded angle, on dorsal fourth suffused with whitish; beyond this on lower $2/3$ a curved violet-blue-metallic fascia, limited above by a chestnut-brown longitudinal streak, and containing near upper end a sub-oval yellow-whitish spot; three posterior

irregular blue-leaden lines, white on costal edge, first strongly curved from $3/5$ of costa dorsum before tornus, second near and parallel to this, enveloped in a pale yellowish fasciate streak except at lower end, third straight, praeapical; some whitish-ochreous suffusion along posterior third of costa; two blue-leaden dots on apical margin; cilia grey barred whitish-yellowish. Hind wings light ochreous-yellow; a dark grey band round all margins, irregular and partly suffused on dorsum; cilia pale greyish, a dark grey basal line.

Mt. Murud, 6300 feet, one specimen.

IMMA SPECTROPIS n. sp.

♀ 21 mm. Head, palpi, thorax fuscous. Fore wings moderate, slightly dilated, termen slightly rounded, little oblique; 7 and 8 stalked, 8 to apex; dark fuscous; a large rounded patch of whitish-fuscous suffusion surrounding cloudy dark fuscous second distal stigma and almost touching costa and dorsum, veins on this patch suffused rather dark fuscous; cilia whitish-ochreous, a greyish subbasal shade, costal and tornal cilia grey. Hind wings dark grey; cilia as in fore wings.

Mt. Poi, 5300 feet, one specimen.

HYPONOMEUTIDAE.

ANTICRATES DESPOTICA n. sp.

♂ 18 mm. Head yellow, back of crown crimson. Palpi crimson, tip yellow. Thorax crimson, a posterior yellow spot, collar yellow with three small crimson marks. Fore wings elongate, rather dilated, termen rather obliquely rounded; 7 and 8 stalked; crimson; markings yellow; a dot in middle of base, and a subcostal streak towards base; 14 rounded or subtriangular spots, viz., 3 in a series from beneath costa at $1/4$ to above dorsum near base, 4 in a parallel series beyond this of which the two discal are small, four in a parallel series from costa to fold beyond this, 3 in a series from disc at $3/4$ to dorsum beyond middle; fine lines on veins 4-10 posteriorly; an irregular streak running round costa posteriorly and termen, interrupted between 9 and 10; cilia crimson. Hind wings and cilia pale dull crimson.

Mt. Murud, 6300 feet, one specimen.

ANTICRATES MESOPERCNA n. sp.

♀ 18 mm. Head deep yellow, a crimson mark on back of crown. Palpi yellow, second joint with a crimson streak. Thorax deep yellow, posterior third crimson. Abdomen pale crimson. Fore wings elongate termen rather obliquely rounded; 2 and 3 stalked, 7-9 separate; deep crimson, suffused rather dark slaty-fuscous in disc except towards margins of markings; markings clear yellow; a fascia from middle of costa to 3/4 of dorsum, interrupted in middle, costal portion much broader; an elongate spot along dorsum beyond this, a small spot above its posterior extremity, and one near dorsum in middle; an inwards-oblique fasciate spot from dorsum before tornus, not reaching half across wing; semicircular spots on costa towards apex and on termen below middle, connected by an irregular line round apical margin; cilia yellow a crimson blotch on tornus. Hind wings light dull ochreous-rosy; cilia rosy-whitish.

Mt. Penrissen, 4400 feet, one specimen.

LYONETIADAE.

OPOGONA DIMIDIATELLA Zell.

Mt. Murud, 4500 feet, one specimen.

TINEIDAE.

SCARDIA BUCEPHALA Smell.

Lio Matu, one specimen.

CRANEODES SEQUESTRATA n. sp.

♂ 22 mm. Head pale greyish-ochreous. Palpi pale greyish-ochreous externally suffused dark fuscous except tips of joints, second joint with scales rather rough beneath. Antennal ciliations 1. Thorax white with some fuscous scales, patagia suffused fuscous. Fore wings elongate somewhat dilated, costa posteriorly moderately arched, termen slightly rounded, oblique; prismatic-white, with scattered fuscous and dark fuscous scales; anterior half of costa irregularly spotted dark fuscous suffusion; a fuscous blotch mixed blackish occupying

anterior $2/5$ and reaching half across wing; two or three small dark fuscous spots posteriorly. Hind wings pale greyish; cilia grey-whitish.

Mt. Murud, 4500 feet, one specimen, in indifferent condition, but the species is easily recognisable and interesting, the other species of the genus being South American; with these it agrees entirely in characters and appearance, except that the second joint of palpi is rather rougher beneath.

CHIONOREAS n. g.

Head with dense rough hair scales, longest on face; ocelli posterior: tongue very short: some long cilia from lower orbit of eye. Antennae $5/6$, in ♂ simple, joints closely set, basal joint moderate, with very long compressed fringe-tuft of dense scales, terminal joint short, obtuse, resting on apical scales of second.

Maxillary palpi very short, simple, porrected. All tibiae clothed with fine rough spreading hairs. Fore wings with 1b furcate, 2 from near angle, 7 and 8 stalked, 7 to costa, 9 and 10 approximated, 11 from towards base. Hind wings under 1, ovate-lanceolate, cilia 1; 2 remote, 3 and 4 parallel, 5 and 6 closely approximated at base, 7 parallel.

A development of *Tinea*.

CHIONOREAS EURYOCHTHA n. sp.

♂ 20 mm. Head and palpi light fuscous. Thorax darker fuscous a white posterior dot. Legs snow-white. Fore wings elongate, costa gently arched, apex tolerably pointed, termen very obliquely rounded: brownish-fuscous sprinkled dark fuscous, with glossy violet reflections; a broad white costal streak from base to near apex, extremities pointed, edge somewhat irregular; a white apical dot; cilia whitish-ochreous, with 3 or 4 bars of dark grey irroration, on tornal area, whitish suffusedly irrorated dark grey. Hind wings pale brassy-grey; cilia ochreous-white.

Mt. Murud, 6300 feet, one specimen.

ELATOBIA DELTOPHRACTA n. sp.

♀ 15 mm. Head white, face fuscous. Palpi dark fuscous (injured). Thorax white, shoulders dark fuscous. Fore wings elongate apex pointed, termen very obliquely rounded; white, suffused pale ochreous-yellowish on posterior third and towards fold except at base; a blackish costal streak from base to a triangular blackish patch which extends on costa from before middle to near $3/4$, and reaches $2/3$ across wing; cilia whitish-

ochreous, some minute blackish speckling on costa towards apex. Hind wings grey; cilia whitish.

Mt. Murud, 4500 feet, one specimen.

TINEA IMPROVISA n. sp.

♀ 16 mm. Head orange, middle of face and middle of crown white. Palpi orange, terminal joint suffused white with base and a median ring blackish. Thorax white, anterior third orange. Fore wings light orange; markings snow-white, finely black-edged; a dot on costa near base; a moderate fascia at 1/3, posterior edge concave between costa and an angular projection on fold; a spot on dorsum before tornus; an oblique expanding trapezoidal blotch from costa beyond middle, and an elongate blotch along upper part of termen with anterior end narrowed and curved up to touch middle of posterior end of this; above terminal blotch a blackish-grey elongate blotch irrorated white; a fine very oblique white line from costa at 2/3 running into apical end of terminal blotch; cilia orange, white bars above and below apex. Hind wings with 5 and 6 short stalked; light grey, anteriorly suffused ochreous-whitish; cilia whitish.

Mt. Dulit, 3000 feet, one specimen. The nearest approach to this very distinct species is *calycodes* from Solomon Islands.

TINEA PHAEDROPIS n. sp.

♂ 14 mm. Head light ochreous-yellow. Palpi blackish, tip pale yellowish. Antennae grey. Thorax yellow, patagia blackish. Abdomen ochreous-whitish. Fore wings pointed, termen very obliquely rounded; 4 and 5 stalked, 7 and 8 stalked; bright yellow, with a very faint greenish tinge; markings irregular, ill-defined, grey irrorated black; dots on base of costa and dorsum; a thick streak along fold from near base to near middle of wing; elongate costal antemedian and postmedian patches; a thick streak from middle of disc to tornus; an irregular streak along termen, interrupted in middle; cilia yellowish, basal half irregularly sprinkled dark fuscous. Hind wings grey; cilia ochreous-whitish.

Mt. Murud, 6500 feet, one specimen.

TINEA STREPSINEURA n. sp.

♀ 27--28 mm. Head yellow-ochreous. Palpi and antennae dark fuscous. Thorax greyish-ochreous, speckled grey, especially anteriorly. Abdomen yellow-ochreous. Fore wings

with apex obtuse, termen very obliquely rounded; glossy greyish-ochreous, with fine indistinct greyish transverse strigulation, more distinct posteriorly; cilia greyish-ochreous speckled grey. Hind wings with lower margin of cell sinuate, 2 from middle, 3 from $3/4$, 4 from angle, 5 rather approximated to 4, 6 and 7 rather approximated towards base; dark purple-grey; cilia grey-whitish.

Pah Trap, two specimens. Also one in my collection (smaller, 22 mm., but with the characteristic peculiar neuration, and undoubtedly identical), from Padang Ranges, Malay States.

TINEA PLATYPHAEA n. sp.

♂ ♀ 25-26 mm. Head yellow. Palpi dark fuscous, terminal joint ochreous-yellowish. Antennae ochreous-whitish. Thorax fuscous, anteriorly darker and violet tinged. Abdomen rather deep yellow-ochreous. Fore wings rather broad, apex obtuse, termen rather obliquely rounded; bronzy-fuscous, faintly violet-tinged; cilia pale bronzy-fuscous, speckled darker fuscous. Hind wings with 3 and 4 approximated at base, transverse vein very oblique outwards from 4 to 5; rather dark bronzy-grey or purple-grey; cilia pale grey, whitish-tinged towards tornus.

Mt. Poi, 4500 feet, two specimens.

TINEA PERSEVERANS n. sp.

♂ 19 mm. Head ochreous, rather deeper on crown. Palpi pale ochreous suffused grey externally. Antennae ochreous. Thorax light ochreous, anterior half suffused dark purple-fuscous. Abdomen ochreous yellowish, banded light violet-brownish. Fore wings elongate, costa moderately arched, apex obtuse, termen very obliquely rounded; light glossy yellow-ochreous, with faint fine fuscous freckling; cilia light yellow-ochreous, speckled fuscous. Hind wings with 2 remote, 3-5 somewhat approximated basally; grey with brassy reflections; cilia grey-whitish.

Mt. Poi, 4500 feet, one specimen.

TRACHYRRHOPALA n. g.

Head loosely rough-haired; ocelli posterior; tongue obsolete. Antennae $4/5$, joints loosely set, basal joint rather large, stout. Labial palpi long, curved, ascending, laterally compressed, thickened with rough projecting scales anteriorly throughout, terminal joint as long as second, obtuse. Maxillary palpi

moderately long, several jointed, folded, filiform. Posterior tibiae rough-haired above. Fore wings with tuft of scales on fold; 1b furcate, 2 from towards angle, 7 absent, 11 from towards base. Hind wings nearly 1, elongate-ovate, almost pointed, cilia nearly 1; 2--7 tolerably parallel.

TRACHYRRHOPALA PAUROLEUCA n. sp.

♀ 16 mm. Head ochreous-grey-whitish. Palpi ochreous-grey whitish, externally irrorated dark grey. Thorax grey-whitish, anterior third dark grey. Fore wings elongate, costa moderately arched, apex obtuse-pointed, termen extremely obliquely rounded; greyish-ochreous, irregularly and suffusedly irrorated dark fuscous; an undefined spot of whitish suffusion on middle of costa; an elongate suffused white spot beneath fold before middle of wing, with a tuft of scales; some white suffusion at apex; cilia light grey mixed whitish. Hind wings dark grey; cilia grey.

Mt. Dulit, 3000 feet, one specimen, in poor condition.

PLAESIOSTOLA n. g.

Head rough-haired; ocelli posterior; tongue absent. Antennae 1/2, basal joint without pecten. Labial palpi moderately long, curved, ascending, loosely rough-scaled anteriorly throughout, second joint with 2 or 3 lateral projecting bristles, terminal joint shorter than second, pointed. Maxillary palpi absent. Posterior tibiae clothed with hairs above. Fore wings (apparently with some raised scales) with 1b furcate, 2 from near 4/5, 3 from angle, 7 and 8 stalked, 7 to costa, 9 and 10 approximated to 7, 11 from towards base. Hind wings 1, elongate-ovate, obtuse-pointed, cilia 4/5; 2--4 parallel, 5--7 rather approximated towards base.

PLAESIOSTOLA DIAPLINTHA n. sp.

♀ 19 mm. Head whitish-ochreous. Palpi dark fuscous, terminal joint whitish-ochreous towards base and apex. Thorax grey-whitish, anterior margin dark fuscous. Fore wings elongate, costa gently arched, apex tolerably pointed, termen very obliquely rounded; pale ochreous mixed white, forming an irregular marbling, with a few scattered black scales; a small quadrate black spot on costa near base; larger quadrate black spots on costa before 1/3, and at middle and 2/3; an oblong black spot in disc at 3/5; cilia pale ochreous. Hind wings light grey; cilia whitish-ochreous.

Mt. Murud, 6300 feet, one specimen.

XII.—An Account of some Geometrid Moths collected in Sarawak. By L. B. PROUT, F.E.S.

(With one Plate.)

The Geometrids of these collections, with the exception of a few species which are common almost everywhere, are exceedingly interesting and form a very valuable contribution to our knowledge both of the fauna of Sarawak in particular and of the geographical distribution of the family in general. The large number of species relatively to the total of specimens suggests how rich must be the resources of the mountains worked, although it has occasionally been a slight obstacle to the complete working-out of the material, as little can be made of single specimens (especially if ♀ or aberrations or in poor condition) of obscure species. However, it has been found possible to describe adequately a considerable number of novelties, some of them quite striking; thirteen are dealt with in the present instalment and several others are awaiting description.

Of the species not hitherto recorded from the Malayan subregion, some, as would be expected, belong chiefly to India and Burma, but a few find their affinities in New Guinea. Special attention may be called to the very interesting case of *Horisme murudensis* of the Mt. Murud collection.

Unfortunately the dates of capture (and consequently the exact altitude, for which our only clue was in the list of dates), are not quite complete, as the smaller specimens were unfortunately packed two or more in one paper and uncertainties arose as they passed from hand to hand in setting and preliminary sorting out; otherwise the data are very good.

SUBFAM. OENOCHROMINAE.

1. SARCINODES DEBITARIA Wlkr.

Auxima debitaria Wlkr., List Lep. Ins., xxvi, p. 1527, 1862, Darjeeling.

Bakong—1 ♀.

Males of this species are sent quite commonly in collections from North India and Swinhoe (Cat. Lep. Het. Oxf. Mus., ii, p. 320) records it from Sumatra, but there are no females in any collection to which I have access. Dr. Mjöberg's specimen is different in upperside coloration from the male, but I forbear to pronounce upon its status without further material.

2. EUMBLEA LUDOVICATA Guen.

Eumblea ludovicata Guen., Spec. Gén. Léop., ix, p. 393, 1858, Ceylon.

Mt. Murud (?)—1 ♀.

This species is distributed, in various races, throughout nearly the entire Indo-Australian region. As at present understood, the name-typical race ranges from India to Formosa and to the Malay Peninsula and Sunda Islands (see Seitz Macrolep., xii, p. 31), but further subdivision may prove possible.

3. DERAMBILA PROPAGES sp. n.

♂ 27 mm.

Head white. Palpus unusually long for the genus, the second and third joints each measuring fully 6 mm.; white, partly suffused on outer side with light-brown, the terminal joint mostly dark. Antennal ciliation rather long (only one antennal stump remaining in the unique type). Thorax and abdomen mostly white; abdomen tufted beneath. Legs mostly white; hind tibia very long, dilated, fringed above; (tarsus?).

Fore wing shaped about as in *zincaria* Guen.; iridescent white; costal margin light grey-brown, more broadly even than in *lumenaria* Hb.-Gey.; cell-dot large, subtriangular black; lines light-brown; antemedian angled outward behind SC, then oblique inward, forming large spots on M--M² and at hind margin; postmedian almost as in *lumenaria* but with the spots larger; subterminal macular, as in *lumenaria*, but almost touching termen; terminal dark line fine and slight. Hind wing with SC² well separate; markings nearly as in *lumenaria* but thicker; subterminal nearly as on fore wing, rather smaller.

Underside iridescent white; fore wing with a black cell-spot and slightly shaded costa; lines almost entirely obsolete.

Mt. Dulit, 3000 feet.

At first sight suggests a heavily marked *lumenaria*, though not even in the same group as regards generic structure.

4. DERAMBILA SAPONARIA Guen.

Zandopteryx saponaria Guen., Spec. Gén. Léop., x, p. 16, 1858, Ceylon.

Lio Matu, December—1 ♂.

Range. India, Malay Peninsula, Borneo, Banka, Philippines.

5. ALEX PALPARIA Walk.

Panazra palparia Walk., List Lep. Ins., xxiii, p. 988, 1861, Hindustan.

Alex niasica Swinh., Ann. Mag. Nat. Hist. (8), xix, p. 416, 1917 (syn. nov.), Nias.

Mt. Murud (?)—1 ♀.

The specimen belongs to the ab. *obsoleta* Warr.; Nov. Zool., i, p. 368, = *niasica* Swinh.

Range.—About as in the preceding species.

6. OZOLA BASISPARSATA Walk.

Carima basisparsata Walk., List Lep. Ins., xxvi, p. 631, 1862, Sarawak.

Lio Matu, December—1 ♂.

Range.—Malay Peninsula to Queensland and the Louisiades.

SUBFAM. HEMITHEINAE.

7. NEOBALBIS FLAVIBASALIS Warr.

Actenochroma flavibasalis Warr., Nov. Zool., i, p. 381, 1894, Java.

Bakong—1 ♂.

This species seems to be localised in the Malay Peninsula, Java, Sumatra, and Borneo and never taken in large numbers. The Mjöberg specimen is a rather grey aberration.

8. PINGASA CHLORA *crenaria* Guen.

Hypochroma crenaria Guen., Spec. Gén. Ins., ix, p. 278, 1858, Central India.

Pah Trap, November—1 ♂.

Pingasa chlora Cram. is very generally distributed in the Indo-Australian region; the race *crenaria* (not very sharply differentiated but generally separable by the less acutely angled antemedian line) in India, the Malay Peninsula and adjacent islands, S. China, and Formosa.

9. *TERPNA VIGENS ruficoloraria* Warr.

Terpna ruficoloraria Warr., Nov. Zool., iv, p. 32, 1897, Borneo.

Mt. Murud, 6000--6500 feet, November—1 ♂.

T. ruficoloraria is only known to me from Penang, Borneo, and Sumatra, but I have tolerable confidence in referring to it as a redder race than the Indian *vigens* Butl.

10. *DYSPHANIA TRANSDUCTA* Walk.

Euschema transducta Walk., Journ. Linn. Soc. Zool., vi, p. 94, 1861, Borneo.

Hazis doubledayi Snell., Tidj. Ent., xxvii, pp. lxxxiii and 97, 1884, Malay Peninsula.

Pah Trap, November—1 ♂.

11. *ORNITHOSPILA SUBMONSTRANS submonstrans* Walk.

Geometra submonstrans Walk., List Lep. Ins., xxii, p. 526, 1861, Sarawak.

Mt. Murud, 6000--6500 feet. October--November—2 ♂, 3 ♀.

Range. Malay Peninsula, Sumatra, Borneo, Celebes; the race *moluccensis* Prout (Nov. Zool., xxiii, p. 202), on Batjan and Ohi.

12. *ORNITHOSPILA BIPUNCTATA* Prout.

Ornithospila bipunctata Prout, Nov. Zool., xxiii, p. 201, 1916, Natuna Is.

2 ♂, the exact data lost (believed Mt. Murud, certainly belonging to that expedition).

Range.—Malay Peninsula, Borneo, Natuna Islands, Celebes.

13. *OSTEOSEMA DISCATA* Warr.

Chlorostrota discata Warr., Nov. Zool., iv, p. 389, 1897, N. Borneo.

Mt. Murud, November—1 ♂; Mein Plateau, November—1 ♂.

Apart from Warren's type, I have hitherto only seen this interesting species from the Philippines. Coll. Wileman.

14. *ULIOCNEMIS BIPLAGIATA* Moore.

Comibaena biplagiata Moore, Lep. Ceyl., iii, p. 435, 1887, Ceylon.

Mt. Murud, November—1 ♂.

On account of the morphological difference I was certainly wrong (Gen. Ins. Geom. Hemith., p. 91), in regarding this species as conspecific with the one that formerly passed as *cassidara* Guen., recte *castalaria* Oberth. (Et. Lép., xii, p. 106, pl. 388, f. 3268). Superficial distinctions are very slight.

but *biplagiata* has the postmedian of hind wing slender and slightly *incurved* between R^3 and M^2 , while in *castalaria* it is here thicker and perfectly straight. Moreover, the apical patch of the hind wing in the ♂ of *biplagiata* is predominantly rufous or apricot orange, whereas in *castalaria* it is darker and duller, more mixed with violet and black. The known range of *biplagiata* is Ceylon. Java. Sumatra, Borneo, the Natuna Islands, and Celebes; eastward it is represented by *subornataria* Rothsch. = *ceramicaria* Oberth. (Ceram) and *elegans* Warr. (New Guinea, Louisiades, etc.).

15. THALASSODES QUADRARIA Guen.

Thalassodes quadraria Guen., Spec. Gén. Lép., ix, p. 360, 1858. ♀
Central India.

Pah Trap, November—1 ♂.

Range.—India, Formosa, Penang, Sumatra, Borneo, Celebes.

16. THALASSODES IMMISSARIA Walk.

Thalassodes immissaria Walk., List Lep. Ins., xxii, p. 553, 1861, Ceylon.

Lio Matu, December—1 ♂.

In Lep. Cat., 14, p. 96, I cited this name with a query to *depulsata* Walk., but unfortunately it really supplants *opalina* Butl., which, however, may be a North Indian race. India, Burma, Hainan, Formosa. Other forms, differing very little from typical *immissaria*, reach away to New Guinea and Queensland and are known as *rhytipporus* Lower.

17. THALASSODES CURIOSA Swinh.

Thalassodes curiosa Swinh., Trans. Ent. Soc. Lond., 1902, p. 673, Penang.

Mt. Murud, 6500 feet, November—2 ♂; Mt. Poi, 5200 feet—1 ♂.

Known to me also from the Khasia and Jaintia Hills, Assam.

18. IODIS sp.

Mt. Penrissen, 4400 feet—1 ♀.

Extremely discoloured. Appears to have been of a dark grey-green, somewhat as in *inumbata* Warr., the palpus with terminal joint very long, fore wing with SC^1 arising close to apex of cell, costal edge dotted, postmedian line strongly and irregularly dentate, much as in *sinuosaria* Leech but less extreme at fold.

19. CHLOÈRES DYAKARIA Walk.

Eucrostis dyakaria Walk., List Lep. Ins., xxii, p. 567, 1861, ♂ Sarawak.
Cosmostola dyakaria Swinh., Cat. Lep. Het. Oxf. Mus., ii, p. 396,
 pl. vi, f. 9, 1900, ♂.

Chloères dyakaria Prout, Gen. Ins., pp. 129, 240, 1912, ♂.

Mt. Poi, 4350 feet—1 ♀ (neallotype).

Similar to the ♂ as described by Walker and figured by Swinhoe; palpus long and slender, with the terminal joint rather strongly elongate, as in *Comostolopsis*, to which genus—in spite of the non-stalking of M¹ of the fore wing and very short stalking of the same vein on the hind wing—it ought probably to be transferred. Really transitional. Apparently an extremely rare species.

SUBFAM. STERRHINAE.

20. PTOCHOPHYLE OZOPHANES Prout.

Ptochophyle ozophanes Prout, Ann. Mag. Nat. Hist. (9), i, p. 22, 1918, Perak.

Mt. Dulit, 3000 feet—1 ♂.

Described from a single male in Coll. Joicey. I have since seen only one other example, from Pahang, in Coll. Fed. Malay States Museum.

21. ANISODES SUBROSEA Warr.

Perixera subrosea Warr., Nov. Zool., xiii, p. 91, 1906, British New Guinea.

Mt. Murud, ? 6500 feet, November—1 ♂.

Seems indistinguishable from the most black-marked New Guinea examples, though more material might be expected to reveal some racial difference. Hitherto only known from Dutch and British New Guinea. Several of the species in this genus have a remarkably wide distribution.

22. ANISODES ABSCONDITARIA Walk.

Anisodes absconditaria Walk., List Lep. Ins., xxvi, p. 1580, 1862, South Hindustan.

Mt. Murud, 6000--6500 feet, November—1 ♀.

Distributed in India, Malay Peninsula, Formosa, and the Greater Sunda Islands.

23. ANISODES DECRETARIA Walk.

Anisodes decretaria Walk., List Lep. Ins., xxii, p. 650, 1861, Sarawak.

Mt. Murud, November—3 ♀.

The most typical forms are perhaps confined to Borneo and Singapore, but I doubt whether *pallida* Moore (Lep. Ceyl. iii, p. 445, pl. 201, f. 11, Ceylon, N. India, Malay Peninsula, Formosa), is definitely separable even racially.

24. ANISODES SEMICOMPLETA Walk.

Anisodes semicompleta Walk., List Lep. Ins., xxii, p. 651, 1861, Sarawak.

Anisodes immemoraria Walk., List Lep. Ins., xxv, p. 1618, 1866, Java.

Anisodes strictaria Snell., Tijd. v. Ent., xxiv, p. 81, pl. viii, f. 7, 1881, Celebes.

Emmesura semicompleta Warr., Nov. Zool., v, p. 20, 1898.

Lio Matu, December—1 ♂.

Perhaps commonest in Borneo, but reaches Java, Assam, Hainan, the Philippines and Celebes and may be expected from Sumatra. May have to sink to *illegidaria* Guen. (Spec. Gén. Léop., ix, p. 421, Sarawak), but it is very hard to reconcile.

25. ANISODES PYRRHOCRICA sp. n.

♂ 31 mm.

Face dull purple-red in upper half, whitish-buff in lower. Palpus moderate, terminal joint moderately long (nearly half second); crimson above, pale beneath. Vertex, thorax and abdomen whitish-buff, abdomen somewhat mixed with roseate scaling above. Antennal shaft mostly reddened except at base and tip. Fore leg reddened on upper and inner sides; hind leg simple, the tibia with two unequal spurs, the tarsus long.

Fore wing without areole; termen almost smooth; fore wing buffish-white-grey, with crimson irroration, giving it a fleshy tinge; a black cell-dot; antemedian marked by five blackish dots, irregularly placed, the three on veins (SC, M, and SM²) forming a very slight curve, oblique inwards posteriorly, the two on folds more distally, especially that in cell; median about midway between cell-dot and postmedian, grey not very concise, sharply dentate outward on veins, incurved between the radials and between M⁴ and SM²; postmedial about 2 mm. from termen, receding anteriorly, marked chiefly by vein-dots, that on R² elongate and more

proximal; subterminal indicated by vague grey shades, the proximal one interrupted, especially about cellule 3; termen with sharp black interneural dots. *Hind wing* with termen feebly subcrenulate; a bright orange discal ocellus of about 1 mm. diameter, with a small pale yellow pupil; lines and terminal dots of fore wing continued, the median and postmedian lines rather more proximal.

Fore wing beneath almost entirely covered with rosy suffusion, leaving a narrow mottled terminal area and a clear hind area (behind submedian fold); cell-dot and terminal dots present. *Hind wing* beneath almost all pale; some rosy suffusion at costa (especially apically); postmedian dots and some ill-defined subterminal spots rosy.

Mt. Murud, November.

A rather smaller, paler, worn ♂ from the Poeh Mts. is in Coll. Tring Museum.

26. ANISODES MONETARIA Guen.

Anisodes monetaria Guen., Spec. Gén. Léop., ix, p. 418, 1858, Borneo.

Anisodes areolaria Guen., Spec. Gén. Léop., ix, p. 418, 1858 (ab.), Borneo.

Anisodes argentispila Warr., Proc. Zool. Soc. Lond., 1893, p. 361 (ab.), Naga Hills.

Anisodes hyperythra Swinh., Ann. Mag. Nat. Hist. (6), xiv, p. 135, 1894 (ab.), Khasia Hills.

Mt. Murud, 6500 feet, November—1 ♂.

There can be no doubt that the names cited above refer to forms of a single variable species. The Mt. Murud example belongs to ab. *hyperythra* Swinh.

Range. Ceylon, N. India, Malay Peninsula, Borneo.

27. NOBILIA TURBATA Walk.

Nobilium turbatum Walk., List Lep. Ins., xxiv, p. 1098, 1862, Sarawak.

Plutodes strigularia Snell. in Veth, Midden-Sumatra, iv, 1 (2), p. 57, 1880, Sumatra.

Lio Matu, December—1 ♂; Mt. Poi, 4300 feet, October—1 ♂.

Lord Rothschild has pointed out (Proc. Zool. Soc. Lond., 1922, pp. cxxxii--cxxxiii), that the supposed races of this species have become so differentiated in the ♂ genitalia "that interbreeding would be difficult," i.e., that they would have virtually attained the rank of species. True *turbata* is thus confined to the Malay Peninsula, Sumatra, Java, and Borneo.

28. NOBILIA OBLITERATA Warr.

Nobilias obliterata Warr., Nov. Zool., iv, p. 220, 1897, Borneo.

Foot of Mt. Dulit—1 ♂.

Only known from Borneo and even there far less frequent than the preceding species.

29. PROBLEPSIS ALBIDIOR Warr.

Problepsis albidior Warr., Nov. Zool., vi, p. 33, 1899, N.W. India.

Mt. Murud, November (?)—1 ♂. Rather wasted.

This species was hitherto known to me from N. India, S. Japan, the Liu-Kiu Islands, and Formosa, and a close relative (probable race) in New Guinea (*magna* Warr., 1906). The present record helps to bridge over one of the wide gaps in distribution, but it is not unlikely that—as with *Nobilias turbata* and others—close anatomical work may reveal the existence of an assemblage of representative species.

30. SCOPULA VACUATA Guen.

Acidalia vacuata Guen., Spec. Gén. Lép., ix, p. 504, 1858, Sarawak.

Lio Matu, rather small, worn—1 ♂.

Only known from Borneo.

31. SCOPULA RUFISTIGMA Warr.

Craspedia rufistigma Warr., Nov. Zool., ii, p. 93, 1895, Khasia Hills.

Mt. Murud, 7200 feet, November (?)—1 ♂.

Apart from Assam examples. I have only seen this insect from Kinabalu.

32. SCOPULA OEDOCNEMIS sp. n.

♂ 26 mm.

Face black. Palpus black, beneath pale ochre-brownish. Vertex white. Occiput black. Antennal shaft blackish, at extreme base white; ciliation fine and long (in proximal part nearly 3). Thorax and abdomen whitish-grey. Fore leg somewhat dark-mixed. Mid tibia with inner spur long, the outer considerably less than $\frac{1}{2}$ as long. Hind tibia long, greatly swollen, hair pencil whitish and pale buff; tarsus less than $\frac{1}{2}$.

Fore wing white-grey with brown-grey irroration (tone as in *bifalsaria* Prout or dusky *incanata* Linn.); cell-mark somewhat elongate, not strong; lines weak; antemedian slightly excurved in cell (here 3.5 mm. from base) then oblique inward; postmedian fine, about 2 mm. from termen, weakly sinuous; median shade well beyond cell-mark, somewhat undulating; pale subterminal rather broad and conspicuous, at least as broad as in *incanata*, the curves rather stronger; terminal line black, not or scarcely interrupted, though a little thickened between the veins; fringe weakly irrorated. *Hind wing* with termen scarcely appreciably bent in middle; cell-mark still weaker, less concise; antemedian line wanting, the rest as on fore wing, the median and postmedian slightly farther from termen.

Fore wing beneath a little more smoky, *hind wing* a little paler; both weakly marked, the postmedian line the most noticeable; terminal line brownish.

Lio Matu, December.

Probably nearest to *spissitarsata* Warr., but with termen of fore wing slightly more oblique, the lines somewhat different, cell-dots weaker, the hind tibial pencil not black-grey, the tarsus not so extremely short (in *spissitarsata* about $\frac{1}{6}$). Venation normal (in *spissitarsata* SC¹ of fore wing is stalked well beyond the end of the areole).

33. SCOPULA LEUCOPIS sp. n.

♂, ♀ 30--31 mm.

Face predominantly white, only darkened round the edges. Palpus black, pale beneath. Vertex, thorax and abdomen concolorous with wings; collar more ochreous-brown. Antennal joints of male somewhat projecting; ciliation over 1. Hind tibia of male thickened, elongate (nearly twice femur); tarsus considerably under $\frac{1}{2}$ tibia, second joint nearly $\frac{2}{3}$ length of first.

Fore wing whitish-brown, with sparse blackish irroration; cell-dot black; lines brown, not very strong; antemedian out-bent in cell and again just behind M (angled inward on M), oblique to hind margin; median moderately dentate, at the radials midway between antemedian and postmedian, anteriorly oblique inward, posteriorly oblique inward, somewhat incurved at fold; postmedian rather more concise (lunulate-dentate), the teeth accentuated by small black vein-dots, general course nearly as of median but rather less oblique posteriorly, an

inward curve between the radials more noticeable; subterminal feebly defined by weak, slightly macular shades; terminal dots strong, black, interneural, feebly connected by slight grey shading; fringe with minute dots at vein-ends. *Hind wing* with termen not noticeably bent; cell-dot rather large; antemedian line wanting; median line incurved proximally to it, angled outward on SC, M, and SM²; rest as on fore wing, postmedian rather farther from termen, subterminal shades and fringe-dots slightly stronger.

Underside rather paler, the fore wing with a little suffusion proximally, the basal part of the costa rather strongly infuscated; markings of upperside mostly indicated, but only the cell-dots, terminal dots and on the fore wing the postmedian line well-developed.

Mt. Murud, 6000--6500 feet, October, type ♂, November, paratype ♂, ♀, allotype ♀.

34. STERRHA ACTIOSARIA Walk.

Acidalia actiosaria Walk., List Lep. Ins., xxii, p. 750, 1861, Ceylon.

? *Nemoria ? damnata* Walk., List Lep. Ins., xxii, p. 756, 1861, Sarawak.

Acidalia indotaria Walk., List Lep. Ins., xxiii, p. 763, 1861, Sarawak.

Mt. Murud, 6000--6500 feet, November—5 ♀; Mt. Poi, 4500--5200 feet—3 ♀, 2 ♂; Mt. Penrissen, 2000--4400 feet—2 ♂, 1 ♀.

A very widely distributed Indo-Malayan species, or possibly assemblage of close allies which have not yet been satisfactorily worked out. In any case Swinhoe (Cat. Lep. Het. Oxf. Mus., ii, p. 362), is in error in referring *damnata* and *indotaria* (which seem to be synonymous) to *Craspedia* (*Scopula*). I suspect *squamipunctata* Warr. (1900), is an ab. of *actiosaria*.

SUBFAM. LARENTIINAE.

35. ACOLUTHA PICTARIA Moore.

Emmelesia pictaria Moore, Lep. Coll. Atk., p. 267, 1888, Darjeeling.

Mt. Murud, 6000--6500 feet, November—1 ♂.

The Malayan form may prove racially different. A small form from Hainan has already been named *imbecilla* Warr., 1905, the New Guinea race *canicosta* Warr., 1906.

36. *ACOLUTHA FLAVIPICTARIA poiensis* subsp. n.

More deeply coloured than *f. flavipictaria* Prout (Nov. Zool., xxix, p. 359, Khasia Hills; also from Ceylon in Coll. Joicey), the dark markings of the median area on both wings broadened and strengthened. Underside with blurred dusky suffusions in distal area.

Mt. Poi, 4500 feet, type and another ♂, 4400 feet—1 ♂.

37. *EOIS MIXOSEMIA* sp. n.

♂. ♀ 21--26 mm.

Group of *memorata* Walk. (List Lep. Ins., xxii, p. 657), partaking of some characters given for each of the three species which are differentiated (Nov. Zool., xxix, pp. 347--8).

Size of *memorata* Walk. Structure of *amydroscia* Prout (minute antennal ciliation and full development of areole). Coloration and markings almost exactly as in *phaneroscia* Prout, fore wing beneath less suffused. Dorsal yellow spots of abdomen not sharply defined, the rosy markings which, in the allies, generally enclose them being less evenly developed, feebly expressed excepting a strong pair of subdorsal spots near the hinder end of each segment. An aberration (2 ♂, 2 ♀) has the postmedian developed into a blackish blotch at abdominal margin of hind wing.

Mt. Murud, 6000--6500 feet, October—5 ♂, 6 ♀.

38. *POMASIA VERNACULARIA* Guen.

Pomasia vernacularia Guen., Spec. Gén. Léop., ix, p. 427, 1858, Sarawak.
Pomasia gelastis Meyr., Tr. Ent. Soc. Lond., 1897, p. 70, Pulo Laut.

Mt. Dulit, 3000 feet, January, typical—1 ♂; Mt. Murud, 6500 feet, November—1 ♂, 1 ♀, rather bright, the ♀ larger; Mt. Murud (?) November—1 ♂, also bright, still larger.

Apart from the localities cited in the above synonymy, I know this species only from the Malay Peninsula. It may be noted that Meyrick (loc. cit.) misidentified *conferta* Swinh. (1902), as *vernacularia* and consequently named the wrong species.

39. *COLLIX EXAMPLATA* Warr.

Collix exemplata Warr., Nov. Zool., xiii, p. 98, 1906, Angabunga River, British New Guinea.

Mt. Poi, 4850 feet—1 ♀; Mt. Penrissen, 4400 feet—1 ♀.

I cannot at present separate the examples here recorded from Warren's species, which inhabits the Moluccas and New Guinea. Perhaps the ♂ will throw further light on it.

40. *COLLIX BLOSYRA* sp. n.

♂ 43 mm.

Head and body concolorous with wings. Palpus not quite 2; Sudan-brown or slightly yellower, with a blackish patch beneath base of second joint and blackish terminal joint. Wing-*tegulae* tipped with brown. Abdomen with some sienna latero-dorsal marks, only an elongate anterior one at all conspicuous.

Fore wing with R^1 not stalked; rather more uniformly dark than the rest of the species, in some lights with a strong purple gloss; the raised black cell-spot rather large, roundish; the transverse dark lines mostly weak, lunulate-dentate, somewhat thickened and blackened anteriorly; postmedian further defined, apart from its spot at just beyond five-eighths costa, by rather more distally placed, somewhat elongate, blackish spots in cellules 7 and 3, the latter the larger; subterminal lines fine, not very conspicuous dentate anteriorly, less so posteriorly, proximally with some irregular dark filling-in, distally with some smaller, but more regular, interneural streaks running to termen; terminal black line slightly interrupted; fringe with a fine pale line at base and a darker central one. Hind wing concolorous; cell-dot minute, followed by some pale scales; no black spots; lines weak, the postmedian least so; subterminal somewhat interrupted, but forming two conspicuous pale dots in cellules 2 and 1.

Underside rather less dark, more brownish, nearly unicolorous; cell-spot of fore wing smaller; both wings with postmedian line and cloudy praesubterminal band discernible; a fine pale line at base of fringe.

Mt. Murud, 6000--6500 feet, November.

41. *HORISME MURUDENSIS* sp. n.

♂ 27 mm.

Face whitish-grey, with a blackish spot at each corner. Palpus about 2, second joint with rough projecting scales above and rather longer, more hair-like, projecting scaling beneath, third joint moderate; blackish, at base and tip white and with some white scales above. Antennae slightly thickened, ciliation vestigial. Vertex and thorax brown-black, mixed with white, the double metathoracic crest mostly whitish. Abdomen rather elongate; above predominantly brown-black, beneath mottled with grey. Legs blackish, with slender white-grey marks at ends of joints.

Fore wing moderately elongate, apex blunt, termen smooth, gently curved, anteriorly not very oblique; grey (irrorated brown-black and white), the darker colour predominating in the basal area (except at hind margin) and in the broad median band, the white in the narrow, curved band between; median band 6 mm. wide at costa, 4 mm. posteriorly, its proximal edge slightly crenulate, its distal very slightly concave between costa and the slight projection behind R^3 , angled inward at M^1 and M^2 , outward between, then slightly crenulate to hind margin, slightly indented at SM^2 ; cell-dot small, discernible on an ill-defined pale costal space in middle of median band; whitish band outside median area very narrow; a brown line beyond it between the radials; subterminal line very fine and indistinct, shallowly lunulate-dentate, cut by an oblique apical whitish dash and accompanied distally by blackish interneural dots; terminal line broken into pairs of dots; fringe mottled, darker proximally than distally. Hind wing rather elongate costally, termen rounded, weakly crenulate; grey; termen and fringe nearly as on fore wing; a very faint postmedian indicated, bluntly angled behind R^3 .

Both wings beneath as hind wing above.

Mt. Murud, 6000-6500 feet, November.

Very interesting from its obvious affinity to a hitherto exclusively Papuan and Moluccan section of the genus; similar to *brunneata* Warr. (1906), and *genuflexa* Prout (1923).

42. *EUPITHECIA ALBIFURVA* Hmpsn.

Eupithecia albifurva Hmpsn., Journ. Bombay Nat. Hist. Soc., xviii, p. 49, pl. E, f. 8, 1907, Ceylon.

Mt. Murud, November (?)—1 ♀.

New for the Malayan subregion.

43. *EUPITHECIA EUPITHECIATA* Walk.

Phibalapteryx eupitheciata Walk., List Lep. Ins., xxvi, p. 1720, 1862, Australia.

Mt. Murud, 6000-6500 feet, October—1 ♀.

One of the few extremely widely distributed species of the genus, already known from Ceylon, India, Formosa, Malay Peninsula, Java, Borneo, Sangir, Celebes, British and Dutch New Guinea, and Australia.

44. EUPITHECIA DINOSIA sp. n.

♀ 27 mm.

Head ochreous-brown, mixed with red; frontal cone rather broad. Palpus very long (about 3), second joint rather heavily scaled, third joint elongate, smooth; light ochreous-brown with a tinge of olive. Collar coloured as palpus. Tegulae (in sens. Hmspn.) spotted with red; true (wing-) tegulae variegated, the hair at end blackish. Abdomen mixed with red dorsally, with large orange-red crests on segments 3 and 4; body beneath pale. Legs partly black-mixed; spurs long.

Fore wing glossy; areole ample; proximal one-third dark purplish, traversed and bordered by fine blackish lines and irrorated here and there with red scales; its distal edge little waved, but with a single sharp tooth just behind SC, which is almost cut off from the dark area by a few white scales; median area light brown, suffused (under the lens weakly and irregularly mottled) with red and throughout (excepting a fine pale proximal line) very finely irrorated with brown-grey; no cell-dot; postmedian line black, becoming very fine and weak posteriorly, arising at about $3/5$ costa, slightly indented at SC⁵. R² and M² with blunt lobes between the indentations; distal area paler, more olive-greyish as far as the subterminal, then predominantly red; a blackish costal patch midway between postmedian and subterminal, continued across the wing as a boundary-line to the pale double "rivulet" band of the *Larentiinae*, though becoming very faint about the medians, and merged in a brown mark between M² and hind margin; subterminal indistinct, crenulate; terminal line interrupted at the veins; fringe proximally chequered, red and blackish, centrally with a fine pale line, distally smoky. Hind wing grey, slightly paler at base, darkened at tornal end of abdominal margin; fringe proximally tinged with brown, weakly dark-spotted, distally pale greyish.

Both wings beneath glossy drab-grey, the fore wing slightly suffused with fuscous and with the principal markings very faintly indicated, the hind wing with a few shadowy brownish lines.

Mt. Murud, 6000-6500 feet, November.

Superficially recalls the African *E. nigribasis* Warr. The *Sauris*-like palpi are curious and I suspect the ♂ will present some high specialisations.

45. *EUPITHECIA DELOZONA* sp. n.

♀ 18 mm.

Palpus nearly 2, first and second joints with projecting scaling beneath, second joint with erect scales above, a small projecting tuft over the moderate third joint. Head and body pale green, discolouring to yellowish. Fore tibia and tarsus infuscated above, with pale spots at ends of joints.

Fore wing with areole ample; DC^2 slightly longer than DC^3 ; pale green, with slightly darker bands between subbasal and antemedial lines and just beyond the postmedian; basal area purple costally; lines fine, black, finely edged with white (the subbasal and postmedian outwardly, the antemedial inwardly); subbasal slightly curved anteriorly then almost straight; antemedial slightly oblique inward to M, curving to become slightly oblique outward; postmedian slightly incurved between costa and R^1 and between M^2 and SM^2 ; the entire median area deep dull purple, traversed by faint reddish and dark lines; fringe concolorous. Hind wing grey to beyond middle, then pale green.

Both wings beneath nearly as fore wing above, the grey on hind wing less pronounced.

Mt. Murud, 6000-6500 feet, November.

Near *biviridata* Warr. (Nov. Zool., iii, p. 125, Khasia Hills), termen of fore wing rather less oblique, hind wing ampler, green borders broader, that of hind wing brighter, lines rather different in shape—postmedian less protuberant, etc.

46. *RHINOPRORA EURYMESA* sp. n.

19-21 mm.

Face very pale green. Palpus almost $2\frac{1}{2}$; coarsely sprinkled with black except at tip. Vertex whitish. Antenna dark-dotted above. Thorax above pale green. Abdomen slightly elongate; pale, with a slight dark belt on second tergite and with the anal segments suffused with dark-grey. Fore leg blackish, with pale spots at end of tarsal joints; mid tibia and tarsus blackish above, with pale spots at ends of joints and at centre of tibia.

Fore wing pale bluish-green; markings reddish mixed with black; basal patch small, its blackish boundary line nearly vertical; no subbasal band; median area considerably broader than in *palpata* Walk., at costal margin about 4 mm., at hind margin about 3 mm., its proximal line somewhat bent near costa, then straightish, its distal (the postmedian) more

weakly outbent at R^1 and R^3 than in *palpata*, otherwise similar, obsolescent posteriorly, its reddish colouring only developed in anterior part, and even here interrupted by a band of the ground-colour at end in front of the discocellulars; suggestions of a fine white line edging the postmedian distally; subterminal very fine, accompanied proximally by blackish marks in the usual positions, the costal fairly large, a little displaced proximally, the radial pair smaller than in normal *palpata*, the posterior ones slight; area between subterminal and termen suffused with red; terminal line black with minute green dots at veins; fringe in proximal half reddish, with a pale basal line and dark spots opposite the veins, in distal half pale greenish, with the dark spots fainter than in proximal. Hind wing distally whitish with very faint indications of postmedial line and with an ill-defined grey subterminal band; terminal line weak; fringe weakly spotted.

Fore wing beneath glossy brown-grey, paler than in *palpata*, somewhat similarly marked but without cell-dot. Hind wing nearly as above.

There is an unnamed ♂ in Tring Mus. from Mt. Kinabalu and I have recently seen a ♀ from Pahang "Cameron Highlands," 4800 feet, 13th June, 1923 (H. M. Pendlebury), in Coll. Fed. Malay States Mus. A worn ♀ in Coll. Tring Mus., from Arjuno, Java, may perhaps be added.

♀ 17--20 mm.

On an average smaller than the ♂. Fore wing brighter green, more sharply marked. Hind wing greyer than in the ♂, more strongly marked, with one or two additional lines proximally, most manifest beneath.

Mt. Murud, 6000--6500 feet, November, Type; 1 ♂ and 2 ♀ from the same locality. Mt. Poi, 5200 feet—3 ♂, 5 ♀.

47. RHINOPRORA CHLOROCAMPSIS sp. n.

♀ 20 mm.

Closely similar to *rubrifusa* Warr. (Nov. Zool., ii, p. 109, as *Gymnodisca*), perhaps a form of the same. Sufficiently distinct in the form and position of the median band. Fore wing with the red-brown subbasal patch larger; median band more distal than in *rubrifusa*, occupying at costa the central one-third of the wing, its distal-side strongly convex (in *rubrifusa* scarcely so), subterminal dark costal spot much weaker, more distal, subterminal line almost obsolete; terminal area with less green admixture (hardly any at apex).

Hind wing above, and both wings beneath, similar with the postmedian line a little more distal and more excurved.

Mt. Murud, 6000-6500 feet, November.

48. RHINOPRORA XANTHOCOMES Prout.

Rhinoprora xanthocomes Prout, Journ. Bomb. Nat. Hist. Soc. (ined.), Burma.

Lio Matu, December—1 ♂.

49. RHINOPRORA PALPATA Walk.

Cidaria palpata Walk., List Lep. Ins., xxv, p. 1404, 1862, South Hindustan.

Mt. Murud, 6000-6500 feet, November—2 ♂.

Both are rather small and weakly marked—perhaps a race, but not in very good condition.

Range not exactly ascertained, certainly very wide in the Indo-Australian region.

50. RHINOPRORA REGULARIS Warr.

Rhinoprora regularis Warr., Nov. Zool., ii, p. 111, 1895, Perak.

Mein Plateau, November—1 ♂.

Only hitherto known from the Malay Peninsula.

51. CALLUGA COSTALIS Moore.

Calluga costalis Moore, Lep. Ceyl., iii, p. 480, pl. 206, fig. 1, 1887, Ceylon.

Mt. Murud, November—24 ♀.

It is curious that amongst such a long series no ♂ was taken. In Indian collections, too, I have noticed the comparative rarity of that sex, which is well figured by Hampson in the "Fauna of British India," Moths (Vol. III, p. 397, fig. 185). The ♀ has only three spurs on the hind tibia; thus neither sex conforms to *Chloroclystis*, in which Hampson has merged it.

52. CHLOROCLYSTIS MODESTA Warr.

Calluga modesta Warr., Proc. Zool. Soc. Lond., 1893, p. 383, Darjeeling.

Mt. Murud, October--November—4 ♀.

The ♀ of this species is not well known and my reference to the present specimens here is somewhat doubtful.

53. CHLOROCLYSTIS SEMIScripta Warr.

Chloroclystis semiscripta Warr., Nov. Zool., xiii, p. 115, 1906, Angabunga River, British New Guinea.

Mt. Poi, 5200 feet—1 ♂.

Only yet recorded from New Guinea, but I have seen a few Malayan specimens in different collections. Nearly related to the following.

54. CHLOROCLYSTIS RUBROVIRIDIS Warr.

Gymnopera rubroviridis Warr., Nov. Zool., iii, p. 107, 1896, Khasia Hills.

Mt. Murud, 6000--6500 feet, November—2 ♀, and one without exact date.

55. CHLOROCLYSTIS OBTURGESCENS sp. n.

♂ 25 mm.

Face and palpus greenish-grey; palpus over $1\frac{1}{2}$. Body pale greenish-grey, somewhat mixed with dirty whitish.

Fore wing broad, costa strongly arched, termen gently curved, moderately oblique; white, shaded in parts of costal and median areas with dirty olive-greenish and rippled with zigzag olive-greenish lines; an indefinite grey shade indicating the position of the darkest androconial patch of underside; subbasal line from costa at nearly 3 mm. moderately curved; antemedial line moderately curved and slightly crenulate, mixed with black; some pinkish and a few black scales in median area; postmedian line anteriorly thick and mixed with black, projecting an acute tooth outward at R^1 , then very indistinct, crenulate, inbent at fold; the white band beyond with a fine bisecting line at one-third of its width; rather large olive-greenish admarginal spots on veins; terminal line fine, olive-green interrupted at veins. Hind wing rather small, amygdaliform, without fringe and almost covered with androconial scaling; dirty olive-brownish, in proximal half mixed with dark grey.

Fore wing beneath partly clothed with androconial scaling, the strongest being a large, dark olive-grey patch behind the cell and the proximal end of M^2 ; the rest of the wing paler olive-brownish. Hind wing beneath pale olive-grey or olive-brownish.

♀ 22--25 mm.

Very similar to that of *rubroviridis* Warr. but less bright, subbasal line of fore wing more curved, median area shaped as in the ♂, with more black proximally than in *rubroviridis*, the hind wing rather paler than in that species, with the markings perhaps rather more proximal.

Mt. Murud, 6000--6500 feet, October, type ♂; November—3 ♀.

Appears intermediate towards "*Chloroplintha*" *velutina* Warr.

56. *ZIRIDAVA XYLINARIA* Walk.

Ziridava xylinaria Walk., List Lep. Ins., xxvi, p. 1550, 1862, Sarawak.

Mt. Murud, November—1 ♂.

Widely distributed from Ceylon and India to New Guinea and Queensland and not very variable.

57. *GONIOPTEROLOBA BICONJUNCTA* sp. n.

♂ 18 mm.

Closely akin to *conjuncta* Warr., Nov. Zool., iv, p. 230, pl. v, fig. 2, Mindoro. Rather smaller and paler. Antennal pectination apparently rather less long. Abdomen with large black dorsal spots.

Fore wing with rather more black marking, in particular with the two bars which form the median band conjoined not only at fold but again at hind margin. Hind wing with the terminal excision between the radials appreciably deeper.

Mt. Murud, 6500 feet, November.

58. *GYMNOSCELIS FASCIATA* Hmps.

Eupithecia fasciata Hmps. Ill. Het., viii, p. 118, pl. clii, f. 22, 1891, Nilgiris.

Mt. Poi, 5200 feet—1 ♂, 1 ♀.

Unless there are two close allies with similar ♂ leg-structure (fore-tibia with a large triangular hairy swelling) the post-median line in this species must be usually variable in degree of angulation. Known to me from the Khasias and the Malay Peninsula.

59. *TRIPTERIDIA SUBCOMOSA* Warr.

Tripteridae subcomosa Warr., Nov. Zool., xiv, p. 161, 1907, Brit. New Guinea.

Mt. Poi, 5200 feet—1 ♂.

Rather darker than the New Guinea form (probably racial).

60. BRABIRA EMERITA sp. n.

♂ 28--34 mm.

Head and body concolorous with wings; collar slightly brighter; abdomen with irregular, interrupted black longitudinal markings subdorsally and laterally, stronger anteriorly than posteriorly. Fore leg partly blackened, with pale rings at middle and end of tibia and ends of tarsal joints. Palpus almost 2. Antennal pectinations very slender and twisted.

Fore wing rather broad, costa slightly arched, termen long, very oblique, slightly curved; light brown, nearly as in *atkinsonii* Moore, or slightly less ochreous; four black-grey spots on costa, the first two rather near together, with ill-defined grey lines or shades (subbasal and intermediate) arising from them, the third and fourth strong, at (just inside) the boundaries of the median area; antemedian and postmedian lines grey, irregularly dentate, the antemedian oblique but less so than termen, the postmedian strongly oblique outward from costal spot to cellule 6, nearly parallel with antemedian to cellule 3, then parallel with termen; a slight reddish-grey suffusion in median area; cell-dot rather large, slightly elongate; a vague median line outbent beyond it; area beyond postmedian palest on the veins, traversed by a faint dentate line; subterminal much as in *atkinsonii*, placed on an ill-defined dark terminal shade; terminal line blackish, interrupted at the veins and somewhat midway between; fringe almost unmarked. Hind wing much paler, with a cloudy band of light-brown just proximal to middle and two broad dentate lines (or narrow bands) beyond, the latter close to termen at both ends.

Fore wing beneath with cell-spot; postmedian line and one corresponding to second of upperside strong, the other markings weak; hind wing less pale than above, the bands weak.

Mt. Murud, 6500 feet, November (type), (paratype, smaller and rather darker than type).

♀ 34 mm.

Fore wing much paler and weaker-marked than in the ♂, but otherwise similar, though the subterminal line looks rather more deeply dentate.

Mt. Poi, 4300 feet, allotype.

61. *PTHONOLOBA LEPTOMITA* sp. n.

♀ 40 mm.

Palpus with second joint longer than diameter of eye, the scales projecting somewhat less than in the type species and *benguetana* Schultze (Philipp. Journ. Sci., v, p. 165, t. 1, f. 5). Head and body pale yellowish-green, the thorax above fuller green. Antenna ochreous. Fore and middle legs with some dark markings. Abdomen fairly robust for this group; some faint, cloudy subdorsal spots.

Fore wing light yellowish-olive, intersected by creamy-white (in places pale yellow) lines; a moderate black cell-mark; some fuscous irroration darkening the costal end of most of the green bands, the first three bands between M^2 and SM^2 , the proximal subterminal region between the radials and behind M^2 , etc.; the principal white lines subbasal, antemedian and postmedian; subbasal incurved behind cell, very oblique outward to hind margin; antemedian almost interrupted at SC, then slightly wavy, very slightly incurved between cell-fold and SM^2 ; postmedian interrupted behind SC^5 , reappearing slightly more distally at R^1 , slightly wavy, forming two outward lunules between R^3 and M^2 (the posterior very shallow), behind M^2 perpendicular, at hind margin oblique outward; subterminal line extremely fine, rather deeply indented at SC^5 , R^3 and M^2 , running out to termen in front of SM^2 ; the other lines also very slender, much interrupted, chiefly reduced to vein-dots. Hind wing very pale yellowish; a cell-dot, an undulate postmedian line and a distal band, all as in *benguetana* but very much fainter, the two former greyish, the band more olive.

Both wings beneath pale yellow-green (or green-yellow) the fore wing with the markings weak, the hind wing with cell-dot and line slightly stronger than above.

Mt. Murud, 7200 feet (summit) November.

62. *SAURIS NIGRIFRONS* Warr.

Sauris nigrifrons Warr., Nov. Zool., xiv, p. 163, 1907, British New Guinea.

Mt. Poi, 4500 feet—1 ♀.

Not mentioned in literature since the original publication, but I have seen a few examples from the mountains of Borneo and the Malay Peninsula.

63. SAURIS DENIGRATA, Warr.

Remodes ? denigrata Warr., Nov. Zool., iv, p. 66, 1897, Perak.

Mt. Poi, 4350 feet—1 ♀.

The few specimens yet known to me, from Perak, Gunong Ijau and Bidi, Sarawak, are all ♀.

64. SAURIS USTA, Warr.

Holorista usta Warr., Nov. Zool., ii, p. 106, 1895, ♂, (nec ♀), Gunong Ijau, Malay Peninsula.

Mt. Murud, 6000-6500 feet, October--November—3 ♀.

Only definitely known from a few Malayan localities. Warren's "type ♀" was a ♂ of the section or genus *Steirophora* (!), probably *fasciata* Moore, but Tring Museum possesses both sexes from the type locality, not differing except in the sexual characters.

65. SAURIS SEMINIGRA, Warr. subsp. (?).

Holorista seminigra Warr., Nov. Zool., x, p. 383, 1903, British New Guinea.

Mount Poi, 4350 feet—1 ♂.

Rather damaged but apparently very close to a MS Buru race of this species in coll. Joicey.

66. SAURIS CERAMICA Roths.

Sauris ceramica Roths., Nov. Zool., xxii, p. 219, 1915, Central Ceram.

Mt. Poi, 5200 feet—1 ♂.

Described from a single ♀, but the ♂ is awaiting publication in the reports of the Pratt Collections made for J. J. Joicey, Esq. It would be premature to decide whether the Borneo example differs racially.

SUBFAM. GEOMETRINAE.

67. OURAPTERYX INCAUDATA Warr.

Ourapteryx incaudata Warr., Nov. Zool., iv, p. 75, 1897, Kinabalu.

Mt. Poi—1 ♂, 2 ♀; a pair at 3500 feet altitude, the other ♀ at 4700 feet.

The few specimens yet known are all from Borneo.

68. AUZEODES CHALYBEATA, Walk.

Decetia chalybeata Walk., List Lep. Ins., xxxv, p. 1558, 1866, Sumatra.

Mt. Dulit, 3000 feet—1 ♂.

Range. E. Pegu, Malay Peninsula, Borneo, Sumatra.

69. VISITARA BRUNNEIPLAGA Swinh.

Visitara brunneiplaga Swinh., Trans. Ent. Soc. Lond., 1902, p. 621, Sumatra.

Mt. Dulit, 200 feet—1 ♀.

Known from Borneo and Sumatra and perhaps the Philippines.

70. MYRTETA OCERNARIA. Swinh.

Microniodes ocernaria Swinh., Ann. Mag. Nat. Hist. (6), xii, p. 152, 1893, Khasia Hills.

Mt. Murud, 6500 feet, November—2 ♀.

A large form, remarkably like (subsp. ?) *similaria* Swinh. (Ann. Mag. Nat. Hist. (8), xvi, p. 183), except for the absence of the apical patch on fore wing beneath. I believe the species is widely distributed in the Indo-Australian region but the range and nature of variation has not yet been worked out. I have seen *similaria* from Sumatra (loc. typ.), Borneo and Pahang.

71. TASTA SECTINOTA Hmps.

Tasta sectinota Hmps., Faun. Ind. Moths, iii, p. 154, 1895, E. Pegu.

Lio Matu, December—1 ♀.

Apparently an extremely rare though moderately distributed species. I have seen single specimens from Sikkim, Java, and Sumatra; the present is the first known to me from Borneo.

72. LEUCETAERA LUCIFERATA, Walk.

Noreia luciferata Walk., List Lep. Ins., xxiv, p. 1093, 1862, Sarawak.

Mt. Murud, 6000 feet and upwards, November—1 ♂, 2 ♀;
Mt. Dulit, 3000 feet—1 ♀.

Range. Andamans, Malay Peninsula, Sumatra, Borneo.

73. BAPTA JUTA sp. n.

♂ 30--32 mm.

Face and palpus very dark reddish-brown, palpus with 2nd joint slender, appressed-scaled. Vertex, thorax and abdomen white. Fore and mid legs more or less infuscated.

Fore wing broad, termen straightish, not very oblique; SC¹ free, SC² stalked beyond SC³; glistening white irrorated with grey (less densely than in *platyleucata* Walk.); costal edge bright ochreous; cell-dot black, strong; lines grey, shadowy, thick, obsolete costally; antemedian (here median) almost

perpendicular from cell-dot to hind margin; postmedian almost straight from SC^5 to hind margin, parallel with termen; a less irrorated band beyond this extending about halfway to termen; fringe white proximally, brown-grey distally. Hind wing with cell-dot smaller, though well-developed; median line wanting, postmedian continued, curved parallel with termen; outer area and fringe as on fore wing.

Underside white; fore wing with costal edge ochreous, cell-dot faintly showing through.

Mt. Murud, 6000--6500 feet, November—5 ♂, including the type.

Probably nearest to *platyleucata* Walk.

74. PLUTODES CYCLARIA Guen.

Plutodes cyclaria Guen., Spec. Gén. Lép., x, p. 118, pl. 20, f. 3, 1858, Sarawak.

Mt. Dulit, 3000 feet—1 ♀.

A rather variable and fairly common species in the Malayan subregion.

75. PERATOPHYGA VENETIA Swinh.

Peratophyga venetia Swinh., Ann. Mag. Nat. Hist. (7), ix, p. 416, 1902, Perak.

Lio Matu, December—2 ♂.

Inhabits Borneo and the Malay Peninsula, probably representing *hyalinata* Koll. (= *aerata* Moore) of North India.

76. PERATOPHYGA TRIGONATA, Walk.

Acidalia (?) *trigonata* Walk., List Lep. Ins., xxiii, p. 774, 1861, Sarawak.

Mt. Murud, November—1 ♂.

Scarcely known except from Sarawak and Singapore.

77. PERATOPHYGA SPOLODESMA Prout, MS.

Bakong—1 ♀.

A damaged specimen wanting head and abdomen. The species from Bidi, Sarawak, has long been awaiting publication, together with many others in Coll. Joicey.

78. PERATOPHYGA XANTHYALA, Hmps.

Zamarada xanthyla Hmps., Faun. Ind. Moths, iv, p. 553, 1896, Sikkim.

Mt. Poi, 5000 feet—1 ♂.

Hampson placed this species as *Zamarada* evidently on account of its coloration, without looking at the structure; R^1 and R^2 of the fore wing are well stalked and only the ♂ has the antenna pectinate, i.e., it is an extreme development of the *trigonata* section of *Peratophyga*; in either genus it would be aberrant in the bent termen of hind wing—not mentioned by Hampson.

79. *CASSYMA QUADRINATA* Guen.

Cassyma quadrinata Guen., Spec. Gén. Lép., x, p. 18, 1858, Borneo.

Mt. Poi, 4350 feet—1 ♀.

Known also from Selangor.

80. *CHIASMIA MINUTA* Warr.

Chiasmia minuta Warr., Nov. Zool., xii, p. 433, 1905, Borneo.

Mt. Murud, November—1 ♀.

Only known from Tonkin, Sumatra and Borneo.

81. *SYNEGIA OCELLATA*, Warr. (?)

Syntaracta ocellata Warr., Nov. Zool., i, p. 408, 1894, Gunong Ijau.

Mt. Murud, 6500 feet, November—1 ♀.

Provisionally regarded as a large, very reddish, heavily marked form of this little-known species, but the characteristic "ocellus" of cellule 3 of the hind wing is reduced—encroached upon by the dark clouding.

82. *SYNEGIA CAMPTOGRAMMARIA* Guen.

Synegia camptogrammaria Guen., Spec. Gén. Lép., ix, p. 420, 1858, Sarawak.

Mt. Murud, 6000--6500 feet, October—1 ♀; November—2 ♀, without indication of altitude.

There may be two or three very closely allied species confused under this name, but as they have about the same geographical distribution—N. India, Malay Peninsula, Borneo, etc.—it is possible that the variations are only individual. The genus has never been systematically dealt with.

83. *BORBACHA PARDARIA* Guen.

Synegia pardaria Guen., Spec. Gén. Lép., ix, p. 420, 1858, Borneo.

Mt. Murud, 6000--6500 feet—1 ♀.

Range. Ceylon, India, Malay Peninsula, Borneo, Sumatra, Java, Lombok, Sambawa.

84. HYPOCHROSIS LYCORARIA Guen.

Hypochrosis lycoraria Guen., Spec. Gén. Léop., x, p. 538, 1858, Borneo.

Hypochrosis jasminaria Guen., loc. cit., East Indies.

Lio Matu, December—1 ♂; Bakong—1 ♂.

Both the examples belong to the form *jasminaria*. The species is fairly common in the Malay Peninsula, Sumatra and Borneo. Tams records it from Siam.

85. HYPOCHROSIS CENTRARIA Snell.

Hypochrosis centraria Snell. in Veth, Midden--Sumatra, iv, 1 (2), p. 57, pl. iv, f. 13, 1880, Sumatra.

Hypochrosis mimaria Swinh., Ann. Mag. Nat. Hist. (8), iii, p. 92, 1909, Sumatra.

Mt. Penrissen, 2000 feet—1 ♂.

Hitherto only from Sumatra.

86. HYPOCHROSIS XEROPHYLLA sp. n.

♂ 37 mm.

Face slightly tufted; deep brown, tinged with rufous, narrowly pale above. Palpus $1\frac{3}{4}$; ochreous, mixed with purple-red, above darkened towards end of 2nd joint, the minute decumbent 3rd joint blackish. Vertex and antenna whitish flesh-colour; pectinations about 6. Thorax above whitish-fleshy, beneath mixed with ochreous and purplish; abdomen above rather paler, beneath varied with ochreous and purplish and with some black scales. Legs spotted with purple and blackish, the last four joints of fore tarsus mostly blacker, those of mid tarsus also darkened.

Fore wing slightly narrower than in *mixticolor* Prout (Seitz Macrolep iv, p. 337); SC^1 (out of SC^2) anastomosing with C, SC^{3+4} separating close to apex or perhaps coincident, SC^5 very long stalked, R^2 not much before middle of DC; whitish-buff with a fleshy tinge and with coarse black-grey irroration or minute strigulation; ill-defined browner (somewhat ochreous) shades at base, antemedially (bent in cell), medially (broadest at costa, then enclosing a large black, pale rimmed cell-dot), proximally to the postmedian and at apex of costa; no definite lines except the postmedian which runs obliquely and almost straight (or extremely gently incurved) from towards two-thirds of hind margin to R^2 (about 3 mm. from termen), in front of which it is acutely angled and weakened and runs obliquely inward to costa a little proximal to two-thirds; terminal edge ochreous; fringe deep red-brown. Hind wing rather narrower

than in *mixticolor*; concolorous with fore wing or slightly paler (with less shadings); cell-dot rather less large, postmedian straightish, close beyond it, blacker than on fore wing but obsolete costally, accompanied proximally towards abdominal margin by a narrow shade mixed with ochreous, purplish and blackish; a small black subterminal spot in cellule 3, nearer to postmedian than to termen; termen and fringe as on fore wing.

Underside more tinged with ochreous and (especially on fore wing) much more mottled with dull purple; markings much as above; fore wing also with a small terminal patch of purple close to tornus, hind wing with a narrow apical one reaching (tapering to) radical fold.

Mt. Murud, 6000--6500 feet, November.

Nearest to *mixticolor* Prout, which shows similar anomalies in venation compared with typical *Hypochrosis*; both have also slightly the texture and coloration of *Phalaena*. Possibly they will require a new genus.

87. *LUXIARIA AMASA fulvifascia* Warr.

Luciaria fulvifuscia Warr., Nov. Zool., i, p. 440, 1894, Sumatra.

Pah Trap, November—1 ♂.

It is not certain whether this race (Sumatra, Perak, Borneo) is definitely differentiable from *amasa fasciosa* Moore (Lep. Coll. Atk., p. 254) from N. India, but as the Malayan specimens seem always warmly coloured and are already provided with a name it is clearly better to conserve it than to make any premature alteration. Name-typical *amasa* Butl. (Ann. Mag. Nat. Hist. (5), i., p. 405) is from Japan and China.

88. *LUXIARIA SUBRASATA* Walk.

Acidalia subrasata Walk., List Lep. Ins., xxiii, p. 773, 1861, Sarawak.

Pah Trap, November—1 ♂; Mt. Murud, November—4 ♀.

Name-typical forms occur in the Malay Peninsula and (or almost) in N. India, apparent races in the Moluccas and in New Guinea.

89. *LUXIARIA VERSIFORMIS* Prout.

Luciaria versiformis Prout, Nov. Zool., xxxii, (ined.), Malay Peninsula.

Mt. Murud, 6000--6500 feet, October—1 ♂; Mt. Penrissen, 3500 feet—1 ♂.

The ♀ will probably be difficult to distinguish from that of *subrasata* and it is possible that some of the ♀ referred there (*supra*) really belong here.

90. LUXIARIA ACUTARIA Snell.

Boarmia acutaria Snell., Tijds. Ent., xx, p. 75, t. vi, 1877, Sumatra.

Mt Poi, 5000 feet—1 ♀.

As noted above, some of the ♀ in this genus are not easy to place, but I believe the present form (which I have also seen from Perak) is referable to Snellen's species.

91. HYPOSIDRA TALACA Walk.

Lagyra talaca Walk., List Lep. Ins., xx, p. 59, 1860, Celebes.

Lio Matu, December—1 ♂.

Very widely distributed in the Indo-Australian region.

92. PETELIA IMMACULATA Hmps.

Petelia immaculata Hmps., Ill. Het., ix, p. 140, pl. clxviii, fig. 6, 12, 1893, Ceylon.

Mt. Murud—1 ♂, 2 ♀; Mt. Poi, 5000 feet—1 ♂.

Range. Ceylon, Nilgiris, N. India, Burma, Tonkin, Penang, Borneo.

93. FASCELLINA PLAGIATA Walk.

Geometra plagiata Walk., List Lep. Ins., xxxv, p. 1601, 1866, Hindustan.

Mt. Murud, 6000-6500 feet, October—1 ♂.

Commonest in N. India but also known from China, the Malay Peninsula and Sumatra.

94. POLYSCIA VIRIDISPURCA sp. n.

♂ 36 mm.

Face reddish-brown, upper part with olive-grey suffusion. Palpus more ochreous, on outer side somewhat suffused with olive-grey, terminal joint darkened. Thorax concolorous with fore wing; abdomen less yellowish than hind wing, on posterior segments above strongly suffused with pink. Fore and middle legs (as in the other species) longitudinally lined with black. Wings shaped as in *ochrilinea* Warr., or slightly narrower.

Fore wing Naples-yellow with minute, irregularly arranged green strigulae, which are dense in proximal area (especially anteriorly), sparse in median area (especially posteriorly), moderate in terminal area; costal edge brighter yellow, a subcostal streak pale green; markings as in *ochrilinea*, but with the antemedian greener, appreciably less oblique, the postmedian brighter, anteriorly curving into a crimson spot at

SC⁵, which is connected with a smaller apical one; two indistinct roundish grey-spots beyond the postmedian, in middle and posteriorly (probably inconstant); fringe slightly darkened at tip, reddened at the apical spots. Hind wing with termen nearly straight; less strigulate than fore wing (chiefly at base and apex); postmedian line continued as antemedian (from DC² to hind margin just proximally to middle); traces of the outer line of underside, especially at costa.

Underside bright yellow. Fore wing with posterior margin (except at tornus) white, the rest of the wing with strong, dark purple-grey strigulae; postmedian line purple-grey, thickening into a brighter spot between M² and fold. Hind wing with the strigulae sparse, except proximally (especially along costal margin); the line from DC² to hind margin purplish; a redder postmedian half-line between costa and M², a little excurved anteriorly, intent behind R¹ but becoming weak and interrupted; some coarse, partly confluent rosy irroration terminally, culminating in a dense, uninterrupted terminal line.

Mt. Penrissen, 4400 feet.

95. *DALIMA MJOBERGI* sp. n.

♂ 64 mm.

Closely like a large *calamina* Butl. (Ann. Mag. Nat. Hist. (5), vi, p. 121), except in shape of hind wing. Ground-colour rather deeper.

Fore wing with markings stronger than in *calamina*; antemedian scarcely angled in cell; median costal spot vertical, not oblique outward. Hind wing produced to a double tail at SC²--R¹, about 3 mm. long at the former, rudimentary in the latter (about as in the much larger, darker *nubilata* Hmps.); on this tail a large black spot; terminal line in the cellule on either side of it strongly black; cell-dot rather large.

Mt. Murud, 6000--6500 feet, October.

96. *XANDRAMES LATIFERARIA curvistriga* Warr.

Xandrames latistriga Warr., Nov. Zool., i, p. 431, 1894, Khasia Hills.

Mt. Poi, 4500 feet—1 ♂.

It is possible that the Borneo-Sumatra race may prove separable from the Indian. Name-typical *latiferaria* Walk. (List Lep. Ins., xxi, p. 445) was from "North China" (? Shanghai district).

97. OPTHALMODES EXEMPTARIA Walk. (?)

Ophthalmodes exemptaria Walk., List Lep. Ins., xxi, p. 447, 1860, Sarawak.

Mt. Poi, 2000 feet—1 ♀.

According to Swinhoe (Cat. Lep. Het. Oxf. Mus., ii, p. 284) the Borneo *Ophthalmodes* are referable to a single very variable species. The question remains doubtful, pending an analysis of more extensive material. Mr. Joicey has (apart from *clararia* Walk., which seems distinct) six forms from Borneo (four from Bidi, Sarawak) in eight specimens and the present example does not quite agree with any.

98. ECTROPIS IDAEOIDES MOORE.

Cleora idaeoides Moore, Lep. Coll. Ath., p. 239, 1888, Darjeeling,
Myrioblephara albipuncta Warr., Proc. Zool. Soc. Lond., 1893, p. 428, Sikkim.

Mt. Murud, October--November—2 ♀.

Probably a race, larger (especially the earlier specimen) than Indian examples.

99. ECTROPIS SIMPLARIA Swinh.

Ectropis simplaria Swinh., Trans. Ent. Soc. Lond., 1894, p. 221, Khasia Hills.

Tutau River, October—1 ♀; Mt. Murud, November—1 ♀.

I believe this species, possibly in distinguishable races will prove to inhabit a considerable part of the Indo-Australian region. A form from Ceram has been described by Rothschild (Nov. Zool., xxii, p. 216, 1915), as *boarmioides*. The differently shaped postmedian lines disproves Hampson's (Faun. Ind. Moths, iii, p. 259) sinking to the preceding.

100. ECTROPIS LONGISCAPIA sp. n.

♂ 40 mm.

Extremely like *bhurmitra* Walk., List Lep. Ins., xxi, p. 381, Ceylon. Antennal ciliation slightly longer. Hind tibia without hair-pencil. Abdomen without basal spine; second tergite rather warmly coloured, third with pair of dark anterior spots rather well-developed.

Fore wing with the stalk of $SC^{1.2}$ arising well down the stalk of $SC^{3.4.5}$ in all three examples (in very rare aberrations of *bhurmitra* connate or just stalked, usually well separate); rather brighter and smoother-looking than *bhurmitra*, the irroration less dense, the markings standing out more

prominently; cell-mark better developed, rather elongate; postmedian rather less incurved behind M^2 , the thick ochreous-brown line distally to it better developed. Hind wing similarly with the markings well expressed; antemedian line rather sharp; cell-mark conspicuous. Underside almost entirely unmarked.

Mt. Poi, 4350--4500 feet—1 ♂, type and another ♂.

Also known to me from Kedah Peak, Malay Peninsula.

101. *ECTROPIS (RUTTELERONA) LITHINA* Warr.

Paralcis lithina Warr., Nov. Zool., x, p. 398, 1903, British New Guinea.

Mt. Poi, 4350 feet—1 ♂.

As the Borneo subspecies is at present "in the press" and will appear shortly in the "Novitates Zoologicae" I will not complicate the bibliographer's work by referring to it by name here.

102. *ECTROPIS TRISTIS* Butl.

Abaciscus tristis Butl., Ill. Het., vii, p. 102, pl. cxxxv, f. 18, 1889, N.W. India.

Mt. Poi, 4350 feet—1 ♂.

An aberration with the white markings reduced. The forms from N.W. India and Assam (whence alone I have hitherto known it) show this to be a variable species.

103. *ECTROPIS PICTA* Warr.

Myrioblephara picta Warr., Nov. Zool., iii, p. 404, 1896, Java.

Mt. Poi, 4350--4500 feet—2 ♀.

Both appear more heavily marked—especially in respect of the distal area of hind wing above and beneath—than Warren's Javan type. Perhaps racial.

104. *CLEORA DETERMINATA* Walk.

Boarmia determinata Walk., List Lep. Ins., xxi, p. 384, 1860, Sarawak.

Mt. Poi, 4300--5000 feet—5 ♂.

Inhabits the Malay Peninsula, Sumatra, and Borneo. I formerly considered Walker's suggestion that this might be a subspecies of the Indian *alienaria* Walk. to be well founded, but as I have recently discovered that there are other claimants in Malaya, which I have not yet fully worked out, I continue to quote *determinata* as a species.

105. *CLEORA MJÖBERGI* sp. n.

♂ 40--48 mm.

Nearly related to the preceding. Palpus with third joint more heavily clavate. Antennal pectinations more lax, in all the examples more or less curling about the shaft. Hind tibial hair-pencil mixed with bright ochreous (in *determinata* grey and blackish).

Fore wing with termen appreciably less oblique; antemedian line more acutely angled in cell; median area rarely conspicuously paler than the rest; the sinuous median line generally well-developed; postmedian much more gently and regularly excurved anteriorly than in *determinata*, intermediate towards that of *inflexaria* Snell. Hind wing less rounded apically, this appearing rather more elongate; proximal whitish area nearly always sharply contrasted with the median area, the dividing line (median) nearly always more proximally placed and better developed than in *determinata*; terminal area less mottled with white.

Fore wing beneath with cell-spot much less large than in *determinata*; both wings with the dark subterminal band much less broad, less black, the paler parts (except apex of fore wing) less white, more suffused, than in that species.

An aberration (2 ♂) has the median shade thickened, looking much less sinuous on the fore wing. Apart from this form, the species is also moderately variable in depth of colouring, etc.

♀ 46 mm. Similarly marked to the described ♂--ab., but whiter.

Mt. Murud, 6000--6500 feet, November—22 ♂, 1 ♀, including type ♂ and allotype ♀.

106. *CLEORA INFLEXARIA* Snell.

Boarmia inflexaria Snell., Tijd. Ent., xxiv, p. 72, pl. 8, f. 2, 1881, Celebes.

Mt. Poi, 200 feet—1 ♂.

Widely distributed through the Indo-Australian region.

107. *CLEORA PROPULSARIA* Walk.

Boarmia propulsaria Walk., List Lep. Ins., xxi, p. 385, 1860, Sarawak.

Mt. Penrissen, 2000 feet—1 ♂; Mt. Poi, 5000 feet—1 ♂; Mt. Dulit, 3000 feet—1 ♂.

A common and widely distributed Indo-Malayan species. The Mt. Dulit example is large and well-marked.

108. *CLEORA PERIPHRACTA* sp. n.

♂ 39 mm.

Very like a large *colorifera* Prout (Nov. Zool., xxiii., p. 52), of which, in spite of the apparent structural differences (mostly unverifiable without dissection) it is hard to believe it may not be a remarkable form. Rather larger. Face predominantly white. Palpus with third joint perhaps rather longer (more fully exposed) more drooping. Hind tibia perhaps more heavily dilated, the black hair-pencil very strong. Both wings darker, less ochreous, above and beneath. Fore wing with secondary fovea (present in both species in front of submedian fold) broader; stronger dark interneural marks from postmedian to subterminal; dark clouding (apparently variable) between M (—M²) and SM². Hind wing with termen rather more strongly crenulate than in *colorifera*; costal margin rather more arched proximally.

Mt. Penrissen, 3500 feet.

There are also less dark examples in Coll. Tring Mus. from Kinabalu (1 ♂, 1 ♀) and Gunong Ijau (1 ♀). Differs from *variegata* Moore in the considerably longer pectinations, more elongate hind wing, less bright and varied coloration, deeply lunulate-dentate subterminal of hind wing between R³ and tornus, heavy dark borders beneath, etc. In all the *colorifera* and *periphRACTA* yet known to me SC¹ and SC² arise from the cell well apart, while in *variegata* they are nearly always stalked, though usually very shortly.

109. *CLEORA PRAEVARIEGATA* sp. n.

♂ 34 mm.

Group of *variegata* Moore. Palpus with terminal joint rather longer, more drooping. Antennal pectinations much longer, the longest fully 1.5 mm.

Fore wing with SC¹ shortly stalked, sometimes anastomosing with C; fovea scarcely so large as in *variegata*; wing even more variegated, the ground-colour nearly white, strongly suffused with ochre yellow about both folds, the pale subterminal spot in the type more orange, the blackish cloudings and median shade stronger; some blackish hind marginal shading between antemedian and median; median curved outside cell-spot, not angled; postmedian less excurved between SC⁵ and R²; subterminal barely indented at fold, expanding into a marked spot at tornus; terminal pale mark

in cellule 3 and on fringe more developed. Hind wing with costal margin less expanded costally than in *variegata*; costal area above less white; cell-spot larger; terminal violet-grey shade strong, obliterating the anterior half of subterminal line.

Underside more heavily marked than in *variegata*.

♀ 38 mm.

Darker than the ♂, the median area of the fore wing almost entirely dark, the borders of hind wing and underside broad and heavy.

Mt. Murud, November (type ♂); 6000-6500 feet (allotype ♀). Mt. Poi, 5200 feet—2 ♂, rather larger and still more heavily marked with the median shade slightly more bent. Mt. Penrissen, 4400 feet—1 ♂, slightly intermediate, nearer to the type.

110. *CLEORA AEGLOPHANES* sp. n.

♂ 40 mm.

Very close to the preceding, of which it may prove a form. Larger and brighter, the body and wings with more of the orange admixture.

Fore wing with apex and termen slightly more rounded; the ochreous suffusion at the folds brighter; distal dark borders more relieved with orange at apex and (in proximal part) at both ends; median and postmedian lines slightly more incurved posteriorly. Hind wing slightly ampler than in *praevariegata*; proximal dark markings not nearly reaching costa; cell-mark narrower; terminal band, except anteriorly, much mixed with orange.

Underside nearly as in *praevariegata*, the hind wing more weakly marked anteriorly and with rather smaller cell-spot.

Mt. Murud, 6000-6500 feet, October; from Kinabalu, a ♂ in Coll. Tring Museum.

111. *CLEORA DERIVATA* sp. n.

♂ 35 mm.

Head light brown, mixed on face and palpus with dusky brown. Palpus $1\frac{1}{2}$, second joint with the spreading scales rather less dense than in most of the allies, terminal joint over one-half second joint, exposed, slightly swollen in middle. Antenna pectinate to about three-fifths, the branches rather slender, the longest nearly 5. Thorax and abdomen above

pale brown, somewhat variegated, the patagia and tegulae predominantly deeper brown and blackish; beneath paler. Hind tibia moderately dilated with hair-pencil; abdominal spine slender.

Fore wing with SC^1 quite shortly stalked with SC^2 , anastomosing moderately with C; fovea not quite so large as in *variegata* Moore, partly scaled above; ground-colour whitish-brown, scarcely showing except in a narrow band proximal to the postmedian line and in the apex, otherwise suffused with Mikado-brown (Ridgway, pl. xxix); markings much as in *versicolor* Prout (Sar. Mus. Journ., ii, p. 181). Hind wing with a tinge of ochre, but much less pronounced than in *versicolor*; postmedian line straighter; a rather ill-defined terminal (in places subterminal) band of grey shading, about 2.5 mm. in width. Underside less ochreous than in *versicolor*, the markings of upperside showing in grey; both wings dark-bordered, the fore wing with clear apical and midterminal spots.

Mt. Murud, 6000--6500 feet, October.

The type of *versicolor* is a ♀ from Mt. Kinabalu. It is just possible, though extremely unlikely, that this much smaller insect is its ♂.

112. BOARMIA COSTARIA Guen.

Boarmia costaria Guen., Spec. Gén. Lép., ix, p. 242, 1858, Sarawak

Lio Matu—1 ♂; Mt. Dulit, 3000 feet—1 ♂.

Range. Borneo, Sumatra, Java.

113. BOARMIA LIOPTILARIA Swinh.

Boarmia lioptilaria Swinh., Fascia. Malay Zool., i, p. 91, 1903, Selangor.

Mt. Murud, November—1 ♂; Mt. Dulit, 3000 feet—1 ♂.

Local in the Malay Peninsula and Sumatra. A race (?) in Assam.

114. BOARMIA SUBDETRACTARIA Prout.

Boarmia detractaria Walk., List Lep. Ins., xxi, p. 385, 1860 (nom. praeocc.), Sarawak.

Boarmia subdetractaria Prout, Nov. Zool., xxx, p. 211, 1923 (Nom. nov.).

Lio Matu, December—1 ♂; Mt. Dulit, 3000 feet—3 ♂.

A rather common Sarawak species, otherwise known to me from the Malay Peninsula and Sumatra.

115. BOARMIA FIMBRIATA Moore.

Cleora fimbriata Moore, Proc. Zool. Soc. Lond., 1867, p. 628, Bengal.

Mt. Murud, November—1 ♂.

Rather brightly coloured above, recalling *squamosa* Warr. (Nov. Zool. iii, p. 131) beneath. *B. fimbriata* as at present understood seems very variable and it is undesirable to erect a subspecies on a single example.

116. BOARMIA MESOTOECHIA sp. n.

♀ 35 mm.

Face with moderately appressed scales; blackish-brown, narrowly pale beneath. Palpus rather short and stout, with minute blunt terminal joint; blackish-brown, paler at tip. Vertex black-brown; occiput pale buff. Body pale buff; wing-tegulae with a dark central spot; abdomen above with weak dark belts which are slightly interrupted by a pale mediodorsal line.

Wings with about the shape of *fimbriata* Moore. Fore wing with $SC^{1,2}$ long-stalked, anastomosing at a point with C, SC^2 connected with $SC^{3,4}$; pale buff, somewhat clouded (especially at the postmedian line) with cinnamon-buff; some dark irroration; dark costal spots at 4, 8 and 11 mm., giving birth to the lines; antemedian marked by a dot on M and a short streak on SM^2 ; median slightly excurved just outside the cell-dot, thickened a little at hind margin; postmedian punctiform, with a spot at SM^2 (reaching hind margin), rather abruptly bent outward to the dot on R^1 , thence rather more oblique inward than termen, the posterior spot, however, rather more distal than the dot on M^2 ; terminal area dark-clouded near apex and tornally; subterminal fairly distinct on the dark shades, slight between, dentate anteriorly, scarcely posteriorly; longitudinal black terminal marks in cellules 4, 5 and 6; terminal line interrupted at the veins; fringe weakly mottled. Hind wing pale at extreme base, thence heavily irrorated to near middle, where a blackish median band nearly touches the feeble postmedian dots; a rather broad cinnamon-buff band beyond, nearly (in middle quite) reaching the subterminal; distal area nearly as on fore wing.

Underside cream-buff; proximal area with strong dark irroration and suffusion; median shade of fore wing almost as broad as on hind wing; straightish, crossing the cell-dot,

posteriorly furcate, its distal branch joining the hinder spot of the postmedian; postmedian as above; terminal bands darker and more solid, especially on fore wing, where only apex and faint traces of subterminal line and of terminal markings between R^3 and M^2 remain pale.

Mt. Murud, November.

In spite of date of capture and similarity of structure, it seems impossible that this can be a ♀ form of the preceding.

117. *BOARMIA CHLOANA* sp. n.

♂, ♀ 33--36 mm.

Face nearly smooth, without cone below. Palpus rather short, heavily scaled above and beneath; terminal joint small and blunt, mostly concealed. Antennal pectinations moderate (the longest about 4), distal one-fifth merely ciliated. Head and thorax tawny-olive, no doubt greener when fresh emerged; abdomen rather greyer, with a slight, pale basal crest; body beneath whitish. Abdomen of ♂ with strong lateral and anal tufts, much as in *Polylophodes triangularia* Warr. (Nov. Zool., iii, p. 406). Fore and middle legs darkened above, with pale spots at ends of joints.

Fore wing rather elongate, termen smooth, curved, strongly oblique; SC^{1+2} coincident, free; fovea present; light yellowish-olive, with small black costal spots at origin of lines; an incomplete (costal) band close to base; a moderately broad vinaceous-cinnamon, black-irrorated band on either side of median area, the proximal slightly broader and stronger; lines blackish; antemedian from costa at about 5 mm., rather variably excurved in cell, angled inward at fold; cell-mark more or less elongate, narrow; median just beyond it, angled outward in cellule 5, weak posteriorly; postmedian just proximal to two-thirds, angled outward in cellule 5, oblique inward to M^1 , here and on M^2 with black spots, weaker posteriorly, gently incurved at fold; subterminal white, dentate, with deeper proximal tooth on R^3 , posteriorly running to tornus; a vinaceous-cinnamon, black-mixed terminal spot at the radials; terminal black dots sharp, triangular; fringe pale, distally almost white, proximally with dark spots opposite the veins. Hind wing with apex round-prominent, termen wavy and sinuous, straightish or almost convex anteriorly, weakly convex posteriorly; proximal half whitish, with grey median and postmedian lines, the former thickened at abdominal margin,

the latter slightly sinuous; cell-mark touching the postmedian. a broad violet-grey band between postmedian and subterminal; abdominal margin, tornus and termen concolorous with fore wing; an elongate black tornal spot bounding the subterminal line proximally; terminal spots flatter, connected by a dark thread.

Both wings beneath much as fore wing above, the grey shades more smoky, almost or quite reaching termen; fore wing also suffused in and just beyond cell, the costal margin remaining tawny-olive, the hind margin white; fringes more weakly spotted than above.

Mt. Murud, 6000-6500 feet, November—4 ♂, 2 ♀.

Probably near *triangularia* Warr., the ♂ much less eccentric in shape and with the specialized scaling beneath hind wing. These species, together with *Ectropis picta* Warr., *Necyopa flatipennata* Walk. and a few others may well form a separate biological group with very unstable ♂ characters, perhaps near *Diplurodes*.

118. HEMEROPHILA DELINEATA Walk.

Boarmia delineata Walk., List Lep. Ins., xxi, p. 387, ♀, 1860, Sarawak.

Mt. Poi, 4400-5000 feet—3 ♂.

If this is, as I assume, the long-awaited ♂ to *delineata* Walk. (vera), authors have scarcely been justified in sinking to this the Indian *canidorsata* Walk., notwithstanding that the ♀ ♀ do not seem definitely distinguishable. The present ♂♂ are rather stumper winged and have the sexual hair-tufting in the abdominal region of the hind wing beneath much stronger, posteriorly mostly black.

119. PROCHASMA DENTILINEA Warr.

Psilalcis dentilinea Warr., Proc. Zool. Soc. Lond., 1893, p. 431, Sikkim.

Mt. Murud, 6000-6500 feet, October--November—2 ♂ one of the latter a darker aberration.

Sikkim, Burma, Malay Peninsula and Borneo are the hitherto known localities of this species. The metallic metathoracic crest on which Warren founded the genus *Prochasma* is as well-developed in this species as in the genotype.

120. *PROCHASMA SCISSIVESTIS* sp. n.

♂ 21 mm. ; ♀ 24 mm.

Head white, with a few black dots. Palpus short and stout; blackish with pale tip. Antennal pectinations much shorter than in the typical species. Thorax above black; metathoracic crest lower than in the other species, the admixture of metallic scaling perhaps less strong. Abdomen white, with black irroration and clouding (lost in type).

Fore wing with the coincident vein (SC^{1+2}) well free; fovea large; white, finely irrorated with black; some blue-grey scaling between postmedian and subterminal lines, except at hind margin; a highly irregular vandyke-brown cloud occupying basal area and cell and forming a posteriorly attenuated band just proximally to the postmedian; cell-mark small, black, inconspicuous; lines marked by costal spots, otherwise obsolescent; antemedian fairly direct, bounding the basal area; postmedian gently incurved between R^3 and M^2 , extremely oblique inward from M^2 to fold, then slightly oblique outward; subterminal dentate, almost obsolete in posterior half, in anterior edged proximally and distally with black shading. Hind wing with termen scarcely at all crenulate, very slightly sinuate inward between SC^2 and R^3 ; white with fine black irroration (weakest costally); abdominal edge tinged with brown; cell-spot and postmedian line distinct, the latter little bent, punctuated on the veins; subterminal indicated by some proximal shading.

Fore wing beneath more suffused anteriorly, the vandyke shades replaced by black-grey; hind wing nearly as above.

Mt. Murud, 6000--6500 feet, October—1 ♂, 1 ♀.

121. *DIPLURODES FIMBRIPEDATA* Warr.

Ectropidia fimbripedata Warr., Nov. Zool., vii, p. 113, 1900, Perak.

Lio Matu, December—1 ♂.

Apparently not previously recorded outside the Malay Peninsula.

122. *MEDASINA VINACEA* sp. n.

♂ 58--62 mm.

Head and body concolorous with wings; pectus browner. Face brown, narrowly white below and very narrowly above. Vertex mixed with brown. Palpus about $1\frac{1}{2}$, blackish-mixed on outer side. Antennal pectinations long (perhaps 10). Hind tibial hair-pencil light brown.

Fore wing shaped as in *albidaria* Walk., or slightly broader; white, suffused almost throughout with pale or light vinaceous-drab and irrorated with brown; markings much as in *albidaria*, the lines arising from black costal spots, indistinct, but accompanied by brown shading and marked with black dots or minute teeth on the veins; median rather less strongly ex-curved, passing round the obscure greyish cell-mark, sometimes almost crossing it, posteriorly nearer to postmedian than to antemedian, with a sharp proximal tooth at SM^2 ; dark mark behind R^3 outside the postmedian, sometimes developed into a roundish black-grey spot; subterminal shade not or scarcely darkened at costa. Hind wing with cell rather shorter than in *albidaria*; concolorous with fore wing, rather white at base; markings much as in *albidaria* but with the median line or shade close to cell-dot, the postmedian a little more regular than in that species.

Fore wing beneath with a broad (at R^2 9 mm.) black-brown terminal band, reaching termen at SC^5 -- R^2 and again at tornus, enclosing apically and behind R^2 large white terminal spots; cell-spot large; a median shade just proximal to it. Hind wing similar, the terminal white marking more band-like, only interrupted at radial fold.

♀ similar, the white ground-colour less obscured.

Mt. Poi, 4400 feet (♂ type), 4500 feet (♀ allotype), 3500 feet—1 ♂; Mt. Murud, 6000--6500 feet, October—1 ♂.

123. *DILOPHODES ELEGANS auribasis* subsp. n.

♀ 53 mm.

Distinguishable at a glance from the other races in having the base of the fore wing orange, concolorous with the thorax, the abdomen above white. The maculation of the wings, which will doubtless prove as variable as in the allies, shows a tendency toward longitudinal extensions and coalescences; in particular the last row of spots before the terminal on the fore wing shows a very strong development, is anteriorly almost entirely confluent with the preceding series (forming a nearly solid apical patch from costa to R^3) and the spot on M^1 , being much enlarged, encroaches much more on the midterminal projection of the ground-colour than in the other races.

Mt. Murud, 6000--6500 feet, October, the type only.

I have seen a damaged example from the Malay Peninsula. In the present specimen the long stalk of $SC^{1'2}$ anastomoses at a point with C, but the venation of the species is notoriously inconstant; see Hampson (Faun. Ind. Moths, iii, p. 305).

124. STALAGMIA GUTTARIA Guèr.

Phalaena guttaria Guèr., Icon. Règne. Anim., ii, pl. 30, fig. 2, 1836 (?).

Foot of Mt. Dulit—1 ♀.

Range. Singapore, Java, Sumatra, Borneo.

Explanation of Plate 7.

GEOMETRIDAE.

- Fig. 30. *Eupithecia dinosia*.
 ,, 31. *Chloroclystis obturgescens*.
 ,, 32. *Eupithecia delozona*.
 ,, 33. *Goniopteroloba biconjuncta*
 ,, 34. *Eois mixosemia*
 ,, 35. *Derambila propages*
 ,, 36. *Anisodes pyrrhocrica*
 ,, 37. *Scopula oedocnemis*.
 ,, 38. *Scopula leucopis*
 ,, 39. *Horisme murudensis*.
 ,, 40. *Collix blosyra*.
 ,, 41. *Rhinoprora eurymesa*
 ,, 46. *Asura crustata*.
 ,, 49. *Dalima mjöbergi*

All are types of ♂ named by L. B. Prout, except fig. 32 which is a ♀, and fig. 46 which is a ♂ Arctiid described by G. Talbot.



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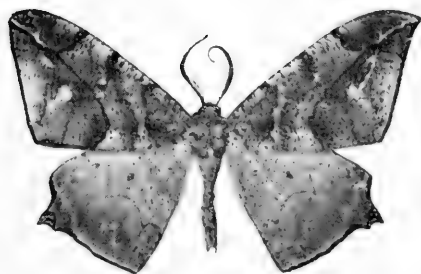
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XIII.—Noctuid Moths from some of the Mountains of Sarawak. By MISS A. E. PROUT.

(With one Plate.)

As regards the numbers and, especially, the quality of species represented, the Noctuids of these collections are extremely interesting, though few occur in long series, a large number being single specimens. This has made the work of identification somewhat laborious, but the results have quite compensated by their interest for the labour involved, and the collections should prove of considerable value in enlarging our knowledge of the distribution of the Noctuidae in this very rich and interesting subregion.

Of the 66 species listed here 27 seem to be forms new to science or hitherto undescribed, whilst several of the others are doubtful identifications or new subspecies which there is insufficient material to establish, so that scarcely one-half are common or even certainly determined species.

Of the 27 new species and subspecies three are unfortunately too poor to be described; the others belong to the following subfamilies: *Acronyctinae* (5); *Erastrinae* (3); *Stictopterinae* (2); *Acontianae* (5); *Diptherinae* (1); *Ophiderinae* (8).

The Mt. Murud collection is certainly the most numerous of the five and the richest in new forms, 15 of the types coming from that locality, 3 from the summit and the others (where any elevation is given) from at least 6500 feet. This bears out our previous observations that, as a rule, collections begin to be really rich in species and (especially) in new forms of Noctuidae only at an elevation of well over 4000 feet. The Mt. Poi and Mt. Penrissen collections are both very interesting, the former being considerably richer in specimens and embracing 5 types, whilst the latter is remarkable for the fact that of the 8 specimens listed here, 3 are holotypes, 1 is a neallotype, and 2 others are paratypes; for the rarity of

species received, Mt. Penrissen takes the highest place of all, although the elevation of the majority of these is only 4400 feet and two species come from yet lower elevations. From Bakong we only received 4 common Noctuids; from Mt. Dulit only 7 specimens listed here, though one of these is the holotype of a new subspecies.

It will be noticed that the larger part of the previously known species were originally described from Sarawak or at least from the Malayan subregion; but a few are Indian insects which seem only to have been known from that subregion, and one (*Hulodes hilaris*) had been recorded only from the Papuan subregion.

Except in the *Ophiderinae*, references to number of specimens in Coll. Brit. Mus. are taken almost entirely from Hampson's "Catalogue of the Lepidoptera Phalenaë" (Vols. IV to XIII); it is not improbable that in some instances additional specimens have been received since the publication of that work.

AGROTINAE.

1. EPISILIA OCHRACEA Wlkr. form *frontalis* Moore.

Ozira ochracea Wlkr., Spec. Lep. Ins., xxxii, p. 657, 1865, Ceylon.
Graphiphora frontalis Moore, Lep. Ceyl., iii, p. 35, 1884, Ceylon.

Mt. Murud, 6000-6500 feet, October—2♀.

Certainly nearer to the *frontalis* than to the typical form but somewhat more variegated and a little paler than the type of *frontalis*; quite likely to be a distinct race as *ochracea* is only known from Ceylon; but from 2♀ it is impossible to decide with certainty the exact standing of the form. The other synonyms and localities quoted by Sir G. Hampson in his Cat. Lep. Phal., iv, p. 488, under *ochracea* appear to be erroneous.

ACRONYCTINAE.

2. MAGUSA OENISTIS Hmps. *murudensis* subsp. n.

♂ 45 mm.

Agrees very closely in size and colour with the typical form of *oenistis* Hmps., Cat. Lep. Phal., vii, p. 56, pl. cix, fig. 8, 1908, Brit. New Guinea, but the termen of fore wing is

distinctly more elongate in subspecies *murudensis* and the hind wing is less strongly produced to tornus. In coloration and pattern *murudensis* more nearly agrees with the typical form than with subspecies *pallida*, A. E. Prout, Bull. Hill Mus., 1, p. 202, 1922. Cent. Ceram., but the orbicular is smaller than in New Guinea specimens, the pale, waved sub-terminal line more clearly defined. The hind wing is a little paler than in typical *oenistis*, especially on the proximal half, and the discal lunule on the under side is distinctly larger.

Mt. Murud. 6000--6500 feet, November—2 ♂.

3. DIPTERYGIA VAGIVITTA Wlkr.

Dipterygia vagivitta Wlkr., Journ. Linn. Soc. Zool., vi, p. 185, 1862, Sarawak.

Lio Matu—1 ♀.

A local species, only recorded from Sarawak, though also represented in Coll. Joicey from S.W. Sumatra. Sir G. Hampson also mentions a subspecies from Christmas Is. It seems extremely probable that *indica* Moore, Proc. Zool. Soc. Lond., 1867, p. 51, and *japonica* Leech, Proc. Zool. Soc. Lond., 1889, p. 489, pl. 1, fig. 9, are also races of *vagivitta*. The Lio Matu specimen is a somewhat dark aberration.

4. TRACHEA ALBIDISCA Moore.

Hadena albidisca Moore, Proc. Zool. Soc. Lond., 1867, p. 59, pl. 6, fig. 17, Sikkim.

Mt. Murud, 6000--6500 feet, November—1 ♀ : Mt. Poi, 4400--5200 feet—8 ♂.

This species seems to have been recorded from China and India only, though specimens of it from Sarawak have been submitted to us by the Raffles Museum. Sarawak specimens are a little more sharply marked on the fore wing than Indian ones, slightly paler and more buff on the hind wing, with rather better developed cell-spot and postmedial line; they have also slightly less white at apex of fore wing and the ♀ (from Mt. Murud) has the white discal spot a little reduced in size. But all these differences are very slight, so that it has not seemed wise to erect a subspecies without seeing more material from both localities.

5. *TRACHEA ISOSCELATA* sp. n.

♂ 33 mm.

Antenna with short ciliation. Fore wing with down-turned hair in the cell, nearly as in *atrovirens*, *Hadena atrovirens*, Moore, Proc. Zool. Soc. Lond., 1867, p. 58, Sikkim, but weaker in anterior half. In Cat. Lep. Phal., vii, Sir G. Hampson ignores the presence of this hair in *atrovirens* and some of the neighbouring species, implying its absence in his keys. Abdomen clothed with rough hair and with slight lateral tufts.

Frons, body and legs predominantly buff or drab, with some fuscous shading; vertex of head and thorax deep olive-green with fuscous scales intermixed.

Fore wing above green suffused with fuscous-brown; four or five fuscous spots proximally and distally to the subbasal line, followed before the hind margin by a large fuscous patch; the medial fuscous area somewhat blacker and more distinctly triangular in shape than in *atrovirens*; this point differentiates *isoscelata* from all nearly-allied forms, the dark patch forming an almost perfect isosceles triangle, of which the antemedial line forms the base and the apex rests upon the costa just before apex of wing; this patch is only indistinctly interrupted by the pale-outlined orbicular and reniform and the anterior third of postmedial line, which latter is double, oblique from costa to SC⁵, thence inwardly oblique and waved; subterminal line weakly dentate (more strongly so on R³, M¹ and M²), dark-outlined on each side from SC⁵ to hind margin, where it is sharply bent outward to tornus; termen and middle of postmedial line pale bluish-grey; fringe ochraceous-buff, broadly shaded between the veins with fuscous. *Hind wing* very pale buff at base, broadly fuscous on distal half, the fringe bright buff. *Under-side* predominantly fuscous, the fore wing more ochraceous at termen, hind wing very pale buff on the proximal posterior fourth of wing.

Mt. Poi, 5200 feet—1 ♂.

6. *TRACHEA EMPHANES* sp. n.

♂ 4 mm.

Antenna with short fasciculate cilia.

Body and wings predominantly whitish, with some pale buff and tawny-brown shading; the veins streaked with tawny and white.

Fore wing with the lines and stigmata (except the claviform) white outlined on each side by brown, the subbasal and postmedial lines accompanied distally, the antemedial proximally by a broad very pale tawny shade; subbasal outwardly oblique to cell, inwardly oblique to SM^2 , the hind margin beyond it streaked with white; antemedial weak at costa, obliquely excurved from the subcostal to hind margin; claviform faintly pale-outlined; orbicular an oblique white dash connected by a white streak behind M with the reniform, which is irregularly 8-shaped, each half filled in with tawny-brown, with a large white spot before it on costa; postmedial line excurved from costa to M^1 (where it nearly touches the reniform), slightly excurved in fold, obsolescent behind SM^2 ; and in fold. *Hind wing* whitish-buff, the distal half suffused with pale reddish-fuscous. *Underside* whitish-buff, with slight fuscous shade on distal third; almost unmarked.

Mt. Murud, November, without exact elevation, one worn ♂.

It is possible that this specimen may have been originally tinged with green, but it shows no definite trace of that colour. Quite distinct in its markings from all other *Trachea* species yet known to me.

In both the foregoing species R^1 of the fore wing arises behind angle of cell (*well* behind angle in *emphanes*), and they also differ from *atriplicis* Linn., Syst. Nat. Ed., x, p. 517, 1758, Europe, in the following particulars. Hind wing with the cell a trifle shorter, with the costal curving away from the subcostal rather more abruptly; R^2 arising slightly nearer to R^3 and more curved at its origin. Termen of both wings rather more evenly curved (less bent at the middle). Segment 2 of palpus fully diameter of eye (rather less in *atriplicis*); segment 3 more slender, without scaling in front. Fore tibia and tarsus nearly half as long again as in *atriplicis*, the tarsus more slender, not thickened at the joints. Abdominal crests on segments 2 and 3 looser (and longer?), with the scaling less compact.

In all these points the foregoing species agree much better with *aurigera* Wlkr., Spec. Lep. Ins., xv, p. 172, 1858, Sikkim, the type of the genus *Berrhoea* Wlkr., which may probably want separating from *Trachea* when a more careful revision of this group is undertaken. In the meantime the above two species may be regarded as members of the

Berrhoa section of *Trachea*, *emphanes* being somewhat aberrant in the distance of R^1 of fore wing from angle of cell.

7. *EUPLEXIA ALBOVITTATA* Moore *melasema* subsp. n.

♂ 36--39 mm.

Differs from typical *albovittata* Moore, Proc. Zool. Soc. Lond., 1867, p. 57, pl. 6, fig. 16, Sikkim, in the size being slightly smaller, the fore wing above a little less elongate and more darkly marked, the hind wing above and beneath a little more broadly darkened on costal and terminal areas. The medial dark band of fore wing is slightly broader than in the type-form, with the proximal tooth rather longer and more sharply pointed; the costa is darkened to apex (except for the usual white dots) and there is a rather narrow dark patch on anterior third of wing between reniform and post-medial line. The white discal spot on fore wing is much smaller than in typical *albovittata*, the dark spot on hind wing practically obsolete.

Summit of Mt. Murud, 7200 feet, November—2 ♂.

This subspecies is almost entirely without the tawny shades which are so noticeable in some *albovittata* forms and subspecies.

8. *ERIOPUS PRYERI* Btlr.

Platydasys pryeri Btlr., Proc. Zool. Soc. Lond., 1892, p. 126, pl. 6, fig. 6, Sarawak.

Bakong—1 ♀.

A moderately common insect, though somewhat local, recorded by Sir G. Hampson from Singapore and Borneo only. Warren, in Seitz Macro-Lepid., iii, p. 159, implies that *pryeri* also occurs in the Maiay Peninsula and Amboina.

9. *ERIOPUS MAILLARDI* Guen. (?)

Eriopus maillardi Guen., Maillard's Réunion, Lép., p. 39, pl. 22, fig. 8, 1862, Reunion.

Lio Matu, 1 ♀ in poor condition, not certainly identified, but appears to belong to this common species, which occurs almost throughout the Ethiopian and Indo-Australian regions.

10. *ERIOPUS EXOTICA* Guen.

Eriopus exotica Guen., Spec. Gén. Lép., vii, p. 294, 1852, Java.

Bakong—1 ♂.

Found chiefly in the Borneo subregion, being recorded by Sir G. Hampson from Singapore, Java, and Sarawak only. Warren records its occurrence also in Assam, the Malay Peninsula, Bali and the Natuna Islands.

11. *ERIOPIUS CONCINNA* sp. n.

♂, ♀ 19--20 mm.

Antennal shaft normal. Tarsi glabrous; tibiae apparently only quite moderately fringed with hair; ♂ with a broad fold on proximal half of costa beneath, edged with very broad down-turned scales, which almost entirely cover the cell and extend across proximal end of submedian fold; M^2 rather strongly down-curved at its origin in ♂ (scarcely so in ♀).

Fore wing pale buff, banded with fuscous between the subbasal and antemedial lines, more or less suffused with rufous to postmedial line and slightly tinged with green on terminal area, especially in the ♀, which has less dark irroration than the ♂; lines pale, waved, dark-outlined, the subbasal and antemedial excurved throughout, the postmedial excurved at fold, bent outward to hind margin; claviform a slight patch of black scales; orbicular a black dot; reniform a more or less rounded patch of black irroration; a triangular dark mark on termen at about SC^5 to R^2 , with oblique pale teeth before and behind it. *Hind wing* whitish suffused with fuscous, with slight discal spot and postmedial line; a line distally to the postmedial and the fringe paler. *Underside* of both wings paler; hind wing with large, very black discal spot and rather broken postmedial line; fore wing with weaker spot and line and with fringe tipped with black.

Mt. Poi, 5200 feet—1 ♂; 4500 feet—1 ♂; Mt. Penrissen, 4400 feet—1 ♂, 1 ♀.

This appears to be an *Eriopus*, although the areole is minute (almost closed up), the scale-tooth at tornus is slight and the thorax is clothed *almost entirely* with scales, hardly "with hair and scales." Somewhat recalls a very small *Amyna* species, but R^2 of the hind wing is too much in the middle of the discocellulars for that genus. The fold and scales on fore wing beneath place it in a distinct section of the genus.

ERASTRIANAE.

12. *ENISPA OLIGOCHRA* sp. n.

♂ 17 mm.

Tongue present, though slender; antenna with long ciliation. Termen of both wings rounded.

Frons, palpus and legs pale brown shaded with darker brown; vertex of head, patagia and tegulae whitish-buff; the rest of the wings, thorax and abdomen rather pale purplish-brown; fringes buff shaded with pale rufous. *Fore wing* with three paler, more rufous lines, the ante- and postmedial (or medial) nearly straight, the subterminal strongly excurved from costal pale area to R^1 and from R^1 to M^2 , these lines indicated at costa by dark spots; both wings with terminal row of black points. *Underside* pale grey, with costa of fore wing and fringes buff; fore wing more fuscous on proximal half; hind wing with darker discal spot and curved post-medial line.

Mt. Murud, 6500 feet, November—1 ♂.

By Hampson's key in *Cat. Lep. Phal.*, x, this species should fall with *flavicineta* Hmps. n., *Cat. Lep. Phal.*, x, p. 5, pl. cl, fig. 1, 1910, Singapore, but the two species are at once distinguishable by the broad pale shade at apex and on termen of fore wing in *flavicineta*, which is entirely wanting in *oligochra*.

13. *EUBLEMMA COCHYLIOIDES* (Guen.).

Micra cochylionides Guen., *Spec. Gén. Lép.*, vi, p. 245, 1852, Bourbon Is.

Pah Trap, November—1 ♀.

This species which is extremely widely distributed through the Ethiopian and Indo-Australian Regions has not at present been found to show any distinct racial variation.

14. *TOANA* species.

Mt. Poi, 4400 feet—1 ♂; Mt. Dulit, 3000 feet—1 ♀, probably the ♀ to the Mt. Poi ♂.

Both these specimens are, unfortunately, too poor to be made the type of a new species without risk of creating confusion for future workers, though the species appears to be new.

The general tone of wings above is rufous; the ♀ shows large yellow discal spots on both wings, which appear to be

absent in the ♂. The wings are paler beneath, especially the hind wing, which in the ♂ shows traces of yellow androconia as far as the pinkish postmedial line; the fore wing in both sexes is suffused with pale rufous in cell and fold. In structure both specimens seem to agree perfectly with Hampson's diagnosis of the genus *Toana* in Cat. Lep. Phal., x, p. 204.

TOANOPSIS gen. n.

Proboscis, eye and frons normal. Palpus rather short, with segment 2 slender, curved, hardly diameter of eye; segment 3 glabrous, acute, about one-fourth length of 2 or rather more. Legs normal; fore tibia and tarsus about one-third length of fore wing; mid-tibia and tarsus about three-fifths of fore wing; hind tibia and tarsus about two-thirds of fore wing. Thorax clothed chiefly with scales, apparently with rather flattened crests on pro- and metathorax. Abdomen with rather flattened scales (crests?) on one or two basal segments. Refraculum semiquadrate. Anal tuft small. ♂ antenna typically with even ciliation somewhat more than diameter of shaft.

Fore wing with termen strongly curved, hardly crenulate; apex acute; costa flattened throughout. Cell about one-half length of fore wing, with discocellular 2 very weak; SC¹ from about (or just beyond) three-fifths of cell; SC² from a little before angle of cell; SC³, SC⁴, SC⁵ stalked, SC⁴, SC⁵ to fully three-fifths, SC³ to scarcely one-fifth; R¹ from distinctly *behind* angle; R² from close to angle; M² from about three-fifths of cell; M¹ from about three-fifths beyond M².

Hind wing with termen well-rounded, hardly crenulate; costa slightly arched towards base; cell about three-eighths length of wing, with discocellular 2 very weak; vein C anastomosing to scarcely one-third; R² about as strong as the other veins, from nearly two-thirds of discocellulars, slightly bent upward at its origin; SC⁵, R¹, R³ and M¹ normal; M² from about three-fifths of cell.

Note.—Vein C of hind wing is unusually nearly parallel with SC to end of cell, then rather strongly bent forward in a manner very uncommon in the Noctuidae. The strength of R² of the hind wing might almost place this genus in the

Ophiderinae, but the position of the vein is more as in the *Erastrinae*. Perhaps most nearly allied to *Toana* Wlkr., Spec. Lep. Ins., xxxii, p. 500, 1865.

Type *engenes* sp. n.

15. *TOANOPSIS ENGENES* sp. n.

♂ 24 mm.

Head and thorax dark brown shaded with dull red; abdomen greyish-fuscous. Wings dull brownish-red irrorated with fuscous. *Fore wing* with the costa broadly fuscous and with antemedial, medial and postmedial diffused blackish lines, the two former more or less straight, the postmedial broadly excurved round the cell, strongly bent inward in fold and bent outward to hind margin; a slight pale terminal line, broadening to spots at the veins and preceded by slight black lunules *between* the veins; orbicular represented by a black dot, reniform by a black lunule; all markings very obscure. *Hind wing* reproducing fore wing pattern, except for absence of dark costal shade and antemedial line; the postmedial line curved throughout. *Fore wing beneath* brown-fuscous, with slight dark discal spot and medial shade, a rather stronger, minutely waved postmedial line and four or five pale spots beyond it on costa. *Hind wing* much paler, with dark cell-spot and waved postmedial line. Termen of both wings and fringes as above.

Mt. Penrissen, 3500 feet—1 ♂.

16. *CARMARA SUBCERVINA* Wlkr.

Carmara subcervina Wlkr., Journ. Linn. Soc. Zool., vii, p. 63, 1864, Sarawak.

Mt. Murud, without exact elevation, November—2 ♀; Mt. Dulit, 3000 feet—2 ♀; Mt. Poi, 5000 feet—2 ♂, 1 ♀; 4500 feet—1 ♂; 4350 feet—1 ♀; 4300 feet—1 ♂; 2000 feet—1 ♀.

A widely distributed species, though not abundant; recorded from Ceylon, Borneo, Mysol, New Guinea and Queensland; represented in Coll. Joicey also from Rossel and Sudest Islands. Does not seem to show any strong racial variation.

17. *ORUZA DASYCARA* sp. n.

♀ 29 mm.

Palpus with segment 2 somewhat thickly scaled, segment 3 long (not very much shorter than 2) and densely scaled, somewhat dilated towards extremity; frons with a long tuft of hair above.

Head, thorax, and wings pale buff, largely diffused with pale violaceous-grey, which is somewhat deeper in tone between the oblique antemedial and the postmedial line, forming a darker band across both wings, which on the hind wing leaves only a very small pale area at base of wing, as in *vacillans*, *Selenis vacillans* Wlkr., Proc. Linn. Soc. Zool., vii, p. 189, 1864, Sarawak, which this species recalls in its scheme of pattern, though it is much more variegated in tone and has the anterior half of fore wing less strongly contrasted with the posterior half except at base: the lines somewhat as in *vacillans* but the postmedial much better defined and more waved (especially on fore wing), distally bordered with a yellowish shade, upon which the black spots on posterior half of hind wing stand out rather sharply; on the fore wing there is an oblique, diffused chocolate streak from apex behind the pale subapical patch, connected with an almost horizontal streak to end of fringe between R^2 and R^3 . *Underside* with the proximal half of wings (especially hind wing) darker than in *vacillans*, the hind wing with a pale yellow band from postmedial to subterminal line.

Mt. Murud, 6000-6500 feet, October—1 ♀.

In spite of the rather different palpus and the tuft of hair above the frons, which makes it impossible to see with *certainty* whether there is any frontal prominence, this species seems to fit well into the genus *Oruza* (as at present constituted). In the absence of the ♂ it is impossible to say with certainty in which section of the genus it should be placed.

18. PSEUDACIDALIA FULVILINEA Warr.

Pseudacidalia fulvilinea Warr., Seitz, Macro-Lep., xi, p. 252, pl. 241, 1913, Malay Peninsula.

Mt. Poi, 4500 feet—1 ♀.

Although we have had no opportunity of comparing this specimen with Warren's type, it answers so well to the figure and description that I have felt no hesitation in referring it to this very interesting species, of which the ♀ type only seems to have been previously recorded. If the figure in Seitz Macro-Lep. is accurately coloured, the Malayan form is somewhat more rufous in tone than the Sarawak (which has very little rufous tinge), but from two specimens it is quite impossible to judge whether this is a racial variation.

19. LITHACODIA MARGINALIS Wlkr.

Acontia marginalis Wlkr., Journ. Linn. Soc., vii, p. 49, 1864, Sarawak.

Mt. Dulit, 3000 feet—1 ♂.

Recorded by Sir G. Hampson, in Cat. Lep. Phal., x, p. 507, from India, Ceylon, Sarawak, Pulo Laut and Java. Probably not uncommon, though (like many of *Erastrinae*) somewhat overlooked on account of its small size.

EUTELINAE.

20. BOMBOTELIA SIMPLEX Wlkr.

Eutelia simplex Wlkr., Spec. Lep. Ins., xxxiii, p. 824, 1865, (hab. ign.).

Mt. Murud, 6500 feet, November—1 ♂.

A fairly common species in India; occurring also in Singapore, Sarawak, Cent. Ceram, Cent. Buru and the Fiji Islands. When more fully worked out it may very likely show some racial variation, but this is not apparent to any casual observation.

21. EUTELIA ANGULIFERA Wlkr.

Anophia angulifera Wlkr., Journ. Linn. Soc., vii, p. 171, 1864, Sarawak.

Mt. Dulit, 3000 feet—1 ♂.

A somewhat rare species, recorded from Sarawak only.

22. ANIGRAEA RUBIDA Wlkr.

Anigraea rubida Wlkr., Journ. Linn. Soc., vi, p. 139, 1862, Sarawak.

Mt. Murud, without exact elevation, November—1 ♀.

Recorded from India, Singapore and Sarawak, not abundant though not really rare. The specimen from Mt. Murud belongs to a strongly-marked form with a highly raised, chocolate-brown discal tuft of scales on the fore wing; larger and finer than specimens in Coll. Joicey from Ceylon, Perak and Sarawak, but seeming to agree with one or two specimens in Coll. Brit. Mus. as *rubida*. There may possibly be two species mixed here, but from the size and the more rufous coloration of the figure of type in Cat. Lep. Het. Oxf. Mus., pl. 11, fig. 16, this apparently belongs to the typical form, though the type itself is unknown to me.

STICTOPTERINAE.

23. STICTOPTERA POIENSIS sp. n.

♂ 36 mm.

Fore wing purplish in tone, the proximal half (to medial line) deeper purple; antemedial line very strongly bent outward before and behind M and followed by two or three undulating lines, the best defined of which represents the medial line; a broad black mark in fold in the position of the claviform stigma; an oblique blue streak between postmedial and subterminal lines from R^3 to M^2 ; postmedial line and dark subapical dashes about as in *signifera*, *Steiria signifera* Wlkr., Spec. Lep. Ins., xiii, p. 1136, 1857, Sarawak: border of hind wing more as in *subobliqua*, *Steiria subobliqua* Wlkr., *ibid.*, Ceylon. Underside with the postmedial line more sharply defined and rather more crenulate than in either *signifera* or *subobliqua*.

Mt. Poi, 5000 feet—1 ♂.

In addition to the differences mentioned above, *poiensis* can be at once distinguished from *signifera* by the flattened costa of fore wing and more oblique termen; in *signifera* the costa is somewhat highly arched. In *subobliqua* the fore wing is slightly broader than in *poiensis* and the postmedial line beneath is almost obsolete, the average size larger.

One specimen in Coll. Brit. Mus., from Singapore, placed by Sir G. Hampson under *signifera*, appears to belong to this species.

24. STICTOPTERA SEMIALBA Wlkr.

Minica semialba Wlkr., Journ. Linn. Soc., vii, p. 175, 1864, Sarawak.

Mt. Poi, 5200 feet—1 ♂; Mt. Penrissen, 4400 feet—3 ♀; Mt. Murud, 6000--6500 feet, November—1 ♀.

The ♂ (from Mt. Poi) seems quite a typical *grisea* form of *semialba*, *Stictoptera grisea* Moore, Proc. Zool. Soc. Lond., 1867, p. 67, Sikkim; the ♀ are more uncertain, being a little intermediate towards *ferrifera*, *Steiria ferrifera* Wlkr., Journ. Linn. Soc., vii, p. 173, 1864, Sarawak, in the breadth of terminal band and darkening of hind margin of hind wing; but the medial and postmedial lines of fore wing are more as in *grisea* and as the ♂ almost certainly belongs to that species, it has seemed best to refer the ♀ also to *semialba*, form *grisea*.

One ♀ from Penrissen has the fore wing appreciably shorter and broader than the others, and is darker beneath, the fore wing being without the white in cellules 1b to 5 and having the costa of both wings rather more darkened. Quite possibly the ♀ to an, as yet, unknown ♂, but as it is taken at the same elevation as two more normal ♀ and the markings of fore wing above seem to be those of a dark *grisea* form it has seemed best to refer it to that species.

One of the other two Mt. Penrissen ♀ has the not-uncommon V-shaped white patch on proximal half of fore wing. The Mt. Murud ♀ has the proximal half of fore wing largely suffused with greyish-black.

But for a long series of *semialba* (typical and *grisea* forms) and of *ferrifera* in Coll. Joicey from S.W. Sumatra, which are quite easily separable, *ferrifera* might almost be regarded as a broad-bordered aberration of *semialba*, the two species being exceedingly close in size, shape and pattern of fore wing.

25. LOPHOPTERA CHALYBEA Wlkr.

Gadirtha chalybea Wlkr., Journ. Linn. Soc., vii, p. 161, 1864, Sarawak.

Mt. Murud, 6500 feet, November—1 ♀; Pah Trap, November—1 ♂.

A good species, which seems only to have been previously known from the types of *chalybea* and *polygrapha*. *Gadirtha polygrapha* Wlkr., Journ. Linn. Soc., vii, p. 162, 1864. Sarawak. The types are, unfortunately, unknown to me, but the identification seems quite a safe one. Whether *polygrapha* sunk by Colonel Swinhoe to *chalybea* is really synonymous seems a little more uncertain.

26. LOPHOPTERA TRIPARTITA Swinh.

Gyrtona tripartita Swinh., Ann. Mag. Nat. Hist. (7), ix, p. 84, 1902, Perak.

Mt. Murud (?)—1 ♀. Belonging to the Mt. Murud collection but with the exact data wanting. A small aberration.

Recorded by Sir G. Hampson, in Cat. Lep. Phal., xi, p. 193, from Penang, Perak and Borneo. Also in Coll. Joicey from other parts of the Malay Peninsula and Java. Nowhere common, generally taken singly; perhaps a good deal overlooked.

27. *NIGRAMMA QUADRATIFERA* Wlkr. *eusema* subsp. n.

♀ 36 mm.

Head, patagia and prothoracic crest orange-brown shaded with chocolate, contrasting with the rest of the thorax and tegulae, which are violet-grey with only a few chocolate scales intermixed, the patagia and tegulae more broadly-scaled than in typical *quadratifera*, *Nigramma quadratifera* Wlkr., Spec. Lep. Ins., xxvii, p. 77, 1863, Ceylon, with much more of the metallic blue sheen which is occasionally present on a few scales on the thorax and fore wing of typical specimens. Fore wing more purple-grey than in the majority of typical *quadratifera*, with some chocolate-brown shading on the rounded orbicular and reniform stigmata and on each side of the subterminal line, and with oblique brown bars from the costa to the two stigmata. Orbicular rather better developed than in typical *quadratifera*. Terminal black spots on both wings rather broader than in the type-form. Under surface darker, the termen of hind wing almost as dark as the postmedial line, the fringe rather more darkened.

Mt. Murud, 7200 feet, November—1 ♀.

In spite of the fact that only a single ♀ from Sarawak is known to me the general appearance is so distinct from that of other specimens which I have seen that it has seemed safe to regard this as a distinct race from *quadratifera quadratifera*, which appears to be confined to Ceylon, where it is not uncommon.

28. *GYRTONA SEMICARBONALIS* Wlkr.

Gyrtona semicarbonalis Wlkr., Spec. Lep. Ins., xxvii, p. 92, 1863, Sarawak.

Mt. Murud, 6000--6500 feet, November—2 ♂, 4 ♀; without exact elevation, November—1 ♀, 2 ♂; without date—1 ♂.

An exceedingly variable series, but all agreeing in shape, in the hind wing and in the very characteristic subterminal dark spot in fold of fore wing. Two or three specimens belong to the typical form of *semicarbonalis*, and it seems probable that all are aberrations of one species.

A not common species, recorded from Ceylon, Perak, Singapore, Borneo, and New Britain. A series of specimens in Coll. Joicey from Cent. Ceram may also have to be referred to this species.

29. *GYRTONA OCHREOGRAPHA* Hmps.

Gyrtona ochreographa Hmps., Cat. Lep. Phal., ix, p. 216, 1912, Singapore.

Mt. Murud, 6000--6500 feet, October—1 ♀ ; November, without exact elevation—1 ♂.

Not a certain identification, but this appears to be a form of *ochreographa*, of which there are 2 ♂ and 1 ♀ in Coll. Brit. Mus., all from Singapore. In the Sarawak specimens the termen of fore wing seems slightly more oblique, but otherwise they agree well with the type.

30. *GYRTONA PROXIMALIS* Wlkr.

Gyrtona proximalis Wlkr., Spec. Lep. Ins., xxvii, p. 90, 1863, Sarawak.

Mt. Murud, 6000--6500 feet, October—1 ♀.

This species seems not uncommon in the Malayan subregion. It is recorded by Sir G. Hampson, Cat. Lep. Phal., xi, p. 218, from Selangor, Perak, Singapore, and Sarawak.

SARROTHRIPINAE.

31. *NANAGUNA BREVIUSCULA* Wlkr.

Nanaguna breviuscula Wlkr., Spec. Lep. Ins., xxvii, p. 85, 1863, Sarawak.

Mt. Murud, 7200 feet, November—1 ♀.

A common species, widely distributed throughout the Indo-Australian region, from the Punjab to Australia.

32. *LABANDA SATURALIS* Wlkr. (?)

Labanda saturalis Wlkr., Spec. Lep. Ins., xxxiv, p. 1251, 1865, India.

Mt. Murud, 6000--6500 feet, October—1 ♀.

This specimen appears somewhat too broad-winged for *saturalis* and may belong to a distinct species, but as the condition is rather poor, it is impossible to settle the question with certainty and it has seemed safer to regard the specimen as *saturalis*, which is recorded from Borneo, as well as from North and South India and Burma.

33. *RISOBA GLAUCA* Hmps.

Risoba glauca Hmps., Cat. Lep. Phal., xi, p. 428, 1912, Borneo.

Mt. Murud, without exact elevation, November.

Represented in Coll. Brit. Mus., by the ♀-type only. In Coll. Joicey from Sarawak and S.W. Sumatra.

In the ♀ from Mt. Murud there is less brown shading than usual on the proximal half of wing, but this appears to be simply aberrational, the specimen agreeing well in other respects with the typical form. Wings a little more blue-green, evidently owing to newer condition.

34. *RISOBA DIVERSIPENNIS* Wlkr.

Heliothis diversipennis Wlkr., Spec. Lep. Ins., xv, p. 1750, 1858, Punjab.

Lio Matu—1 ♂.

The anterior two-thirds of the proximal half of fore wing are unusually darkened, but there seems no doubt as to the species, which is recorded from the Punjab, Burma, Malay Peninsula, Singapore and Borneo. All in Coll. Joicey from Shanghai.

35. *MACROBARASA XANTHOSTICTA* Hmps. n.

Argyrothripa xanthosticta Hmps. n., Moths Ind., ii, p. 381, 1894, Sikkim.

Blenina xantholopha Hmps. n., Moths Ind., iv., p. 526, 1896, Assam.

Mt. Murud, November—3 ♀; Mt. Poi, 5200 feet—1 ♂.

Although this species (under the two names, *xanthosticta* and *xantholopha*) is only recorded by Sir G. Hampson from India, it occurs also in Ceylon, and in the mountains of Sumatra, Buru, Ceram, and New Guinea, where it is often exceedingly abundant.

ACONTIANAE.

36. *TITULCIA RUFIMARGO* Hmps. n.

Titulcia rufimargo Hmps. n., Cat. Lep. Phal., xi, p. 484, 1912, Sarawak.

Mt. Poi, 4350 feet—1 ♀.

A rare or overlooked species, previously known to me from the ♂-type only.

37. *EARIAS MJÖBERGI* sp. n.

♂ 30 mm.

Mid femur of ♂ much dilated, the tibia fringed with long hair on each side. Palpus normal.

Abdomen, pectus and legs more or less yellow, the legs partly purplish-brown, the tarsi ringed with white. Thorax and fore wing pale yellowish-green; termen and fringe a little darker green; a yellow shade at proximal third of costa. the costa itself at base deep brownish-red; antemedial line erect, faintly marked by deeper green and on proximal third dotted with deep reddish-brown; medial and postmedial lines faintly indicated by deeper green, the former waved, the

latter slightly oblique to R^1 , then erect. *Hind wing* semi-hyaline white, the extreme termen and fringe faintly tinged with green, especially on the anterior half. *Underside* white faintly tinged with green, especially on fringes; fore wing with proximal third yellow behind costa.

Mt. Murud, 6500 feet, November—1 ♂.

Quite a distinct species, intermediate between sections i and ii of Hampson, Cat. Lep. Phal., xi, pp. 496--498.

38. *HYLOPHILODES DUBIA* sp. n.

♀ 38 mm.

Head and patagia very dull green; thorax apparently more or less whitish (almost descaled); abdomen appears whitish with some yellow hair on dorsum. *Fore wing* pale green, irrorated with dull green towards costa, the costa itself pale rufous (more conspicuously so towards apex); lines somewhat as in *rubromarginata*, *Hylophila rubromarginata* Beth-Bak.. Nov. Zool., xiii, p. 219, 1906, Brit. New Guinea, but rather more parallel, more widely separated except at costa, apparently more tinged with red; a small greenish discal lunule; a slight green subterminal line, strongly incurved opposite cell and fold, but not acutely angled; fringe tipped with red; tornus rather acute. *Hind wing* white with a slight yellow tinge which might well be more strongly defined in a fresh-conditioned specimen. *Underside* shining white, fore wing with the costa and tips of fringe rufous.

Mt. Murud, 6500 feet, November—1 worn ♀.

The very poor condition of the single ♀ received has made me hesitate to describe this species as new; but it is almost certainly distinct from all the three previously known species and the acute tornus and direction of the lines, together with the locality, should prove sufficient guide to the identification of specimens which may subsequently be found.

39. *CAREA VARIPES* Wlkr.

Carea varipes Wlkr., Spec. Lep. Ins., x, p. 475, 1856, Malacca.

Bakong—1 ♂.

A fairly common species, occurring in Hongkong, Assam, Ceylon, Malay Peninsula, Singapore, Borneo, Java, and Sumatra. Also in a local race in Ceram.

40. *CAREA PLESIOGRAMMA* sp. n.

♂ 40 mm.

Hind tibia aborted, with only one spur; segment 1 of tarsus very long and dilated.

Head, thorax and fore wing dull ochraceous-brown tinged with rufous, the fore wing glossed with pale purplish-grey from medial to beyond postmedial line and (narrowly) on proximal side of subterminal; the medial and postmedial unusually nearly approximated especially towards costa, the medial straight and slightly oblique, the postmedial rather more oblique and slightly bent inward at fold; subterminal very indistinct, apparently a little excurved before and behind middle of wing; cell with a black dot on medial line, and another between medial and postmedial. *Hind wing* nearly uniform-red, a little tinged with pale fuscous before hind margin. *Underside* nearly uniform dull red.

Mt. Penrissen, 4400 feet—1 ♂.

Nearest to *C. egens* A. E. Prout, Bull. Hill Mus., 1, p. 418, pl. xxii, fig. 9, 1924, S.W. Sumatra, but differs from *egens* in having the markings of fore wing more diffused, and the hind wing more rufous.

41. CAREA ELAEOGRAMMA sp. n.

♂, ♀ 33 mm.

Hind leg as in the preceding species.

Head and thorax purplish-violet, largely suffused with dull olive-green. *Fore wing* pale pink thickly irrorated with violet, with fairly broad basal, medial and postmedial greenish bands, edged on each side by fuscous, the medial and postmedial moderately remote, a little oblique and waved, a minutely dentate, waved subterminal fuscous line, somewhat strongly angled outward before and behind middle of wing. *Hind wing* with the distal half pale red to just behind M^1 , the proximal half whitish, the posterior edge broadly pale grey. *Underside* of the fore wing reddish, of hind wing white, the costa and distal half of fold irrorated with reddish, the Mt. Penrissen ♀ with a reddish postmedial line.

Mt. Poi, 5000 feet—1 ♂; 5200 feet—1 ♀; Mt. Penrissen, 4400 feet—1 ♀.

Probably nearest to *C. nitida* Hmps., Moths Ind., ii, p. 423, 1894, Sikkim, but abundantly distinct.

42. CAREA ANTENNATA Warr.

Carea antennata Warr., Nov. Zool., xix, p. 43, 1912, N. Borneo.

Mt. Murud, summit—1 ♂; 6000--6500 feet, November—12 ♂; without elevation—1 ♂.

Two ♀, one from Mt. Murud, 6500 feet, November—one without exact elevation, are provisionally placed here, though the lines are more waved and the subterminal is not broken into spots. In the ♂ the exact distance between the lines varies perceptibly and the postmedial is slightly more bent behind the middle in some specimens than in others, but they belong unmistakably to one species.

43. *CAREA ELAEOSPILA* sp. n.

♀ 35--38 mm.

Hind leg as in Nos. 40 and 41.

Head olive-green; patagia, thorax and tegulae bright buff shaded with burnt sienna, the patagia tipped with whitish; abdomen grey above, tinged with pinkish beneath; pectus and legs pale violet-pink mixed with white.

Fore wing chocolate-brown largely irrorated with white except between postmedial and subterminal lines, with the cell largely filled in with olive-green between lower angle of cell and postmedial line; the veins from postmedial line to termen streaked with olive-green; antemedial line oblique from one-third costa to near middle of hind margin, angled inward and almost interrupted in cell; postmedial line more or less outwardly oblique and waved from two-thirds costa to R³, oblique to just beyond two-thirds hind margin; a nearly straight row of subterminal black spots between the veins; the fringe dull red. *Hind wing* fuscous with the fringe pale pink. Underside fuscous irrorated with dull red, the fringes dull red (paler and pinker on hind wing); fore wing with a patch of Indian red irroration about the end of areole and origin of subcostals; the fuscous shade (as usual) paler towards hind margin of wings.

Mt. Murud, 6000--6500 feet, October—1 ♀; November—2 ♀.

A very distinct species, perhaps least remote from *C. ocyra* Swinh., Ann. Mag. Nat. Hist. 6, xii, p. 262, 1893, Singapore.

44. *CAREA* species.

Mt. Murud, November—1 ♂.

This appears quite distinct from any previously known *Carea* species, but the condition is unfortunately too poor to admit of any adequate description.

45. *MACEDA MANSUETA* Wlkr.

Maceda mansueta Wlkr., Spec. Lep. Ins., xiii, p. 1141, 1857, Sarawak.

Mt. Murud, 6000--6500 feet, October—1 ♀; November—1 ♀.

A common, widely distributed species, occurring almost throughout the Indo-Australian region from Ceylon to Queensland.

46. *NEGETA SUBLINEATA* Wlkr.

Urbona sublineata Wlkr., Journ. Linn. Soc., vi, p. 184, 1862, Sarawak.

Mt. Poi, 4400 feet—1 ♀.

Although this species is recorded from N. India and Burma, as well as Borneo, it appears by no means common, Coll. Brit. Mus. having only three specimens, whilst the species is wanting in Coll. Joicey.

CATOCALINAE.

47. *PARALLELIA JOVIANA* Stoll.

Noctua joviana Stoll, Pap. Exot., iv, p. 237, pl. 399, f. B., 1782. Coromandel Coast.

Mt. Dulit, 3000 feet—1 ♂.

A common, widely distributed species, occurring from Loochoo Island and N. India to Queensland and the Loyalty Islands.

DIPHTERINAE.

48. *DIPHTERA MJÖBERGI* sp. n.

♂ 47 mm.

Structure normal, but abdomen without the black crests, unless these are worn off. The yellow hair on abdomen and base of hind wing pale, the black markings on thorax concentrated into a broad band on patagia, a large patch on pro- and mesothorax, a large tuft (almost crest) on metathorax, and single spots on the tegulae, joined to the large thoracic patch.

Fore wing very boldly marked, with two black patches, two or three small spots and a horizontal lunule on hind margin near base; somewhat erect but strongly dentate broad black antemedial and postmedial lines, with a spot between them on costa, joined by a bar on M, angled away from each other in cell and fold and approaching one another at hind margin; orbicular a black spot joined to the bar on M; reniform a perpendicular bar across angle of postmedial line; a large spot on costa and erect streaks with spots behind them in cell and fold beyond the postmedial line; subterminal line wavy, broad, thickened and angled inward to the preceding line at cell and fold, joined to termen by a broad patch about R¹. *Hind wing* smoky-grey on distal anterior half, with veins fuscous. *Underside* with yellow hair very pale, covering most of the cell of hind wing; both wings broadly black at and behind apex, in addition to the normal black markings.

Summit of Mt. Murud, 7200 feet, November—1 ♂.

A handsome species, one of the most interesting of all the Noctuidae in this collection.

OPHIDERINAE.

49. SYPNA LUCILLA Btlr.

Sypna lucilla Btlr., Trans. Ent. Soc. Lond., 1881, p. 206, Sikkim.

Mt. Murud, November—1 ♀.

An Indian insect, not previously known to me from the Malayan subregion, but the ♀ from Mt. Murud seems to match well with some Indian ♀. Like many *Sypna* species is distinctly variable.

50. SYPNA RHO-LATINUM sp. n.

♂; ♀ 62 mm.

Male antenna subpectinate with evenly set ciliation from the sides of each tooth and a long fascicle of cilia from the end, the shaft deeply lamellate beneath. Both sexes with *fore wing* rich dark brown with the lines and an oval patch just before middle of termen tinged with pale rufous, one ♂ with the subterminal proximally enlarged to a broad rufous

band; orbicular typically a white dot; reniform pale-outlined, shaped like an almost perfect letter R; antemedial and post-medial lines dark on a pale rufous ground, well-defined, the former slightly angled on SC and very strongly angled outward in fold, the latter strongly (irregularly) excurved round cell, thence nearly erect, slightly excurved in fold; subterminal nearly straight to R^2 , thence gently excurved to M^2 . *Hind wing* brownish-grey with the tornal markings weak, the fringe pale buff to R^2 (faintly darkened at veins), thence smoky-grey to tornus. *Underside* with the dark markings leaden-grey, rather diffused; termen without pale shades; fringe of hind wing as above.

Mt. Murud, November, without exact elevation—1 ♂, 1 ♀; 6000--6500 feet, November—1 ♂ (ab.).

51. SYPNA LUDIFICA Swinh. (?)

Sypna ludifica Swinh., Ann. Mag. Nat. Hist. (8), xvi, p. 180, 1915, Kinabalu!

Mt. Murud, 6000--6500 feet, October—1 ♀; without elevation, November—1 very worn ♀.

This identification is not a certain one as I have been unable to see the type of *ludifica* and neither of the Mt. Murud specimens is in first-rate condition. They certainly belong to this group of the genus, but may agree with *subsignata* Wlkr., Spec. Lep. Ins., xv, p. 1261, 1858, Singapore, rather than with *ludifica*, supposing the two to be distinct species; but as they appear to me to be very probably no more than local forms of one species I have employed the name of the Borneo subspecies; *ludifica* may even prove to be no more than an aberration of *subsignata*.

52. SYPNA SUBROTUNDA sp. n.

♂ 52 mm.

Male antenna with proximal half of shaft moniliform, each segment bearing a thick fasciculate tuft of cilia (about twice diameter of shaft) on each side, the shaft slightly lamellate beneath.

Head, thorax and fore wing above purple-brown with the veins more leaden-grey; the markings a good deal as in *subsignata* (see above), but much less strongly contrasted on proximal half of wing, the postmedial and subterminal lines better defined, the latter with its discal dark edging broader,

especially about cellule 3, where it is broadened to an acute angle almost touching the terminal lunule. *Hind wing* unusually rounded off at apex, much more uniformly darkened than in *subsignata*, with only very faint traces of the pale postmedial line and subterminal half line, though the dark borders of the lines at and towards hind margin are weakly represented; anterior end of fringe whitish, interrupted by dark shading at vein C and almost entirely darkened from just before SC⁵. *Underside* a good deal as in *subsignata*, but more diffused, the postmedial line and border of hind wing less oblique at costa.

Mt. Murud, November—1 ♂.

Probably nearest to *subsignata* and to *S. coelisparva* Wlkr., Spec. Lep. Ins., xiv, p. 1262, 1858, Assam.

53. SYPNA ANISOMERIS sp. n.

♂. ♀ 47--56 mm.

Antenna nearly as in the preceding species but with the ciliation slightly longer. Palpus with segment 3 unusually long, nearly one-third as long again as segment 2.

Coloration and markings somewhat as in the preceding species but the lines more ochraceous, bordered here and there with metallic-blue, the proximal border of subterminal paler, much broader than in *subrotunda*, the distal black border narrower, less produced in cellules 7, 6 and 3; the medial dark band is rather broader but even less conspicuous than in *subrotunda*; reniform much more distinct, with ochraceous outline somewhat as in *rho-latinum* but less distinctly R-shaped. *Hind wing* much paler than in *subrotunda* but more distinctly darkened towards termen, with the subterminal half-line better defined; the fringe pale at base and tips but more or less darkened at middle throughout. *Underside* largely suffused with fuscous, with the postmedial line diffused, nearly straight (not distally broadened) on fore wing, leaving an unusually broad dark border on both wings; the pale areas more darkened than in any of the neighbouring species.

Mt. Murud, 6000--6500 feet, October--November—3 ♂, 2 ♀; November, without elevation—1 ♀. The type is from 6000--6500 feet, November.

Near to *subrotunda*, but the third segment of palpus is longer, fore wing rather broader and hind wing less rounded off at apex. See also differences mentioned above.

54. HULODES CARANEA Cr.

Phalaena Noctua caranea Pap. Exot., iii, p. 140, pl. 269, ff. E.F., 1780, Java.

Mt. Poi, 5000 feet—1 ♀.

There seem to be two closely allied species occurring in Borneo and Sumatra, both passing as *caranea*; this specimen appears to belong to the local species, not to the widely distributed and better known one which is probably the true *caranea*.

55. HULODES HILARIS A. E. Prout.

Hulodes hilaris A. E. Prout, Ann. Mag. Nat. Hist. (9), viii, p. 27, 1921, New Guinea.

Mt. Poi, 4350 feet—1 ♂.

In all probability a close study of the species, based upon larger material, will reveal some racial difference between the typical (New Guinea) and the Sarawak form. In the meantime, the single ♂ from Mt. Poi must certainly be placed here rather than with *drylla* Guen., Spec. Gén. Lép., vii, p. 208, 1852, Central India, from which it differs in the longer, more dilated third segment of palpus and the more acutely angled hind wing.

56. BOCUA DIVERGENS sp. n.

♂ 35 mm.

Segment 3 of palpus extremely short; antennal shaft almost simple, with straight bristles and cilia slightly more than diameter of shaft; anal tuft very long and dense.

Head, body and fore wing pale brown, the wing broadly deeper buff-brown on the proximal half of costal area, flushed with very pale purplish-pink on posterior part and almost whitish about the postmedial line; very broadly chocolate-brown towards termen. Fine antemedial, medial and postmedial lines, almost equidistant, nearly erect but more or less strongly waved; the dark terminal shade reaching nearly to postmedial line at middle of wing, a little curved away to costa and bent outward to tornus from about M^2 ; reniform a black spot, orbicular almost obsolete; medial line with a second slight, similarly waved line on its distal side from M to hind margin. Hind wing pale fuscous-brown, with dark cell-dot and pale fringe. Underside pale buff, the fore wing largely suffused with fuscous-grey except on the veins, the costa deep buff. Hind wing with dark cell-spot and slight postmedial line.

Mt. Poi, 5000--5200 feet—2 ♂ (both unfortunately a little torn).

In this species vein C of the hind wing is not approximated to SC to much more than one-third of cell; in *caradrinoides* Guen., Spec. Gén. Lép., vii, p. 296, 1852, Java, the type of *Bocula*, the two veins are approximated to near middle of cell and there does not appear to be any real anastomosis at all. There are also one or two other (less important) differences between *caradrinoides* and *divergens*; but the latter so strongly resembles some *Bocula* species that I have not hesitated to place it in that genus. The above comparison is made with Indian specimens of *caradrinoides*, the species being unrepresented in Coll: Joicey from Java.

57. *RIVULA BIOCULARIS* Moore.

Rivula biocularis Moore, Proc. Zool. Soc. Lond., 1877, p. 614, Andamans.

Mt. Murud, November—1 ♀.

This ♀ appears to agree with a specimen in Coll. Joicey from Burma, determined by Sir G. Hampson as *biocularis*, though very doubtfully with specimens from Ceylon. It is also doubtful whether it agrees with Moore's type; but as the species stands at present this must be catalogued as *biocularis*, which is represented in Coll. Brit. Mus. from India, Ceylon, Andamans, and Sarawak. Also from Burma in Coll. Joicey.

58. *PANILLA* species.

Mt. Poi, 200 feet—1 ♀.

This ♀, which agrees well in most structural points with *dispila*, *Homoptera dispila* Wlkr., Spec. Lep. Ins., xxxiii, p. 890, 1865 (hab. ign.), the type of *Panilla*, appears to be new to science, but it is unfortunately not in sufficiently fresh condition to be described as new, especially in the absence of the ♂.

59. *ZIGERA ALMANA* Swinh. ♂.

Diomea almana Swinh., Ann. Mag. Nat. Hist. (7), viii, p. 499, 1901, Sarawak. (♀).

Lio Matu—1 ♂ ne-allotype.

This species seems to have been previously known from the ♀ only; Coll. Brit. Mus. has 2 ♀, the type and one from Singapore; in Coll. Joicey there is a single ♀ from Bidi, Sarawak.

The ♂ antenna is pectinated to just beyond middle, the pectinations being clothed with fine short bristles or stout hairs, the proximal pectinations five or six times diameter of shaft; termen of fore wing distinctly more oblique than in the ♀; both wings with a little more dark irroration. Otherwise agrees well with the ♀.

60. *CHILCASA FALCATA* Swinh.

Chilcasa falcata Swinh., Proc. Zool. Soc. Lond., 1885, p. 854, Bombay.

Summit of Mt. Murud, 7200 feet, November—1 ♀.

An Indian species, known also from Singapore and the Malay Peninsula.

61. *HAMODES PROPITIA* Guen.

Ophiusa propitia Guen., Voy. de la Coquille, tom. ii, p. 285, pl. xix, fig. 6, 1838, New Ireland.

Bakong—1 ♀.

A common species, widely distributed from India to New Guinea. Not personally known to me from New Ireland, but considering its wide distribution there seems no reason to question the identification, though there may well be some racial variation which has not yet been detected.

62. *OLULIS MURUDENSIS* sp. n.

♀ 28 mm.

Pro- and metathorax with distinct crests; R³ and M¹ of hind wing not stalked. The palpus is wanting.

Head and thorax pale greenish-brown; abdomen buff, paler beneath. *Fore wing* pale straw-colour tinged with olive-green, especially on medial area, on distal edge of postmedial line and on the veins; oblique pale subbasal and antemedial streaks from costa to SC, the latter followed by a green mark on costa and a short black horizontal dash behind C; medial line pale, distally dark-edged, obliquely curved, from two-fifths costa to near base of hind margin; reniform a proximally pale-edged dark lunule with rounded pale patch beyond it;

postmedial line pale, minutely dentate, distally edged by dark lunules, strongly excurved round cell and incurved in fold, where the dark lunule is thickened; subterminal line distally edged with pale olive-green, bent outwards behind R^2 where it is connected with the termen by an olive-green bar; marginal black lunules very sharply defined. *Hind wing* dull pink, except fringe and a patch on proximal two-thirds of wing from costa to middle of cell and R^1 , which are ochraceous-white. *Underside* very pale buff, the fore wing largely suffused with dull pink except at termen; both wings with discal spot and waved postmedial line.

Mt. Murud, November, without exact elevation—1 ♀.

Not a true *Olulis* (see thoracic crests); in reality nearest to *Marapana olivescens* Hampsn., Journ. Bombay Soc., xvii, p. 673, 1907, Ceylon, which Hampson has now placed in a MS genus. But as *murudensis* has little in common with *Marapana* and appears much nearer to *Olulis* I have placed it in the latter genus to avoid confusion with the MSS genus of Hampson.

63. MARAPANA INCONGRUALIS Wlkr. *carneipennis* subsp. n.

♂, ♀ 27--28 mm.

Differs from typical *incongrualis*, *Hypena incongrualis* Wlkr., Spec. Lep. Ins., xvi, p. 232, 1898, Ceylon, on the *fore wing* in having the subsidiary lines less well-developed (especially in the ♂), leaving the pink antemedial, postmedial and subterminal lines, the two black discal dots, the black marginal spots and the horizontal pink streaks towards termen the only distinct markings, and even these are weak. On the *hind wing* var. *carneipennis* differs from the type-form in the weaker fuscous shading on proximal half, which leaves the pink ground-colour much more noticeable. The *underside* of fore wing is also much pinker than in Ceylon specimens, the fuscous shade being confined to the discal lunule, a diffused postmedial line and a patch on terminal area, not reaching to costa; the fringe is, however, slightly more darkened at the veins in Saravak and Malayan specimens. On the hind wing the fuscous shading is confined to the discal spot and the anterior half of fringe, the wing itself being ochraceous-whitish, with pink postmedial line and subterminal shade, the latter almost divided into a double line.

Mt. Dulit, 3000 feet—1 ♂. There are also before me 2 ♀ from Kedah Peak, 3200 feet, December, 1915, submitted to us by the Raffles Museum. A single specimen from Negri Sembilan, previously submitted to us and returned as (probably) merely an aberration of *incongrualis*, evidently from my notes (as well as from the locality) belongs to this subspecies; this last was an extra fine specimen, about 30 mm.

Like the last species, this appears really to belong to a new genus, for which Sir G. Hampson has a name in MSS; but to avoid collision with this MSS name I publish the subspecies under *Marapana*, the genus in which *incongrualis* was placed in the Moths of India, probably the latest generic name employed for it and certainly rather more suitable than *Hypena*.

64. MECODINA HYBRIDA sp. n.

♀ 47 mm.

In size, shape and tone of colour *hybrida* resembles a pale ♀ of *M. albodentata*, *Oglasa albodentata* Swinh., Ann. Mag. Nat. Hist. (6), xv, p. 13, 1895, Khasias, from which it differs in the following particulars. Segment 2 and 3 of palpus both appreciably shorter; fore and hind wing both slightly less sharply angled at middle; medial line bent inward in cell as well as in fold; reniform broader, with a slight line at middle (less distinct); postmedial line more dentate on R³ and M¹; the subapical triangular dark spot *not* followed by a dark streak to the termen; the waved metallic-blue line of *albodentata* replaced by subterminal white spots on the veins, more as in *Psimada quadripennis* Wlkr., Spec. Lep. Ins., xv, p. 1828, 1858, Canara. Similar subterminal white spots on the *hind wing*, followed by a pale buff terminal shade from M¹ to tornus. *Underside* a little greyer than in *albodentata*, with the white marks on costa of fore wing and the dark lines less sharply defined, but the slight pale subterminal spots on the veins as above; both wings with a slight rufous tinge towards costa.

Mt. Murud, November—1 ♀ holotype. A damaged ♀ in Coll. Joicey from S.W. Sumatra, North Korintji Valley, 5000 feet, September--October, 1921 (C., F. & J. Pratt), seems to match the type of *hybrida*.

This species forms somewhat of a link between *albodentata* and *quadripennis*, which Sir G. Hampson retains in separate genera, apparently on the strength of a not-very-apparent difference in the scaling of segment 2 of palpus. As a matter

of fact *albodentata* and *hybrida* agree with *Psimada* in almost as many points as with *lanceola* Guen., Spec. Gén. Lép., vii, p. 373, 1852, Silhet, the type of *Mecodina* Guen.

65. PANGRAPTA HYLAXALIS Wlkr.

Egnasia hylaxalis Wlkr., Spec. Lep. Ins., xvi, p. 222, 1858, Sarawak.

Mt. Murud, November, without elevation—1 ♀.

A fine, large specimen (36 mm.), with the tawny shades on thorax and base of fore wing a little extra bright and with a very conspicuous white belt on dorsum of abdomen at distal end of segment 2. On the underside the dark shading proximally to the reniform and the pale oblique bar from apex of fore wing are wanting; the discal spot on hind wing is unusually broad. These differences are probably only aberrational, though it is possible this may prove to be a constant high altitude form.

There is one ♂ from Java in Coll. Brit. Mus.; otherwise *hylaxalis* is known to me from Sarawak only, where it is apparently not common.

66. GRACILLINA PROSTHENIA Hmps.

Gracillina prosthena Hmps., Entom., lvii, p. 182, 1824, Singapore.

Mt. Penrissen, 2000 feet—1 ♂.

Described from a single ♂ from Singapore. Also in Coll. Joicey from Sungei Ujong and Sarawak. Apparently not a common insect.

67. THROANA CALLISTA sp. n.

♂ 30 mm.

In coloration and markings somewhat recalls *amyntoralis* Wlkr., Spec. Lep. Ins., xvi, p. 225, 1858, Sarawak, the type of *Throana*, but is altogether a more striking and handsome insect. The 2nd and 3rd segments of palpus are both rather longer than in *amyntoralis*; fore and hind wings rather longer and narrower, even more acutely angled at middle (especially fore wing) with fringes apparently rather more highly dentate.

Proximal half of fore wing and third of hind wing slightly paler violet-grey than in *amyntoralis*; Walker, in his description, omits to mention these pale areas, speaking only of the subapical pale patch on fore wing; the dark markings are chocolate-brown, strongly contrasting (not "testaceous"), on fore wing forming a distinct triangular patch on costa

proximally to the pale subapical patch. On the *hind wing* there is a distinct pale subterminal, in addition to the pale postmedial line; the yellowish-white "cuneiform" marks between these lines stand out more sharply; the postmedial is more oblique to hind margin than in *amyntoralis*. *Underside* slate-purple, except a pale grey area at and behind costa of fore wing, with bright brown shading about middle and towards tornus of wings, antemedial and medial line, subterminal on fore wing and fringes dark brown; a double, whitish, interrupted postmedial line and pale terminal spots on both wings; pale subterminal lunules on hind wing. Much darker and more contrasted than *amyntoralis*.

Mt. Penrissen, 4400 feet—1 ♂.

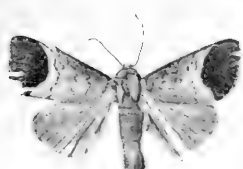
Note.—Four or five species belonging to the above subfamilies are held over and will, it is hoped, be published in a subsequent paper, together with the *Hypeninae*, in which subfamily these collections are somewhat rich.

Explanation of Plate 8.

NOCTUIDAE.

- Fig. 2. *Bocula divergens*.
 ,, 3. *Trachea isoscelata*.
 ,, 4. *Trachea emphanes*.
 ,, 8. *Stictoptera poiensis*.
 ,, 9. *Carea elaeospila*.
 ,, 10. *Olulis murudensis*.
 ,, 12. *Throana callista*.
 ,, 14. *Toanopsis engenes*.
 ,, 15. *Oruza dasycara*.
 ,, 16. *Earias mjobergi*.
 ,, 20. *Sypna rho-latinum*.
 ,, 21. *Sypna anisomeris*.
 ,, 22. *Mecodina hybrida*.
 ,, 24. *Sypna subrotunda*.
 ,, 28. *Dipthera mjobergi*.
 ,, 42. *Hylophilodes dubia*.
 ,, 45. *Enispa oligochra*.
 ,, 47. *Eriopus concinna*.

All are types of ♂ names by A. E. Prout except figs. 22 and 42 which are ♀.



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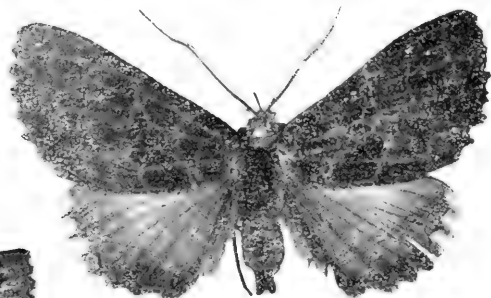
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Vol. III. (Part III.)

No. 10.

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In Memoriam.

JOHN CONEY MOULTON

O.B.E., D.SC., M.A. OXON.)

Curator, Sarawak Museum

1909--1916.

Editor Sarawak Museum Journal.

Died 6th June, 1926.

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XIV.—Diptera Nematocera from the Mountains of Borneo. By F. W. EDWARDS.

(*With two Plates.*)

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This report is based on two collections made in Sarawak by Dr. E. Mjöberg and sent by him to the British Museum for determination. The first was made on Mts. Murud and Dulit in the latter part of 1922, and received in London in the summer of 1923; the second, from Mts. Poi and Penrissen, was received in April 1924. It appeared desirable to combine the reports on the two collections, in order to give us as good an idea as possible in one paper of the Nematocerous fauna of the island. Thanks to the generosity of the Sarawak Museum the types of all the new species have been retained, as well as examples of some other species which were not previously represented in the British Museum collections. Duplicates, when available, have been returned to the Sarawak Museum.

The collection consisted mainly of Tipulidae, of which there were no less than 89 species represented among just under 200 specimens; of these it has been found necessary to describe 51 as new. Some of the supposed new species may perhaps be found later on to be identical with forms described recently by Alexander from Japan or Formosa, but in the great majority of cases this is unlikely. The result is indeed hardly surprising, considering the little that was previously known about the Cranefly fauna of Borneo, and the strong tendency of members of this family to develop local and endemic species, especially in mountainous regions.

So far as I have been able to discover, the following list includes all the Craneflies hitherto recorded from Borneo, as well as a few unrecorded species which are represented in the British Museum.

- | | |
|--|--|
| 1. <i>Elephantomyia argenteocincta</i> Walk. | 9. <i>Eriocera ornata</i> End. |
| 2. <i>Orimarga borneensis</i> BruL | 10. " <i>pyrrhochroma</i> Walk. |
| 3. <i>Trentepohlia (Mongoma) pennipes</i> O. S. | 11. " <i>rubescens</i> Walk. |
| 4. <i>Eriocera borneana</i> Edw. | 12. " <i>verticalis</i> Wied. |
| 5. " <i>combinata</i> Walk. (<i>diluta</i> Walk.). | 13. <i>Ctenacroscelis pilosulus</i> v. d. W. |
| 6. " <i>infra</i> Walk. | 14. " <i>umbrinus</i> Wied. |
| 7. " <i>lunata</i> Westw. | 15. <i>Tipula cinctipes</i> de Meji. |
| 8. " <i>lunigera</i> Walk. (<i>optabalis</i> Walk.) | 16. " <i>magnicornis</i> End. |
| | 17. " <i>pedata</i> Wied. |
| | 18. " <i>punctifrons</i> Rond. |

Only 7 of these 18 species are represented in the present collections so that the total number of Craneflies now known from Borneo is 100. This of course can only be a small fraction of the number which occurs.

The four Mycetophilidae described here are, I believe, the first members of this family to be recorded from the island.

In regard to the Culicidae, Mr. J. C. Moulton has published (in 13th Report Sarawak Museum, 1925, pp. 46-48) a list of the 92 species known from Borneo. The present collection contained only three species, but it was a surprise to discover that all of these were additions to the Bornean list, two being apparently undescribed.

MYCETOPHILIDAE.

MACROCERA BIFASCIATA sp. n. (Plate 9, fig. 1.)

♂. *Head* brownish ochreous, ocellar spot black, face pale yellow. *Antennae* ochreous, appearing darkened on the apical half owing to the denser pubescence. First flagellar segment about three times as long as the scape, second and third rather shorter, fourth equal to the first, last without long bristly hair. *Palpi* yellow. *Neck* white. *Thorax* uniformly shining black, bristles black. *Abdomen* yellowish with black anical bands on each of tergites 1-5, that on tergite 2 the broadest; segments 6-9 all blackish. *Claspers* with the usual two teeth. *Legs* with the coxae shining black, trochanters and fore and mid femora and tibia ochreous; tarsi dark; hind femora and tibiae blackish brown except at the base and tip. *Wings* as figured. No macrotrichia. Halteres black.

Length of body 8 mm.; wing 5 mm.; antennae 12 mm.

Mt. Penrissen, 4500 feet—1 ♂.

There is a damaged female of this species in the British Museum from Siam (Talum, 18th January, 1920. H. C. Robinson and N. Annandale).

PLATYURA PENRISSENSIS sp. n. (Plate 10, fig. 23.)

♂. *Head* dark brown, ocelli enclosed in a black spot, the middle one small. Antennae with the scape ochreous, flagellum black, the segments cylindrical and about twice as long as broad. Palpi ochreous, the first two segments brownish. *Thorax* brownish ochreous, without markings; mesonotum with short black bristles, very dense over the wing-roots; pleurotergites bare; postnotum not prominent, but with a few small bristles at its tip. Abdomen mostly ochreous, the segments with trident-like apical bands, due to black pigment showing through the integument (the bands might not be visible in a dry specimen). Hypopygium as figured. *Legs* light ochreous, tibiae and tarsi darker, the fine setae arranged in very regular rows; first segment of front tarsi quite one-third longer than the tibiae. *Wings* with a slight yellowish tinge; a brown band just before the tip, extending from R_5 into cell M_1 , and a very distinct brown shade over the tip of Cu_2 . Third costal division about two-thirds as long as the fourth; costa reaching half-way from R_5 to the tip of M_1 , An nearly if not quite reaching the margin (wing slightly damaged in this position). Halteres white.

Length of body 5.5 mm.; wing 4 mm.

Mt. Penrissen, 4500 feet—1 ♂.

This is apparently nearer to *P. flaviventris* Brun. than to any other described Oriental species, differing in the longer front tarsi, etc.

LYGISTORRHINA CINCTICORNIS sp. n. (Plate 9, fig. 2.)

♂. *Head* black. Ocelli distinct and placed on a rather prominent tubercle, middle one small. Eyes large, in contact with the lateral ocelli. Front not sunken as it is in the American species. Antennae yellow, except segments 5--6 and 10--15, which are blackish; flagellar segments as long as broad, except the last (16th), which is nearly three times as long. Proboscis ochreous. *Thorax* brownish ochreous, pleurae with dark brown markings. *Abdomen* dark brown, segments 2--6 each with a narrow basal ring, hypopygium yellowish. *Legs* with the coxae dark brown, the front pair ochreous at the base;

trochanters brownish; femora ochreous, narrowly dark at the base, the hind pair with the apical half black; tibia ochreous, the hind with the tips broadly black; front and middle tarsi brownish, hind tarsi black; first segment of front tarsi nearly twice as long as the tibia. *Wings* yellowish-tinged, with a brown pattern as shown in the figure. Halteres yellow.

Length of body 7.5 mm.; wing 4 mm.; proboscis 2.5 mm.

Mt. Murud, 7000 feet, October—1 ♂.

No very near ally of this species has been described, but a rather similar West African form is represented in the British Museum collection. *L. asiatica* White (Ceylon) is a much smaller species with unmarked wings.

EXECHIA PALLIDULA sp. n. (Plate 10, fig. 24, 25.)

Head brownish ochreous, face pale ochreous. Antennae uniformly brownish ochreous, palpi lighter. *Thorax* uniformly brownish ochreous. Scutellum with two strong black bristles and two smaller ones between them. *Abdomen* with the first tergite dark brown, its posterior border pale ochreous; tergites 2--4 in the ♂ entirely ochreous; in the ♀ tergite 2 ochreous with a dark brown median stripe which is widened in the middle and at the tip, tergite 3 ochreous, tergite 4 blackish, tergite 5 ochreous, with the hind margin dark; tergites 6--7 in the ♂ dark brown, in the ♀ blackish. Hypopygium as figured; ovipositor constructed almost exactly as in *E. pallida* Stan. *Legs* ochreous, tarsi darkened; tibial spines black, rather long. *Wings* with a slight yellowish tinge; *Rs* very slightly curved down at the tip; *r-m* about three times as long as the median fork; tips of M_1 and M_2 not reaching the wing-margin; fork of *Cu* well beyond the base of *Rs*; *Ax* long and straight, almost reaching the margin. Halteres whitish, base of knob darkened.

Length of body 4.5 mm.; wing 4 mm.

Mt. Murud foot, October—1 ♂ 1 ♀ in copula.

This is very closely allied to the European *E. pallida* Stan., even the hypopygial structure being very similar. There appear, however, to be several nearly allied Oriental species of this group; such are *E. basilinea* Brun. and *E. flava* White. The best distinction between these species is perhaps to be found in the shape of the large eighth sternite of the male.

EXECHIA sp. inc.

Mt. Dulit, 3000 feet—1 ♂.

BIBIONIDAE.

DILOPHUS RUBIDUS sp. n.

♂. *Head* black. *Antennae* black, except for the second segment, which is ochreous. Flagellum apparently with eight segments only, first as long as broad, next three broader than long but distinctly separated and forming a sort of club. *Thorax* with the pronotum, scutum and scutellum uniformly red, postnotum and pleurae rather dark brown. Anterior pronotal comb with two groups of four teeth, posterior comb with two teeth at each side, one placed in front of the other, and between these a row of six smaller teeth. *Abdomen* brownish red, darker at the tip. *Legs* with the coxae and trochanters orange, front femora reddish, darker at base and tip, posterior femora dark brown, lighter at the base, tibiae and tarsi black. Proximal comb of front tibiae with three spines in a transverse row, and a fourth more distally placed on the outer side. *Wings* brownish, darker towards costa, stigma a little darker still; all veins about equally dark. Basal section of *Rs* very short, barely a third as long as *r-m*; median fork with a short stalk; *m-cu* almost vertical, not outwardly oblique as in the European species. Halteres black.

Length of body 4 mm.; wing 4 mm.

Mt. Murud, 7000 feet, October—1 ♀.

The allied *D. nigristigma* de Meij. differs in the dark scutellum and the more numerous teeth in the posterior pronotal comb, also in the brighter red posterior femora.

CHIRONOMIDAE.

CULICOIDES GYMNOPTERUS sp. n. (Plate 9, fig. 3; Plate 10, fig. 26.)

♀. *Head* black, antennae and palpi dark brown; eyes just touching. Last five flagellar segments about three-quarters as long as the first eight; first flagellar segment shortly oval, next 7 flask-shaped, but very little enlarged at the base, gradually becoming more elongate. Palpi slender, the antepenultimate segment scarcely enlarged on the inner side. *Thorax* mostly yellowish above; mesonotum dark brown in front; scutellum narrowly dark brown at the sides, postnotum similarly coloured at the sides and apex. Two scutellar bristles, close together. Pleurae largely dark. *Abdomen* dark

brown. Two spermathecae, which are nearly globular, with very short necks. *Legs* dark brown, femora at the tips and tibiae at the base broadly yellow, less so on the front legs; hind tibiae with the basal half yellow and also rather broadly yellow at the tip. *Wings* slightly yellowish-tinged, with dark grey markings as in the figure. Second radial cell narrow and entirely pale, the middle dark band from the costa not quite touching its tip. Macrotrichia of the membrane restricted to less than a dozen at the extreme tip of the wing. Halteres yellowish.

♂. Resembles the female except for the usual sexual differences. Hypopygium as figured.

Length of body 1--2 mm.; wing 1.3 mm.

Mt. Penrissen, 2000 feet—type ♀; 3000 feet—type ♂.

Mt. Murud, 7000 feet—2 ♀.

CULICOIDES sp. inc.

Mt. Penrissen, 4500 feet—1 ♀.

CULICIDAE.

ANOPHELES WATSONI Leic.

Mt. Murud, 7000 feet, October—3 ♀.

MEGARHINUS sp. n.?

Mt. Poi, 5350 feet—1 ♂.

Apparently allied to *M. acaudatus* Leic. differing in having no trace of white on the second segment of the hind tarsi. Unfortunately the specimen is too denuded to describe.

ARMIGERES MJOBERGI sp. n.

♀. Nearly allied to *A. moultoni* Edw. differing as follows:—

Mesonotum with a very distinct margin of broad, curved, pale ochreous scales; these scales extending all round the margin, being most numerous at the sutural angles. *Abdomen* with a rather distinct metallic gloss; lateral white spots smaller, more rounded, and more silvery-white, sternites more extensively black. Black tip on the outer side of the hind femora rather less extensive. Bases of fork-cells level.

Length of body 4--4.5 mm.; wing 3.7--4 mm.

Mt. Murud, 7000 feet, October—3 ♀ (cotypes).

TIPULIDAE.

LIMNOBIINAE.

DICRANOMYIA PENRISSENENSIS sp. n.

♂. *Head* black. Front about half as broad as one eye. Antennae and palpi blackish; flagellar segments short-haired, all about equal in length, rather elongate oval with short necks. *Thorax* uniformly blackish brown. *Abdomen* blackish above, brown beneath. Hypopygium of simple structure; fleshy lobes large; rostrum short, with two short spines, ventral appendages of side pieces short. *Legs* blackish; integument (but not pubescence) of tarsi and tips of tibiae pale. *Wings* strongly iridescent, uniformly smoky brown, with a small darker brown stigma. *Sc* long, ending at about two-thirds of *Rs*; tip of *R*₁, indistinct, turned up sharply at *r*; *Cu*_{1a} just before base of discal cell. Halteres blackish.

Length of body 5 mm.; wing 5.5 mm.

Mt. Penrissen, 4500 feet—1 ♂.

Probably allied to *D. alta* de Meij., but distinguished by the blackish pleurae.

DICRANOMYIA PUNCTULATA de Meji.

Mt. Penrissen, 3000 feet—1 ♂, 3 ♀; 4500 feet—2 ♀.

DICRANOMYIA SORDIDA Brun.

Mt. Murud, head camp, 1 ♀.; 5500--6300 feet—1 ♀; Mt. Poi, 5200 feet—1 ♀.

GERANOMYIA MELANOCEPHALA sp. n.

Head, including mouth parts and antennae black. Eyes narrowly separated. Rostrum about as long as the head and thorax together. Palpi with two distinct segments. *Thorax* and *abdomen* rather light brownish ochreous, somewhat darkened dorsally in one or two specimens. Fleshy claspers of male large; rostrum rather long, with a rather long, pre-apical projection which bears the usual two spines at its tip; these spines are very long, and placed so close together that they appear at first sight as a single spine. Ventral projection of side-pieces short. *Legs* brownish, coxae and bases of femora ochreous. *Wings* clear, except for the small stigma. *Sc* reaching beyond the middle of *Rs*; *r* at the tip of *R*₁.

Length of body 5.5--7 mm.; wing 5--6 mm.

Mt. Penrissen, 4500 feet—1 ♂ (type) 2 ♀; Baram River, September—1 ♂; Mt. Murud, top—1 ♂.

RHIPIDIA PICTIPENNIS sp. n. (Plate 9, fig. 4.)

Resembles *R. rostrifera* Edw. (Malay Peninsula and Sumatra), differing as follows:—First antennal segment entirely dark, contrasting with the pale yellow second segment. Thorax with no trace of a dark median line. Wings with small hyaline spots included in the centres of the four main dark costal spots (see figure). Subcostal cross vein absent. Vein M_2 quite free, not connected with either M_1 or M_4 (Cu_1). In the female the segments of the antennal flagellum are nearly globular and without distinct necks, quite unlike those of most other species of the genus.

Mt. Penrissen, 4500 feet—2 ♂; Mt. Dulit, 3000 feet—1 ♀.

RHIPIDIA GRISEIPENNIS sp. n. (Plate 9, fig. 5.)

♀. *Head* dark brownish. Eyes separated by about the width of two or three facets. Antennae and palpi blackish, structure normal. *Thorax* brownish, praescutal stripes darker brown, not very sharply defined; anterior half of median stripe represented by three dark lines with lighter spaces between them.

Pleurae somewhat darker than the dorsum, but not distinctly striped. *Abdomen* rather dark brown, venter lighter except on the posterior margins of the sternites. *Legs* rather light brownish, femora dark brown except towards the base. *Wings* as figured; the greyish markings very extensive and almost obliterating the lighter areas, especially in cells *M* and *Cu*. Halteres ochreous, base of knob darker.

Length of body 6 mm.; wing 6 mm.

Mt. Penrissen, 4500 feet—1 ♂ (type); Mt. Poi, 5200 feet—4 ♀.

In wing-markings this most nearly resembles *R. demarcata* (Brun.), but the thoracic ornamentation is quite different.

RHIPIDIA DISCRETA sp. n. (Plate 9, fig. 6.)

♀. Resembles *R. griseipennis*, differing as follows:—Middle stripe of praescutum with its anterior half entirely dark. Legs somewhat darker, but the femora more extensively light brownish towards the base. Wings with the ground colour tinged with yellow, the spots darker brown and all distinctly separate, cells *M* and *Cu* largely pale, as shown in figure.

Length of body 10 mm.; wing 10.5 mm.

Mt. Murud, top—1 ♀.

LIBNOTES MEGALOPS sp. n.

Head black. Eyes in contact on the front for a considerable distance in both sexes. Antennae with the scape dark brown, flagellum light brown. Flagellar segments oval, verticils short. Palpi and proboscis dark brown. *Thorax* uniformly ochreous. Abdomen brown, last segment and genitalia more ochreous. Hypopygium small, of the usual simple structure, fleshy claspers small. Ovipositor black beneath at the base, anal valves rather short. *Legs* ochreous, tarsi darker; femora with a narrow but sharply defined pre-apical black ring; tips of tibiae also narrowly black. *Wings* with a slight brownish tinge, veins darker brown; no markings except for a small round brownish stigma. Venation as figured by Alexander for *L. nigricornis*, except that Cu_1a is nearer the middle of the discal cell; the wings are also distinctly broader than in *L. nigricornis*, and Ax is about parallel with An for a short distance at the base. Halteres brownish.

Length of body 8 mm.; wing 8--9 mm.

Kalabit Country, October—1 ♂; Baram River, September—1 ♂; Mt. Murud, 5500--6300 feet—1 ♀.

Differs from *L. nigricornis* Alex., in the distinct femoral ring, and in the points mentioned above.

LIBNOTES STANTONI Edw.

Mt. Dulit, 3000 feet—3 ♂; Mt. Murud, 7000 feet—2 ♂; head camp—3 ♂; Mt. Penrissen, 3000 feet—1 ♂; 4000 feet—2 ♂, 1 ♀.

LIBNOTES LIMPIDA Edw.

Mt. Murud, head camp—3 ♂; Mt. Dulit, 3000 feet—1 ♀.

LIBNOTES IMMACULIPENNIS White. Kuching, 1 ♀.

LIBNOTES (GONIODINEURA) nigriceps v. d. Wulp.

Mt. Penrissen, 3000 feet—2 ♂; Mt. Poi, 5000 feet—1 ♀.

LIMNOBIA CITROFOCALIS sp. n. (Plate 9, fig. 7.)

♂. *Head* orange. Front very broad, fully as broad as one eye. Antennae with the scape yellowish, flagellum dark brown; first six flagellar segments rounded and somewhat enlarged beneath, remainder shortly oval, verticils short. Mouth-parts yellowish, greatly reduced and scarcely projecting beyond the oral opening; palpi composed of a single short segment, hairy apically. *Thorax* only moderately humped.

Prothorax entirely orange. A small orange patch on the front of the praescutum, remainder of the mesonotum wholly shining black, with metallic bluish reflections. Pleurae mostly shining dark brown, but the lower part of the sternopleura and a narrow stripe reaching up from this to the base of the wing yellow. *Abdomen* with tergite 1 dull black, with a narrow shining black basal band; tergite 2 shining blue-black on the basal half, dull black on the apical half; 3--6 entirely dull black; 7 dark basally, black apically; 8 entirely orange. Sternite 1 black; 2 orange basally, black apically; 3--4 orange; 5--6 dark brown; 7 dark basally, orange apically; 8 orange. Hypopygium black; claspers small, two pairs somewhat of the *Dicranomyia* type, but the lower one very small; paramere long and slender. *Legs* with the coxae and trochanters orange, the front femora with the basal half yellow, apically half black; mid and hind femora yellow with black tips; tibiae and tarsi black, but the mid and hind tibiae with a narrow ring at the base. Claws long, with one long and sharp basal tooth. *Wings* strongly infuscated, but with a hyaline transverse band just before the cord; base of cell *R* also hyaline; veins black. *Sc* reaching to just beyond middle of *Rs*; *Sc*₂ near its tips; *Rs* rather long, curved at base; *Cu*_{1a} a little beyond base of the short discal cell. Halteres with black stem and white knob.

Length of body 5 mm.; wing 5--5 mm.

Mt. Dulit, 3000 feet—1 ♂.

A remarkably distinct and beautiful little species, especially noteworthy for its reduced mouthparts, which are less developed than in any other Tipulid known to the writer, although reduction as well as elongation is not unknown in this tribe of flies (cf. *Dicranomyia ventralis* Schum.).

LIMNOBIA MJÖBERGI sp. n.

♂. *Head* black. Eyes in actual contact on the front for a long distance. Antennae brown, flagellum lighter, all but the first few segments elongate oval, verticils rather short. Palpi and proboscis brownish. *Thorax* very strongly humped. Ground colour ochreous. Praescutum with a large round brown patch in the middle posteriorly, from which there extend forwards to the front margin two narrow light brown lines; dark brown patches behind the foveae. Scutum with a pair of large blackish patches. Scutellum dark brown, with an ochreous median line. Postnotum dark brown, sides broadly

ochreous. Pleurae with a distinct but irregular dark brown longitudinal stripe, and below it on the sternopleura a dark brown spot. *Abdomen* ochreous; tergite 1 with a brown spot on each side; tergites 2--6 each with a brown apical band, darkest on 2 and 3. Hypopygium small but of rather complicated structure, the side pieces having large and divided basal lobes extending downwards; fleshy claspers present but small. *Legs* ochreous, tarsi darker, femora with a black ring which leaves the extreme tip brownish; tips of tibiae black. Claws with one small basal tooth. *Wings* with a light ochreous tinge, cells *C* and *Sc* yellowish, veins brown. Stigma small, round, dark brown; a conspicuous dark brown seam over the base of *Rs*, and small dark brown spots on *Sc*₂ and the tip of *Rs*. *Sc* reaching to just beyond apex of *Rs*; *R*₁ turned up at *r*; discal cell widened apically; *Cu*_{1a} placed a little beyond base of discal cell. Halteres ochreous, base of knob darkened.

Length of body about 10 mm.; wing 11.5 mm.

Mt. Dulit, 3000 feet—1 ♂.

Apparently allied to *L. infixa* Walk. (New Guinea to India), but with quite different thoracic coloration.

LIMNOBIA MICROLABIS sp. n. (Plate 10, fig. 27.)

♂. *Head* black. Eyes narrowly separated. *Antennae* and palpi black; flagellar segments shortly oval, short-haired. *Thorax* ochreous; scutum, scutellum, postnotum, and a broad but rather ill-defined stripe across the pleurae rather dark brown. *Abdomen* dark brown, posterior margins of segments narrowly pale. Hypopygium of very unusual structure, the tips of the side pieces being produced into broad flat lobes at the base of which the small claspers are inserted. *Legs* dark brown. *Wings* with a strong uniform brown tinge, stigma hardly darker. *Sc* ending a little before apex to *Rs*; *r* at tip of *R*₁; *Cu*_{1a} just beyond base of discal cell. Halteres dark brown.

Length of body 5 mm.; wing 4.5 mm.

Mt. Penrissen, 4500 feet—1 ♂.

STYRINGOMYIA TRANSVERSA sp. n. (Plate 9, fig. 8.)

♀. *Head* mostly ochreous, dark behind, bristles moderately stout and black. *Antennae* with the scape blackish, flagel-

lum almost white. Palpi blackish. *Thorax* with the pronotum ochreous, blackish at the sides. Mesonotum mostly blackish, but with a pair of distinct ochreous lines on the praescutum which diverge somewhat posteriorly but unite across the suture and continue across the scutum. The four main scutal bristles long, stout and somewhat flattened, though less so than in *S. armata*; scutellar bristles small and slender. Several small discal bristles, rather widely spaced. Pleurae blackish on the upper half, pale ochreous on the lower half. *Abdomen* wholly blackish above, brown-ochreous below; seventh sternite with V-shaped emargination at the tip, the corners produced into long finger-like processes which are slightly swollen apically. *Legs* with the coxae and trochanters whitish-ochreous; femora ochreous, each with three dark rings, the basal one faint, the next two conspicuous, extreme tip also somewhat darkened. Tibiae all ochreous, with the usual two blackish rings, one before the middle and one at the tip. Tarsi ochreous, the tips of the first four and the whole of the fifth segment black. *Wings* with the whole membrane greyish, with darker clouds in the usual positions; veins all dark except the costa, which is all yellow. $R_2 +_3$ unusually short and almost vertical; *Ax* without spur. Halteres blackish.

Length of body 6.3 mm.; wing 4.8 mm.

Mt. Penrissen, 4500 feet—1 ♀.

STYRINGOMYIA BORNEANA sp. n. (Plate 10, figs. 28, 29.)

Closely related to *S. javana* Edw., *S. himalayana* Edw., and *S. fryeri* Edw., but differing from all these in details of genital structure (see figure). Head bristles yellow, as in *S. javana*, but the tips of all the veins distinctly darkened, as in *S. fryeri*; tip of *Ax* conspicuously blackened, but not bent backwards. Cell M_1 rather broadly sessile. Discal bristles of praescutum 4+2, each group enclosed in a dark spot. Scutal and scutellar bristles moderately long but not flattened. Abdominal tergites of ♂ with apical dark marks only.

Mt. Murud, 6000--7000 feet—1 ♂ 1 ♀ (types); 7000 feet—1 ♀.

STYRINGOMYIA FLAVA Brun.

Mt. Murud, 5500--6300 feet—1 ♀; Mt. Penrissen, 2000 feet—1 ♂.

STYRINGOMYIA ARMATA var. *acuta* var. n.

Differs from the type from the Philippine Islands as follows : The two spines on the terminal processes of the side pieces of the hypopygium are much less powerful and more sharply pointed, the lower spine shorter and thinner than the upper ; the process of the side-piece is not at all bifid apically as it is in the type of *S. armata*. Cell M_1 just sessile, not stalked.

Mt. Dulit, 3000 feet, January—1 ♂.

TEUCHOLABIS PAHANGENSIS Edw. M.S.*

Mt. Dulit, 3000 feet, January—1 ♂.

ATARBA ARGENTATA Edwards M.S.*

Mt. Murud, 7000 feet, October—1 ♀.

ATARBA FASCIATA sp. n.

Closely allied to *A. javanica* Alex. and *A. argentata* Edw., differing from the latter as follows : Abdominal tergites with the basal half ochreous, the apical half dark brown. Wings with the veins of the cord and the apex of the discal cell slightly but distinctly darkened. *Sc* shorter, ending much before the middle of *Rs*.

Mt. Penrissen, 2000 feet—1 ♀.

ORIMARGA BORNEENSIS Brun.

Kalabit Country, October—2 ♀.

HELIUS (EURHAMPHIDIA) MIRUS sp. n.

♀. Whole body, including the appendages, ochreous ; legs and halteres rather lighter. Rostrum as long as the head. Flagellar segments almost cylindrical, barely twice as long as broad, verticils nearly twice as long as the segments. *Wings* almost hyaline ; a faint grey transverse band at the cord, including the darker stigma ; tip broadly greyish. *Rs* quite twice as long as R_{2+3} ; $r-m$ obliterated, the discal cell being in

* Descriptions of these species will shortly appear in a report on the collections of the Malay States Museum, Kuala Lumpur.

contact with *Rs* for a short distance at two-thirds of the length of *Rs*; cell M_1 very narrow at the base; Cu_{1a} just before the middle of the large discal cell.

Length of body 5 mm.; wing 5 mm.

Mt. Murud; head camp—1 ♀.

HELIUS (*EURHAMPHIDIA*) *NIVEITARSIS* Skuse.

Mt. Penrissen, 4500 feet—1 ♀.

HELIUS *NIGRICEPS* Edw.

Mt. Dulit, 3000 feet—1 ♀; Mt. Penrissen, 4500 feet—1 ♀.

HELIUS *PICTUS* sp. n.

♀. *Head* black, but the antennae, proboscis and palpi entirely light yellow. Rostrum barely as long as the head. Flagellar segments rather elongate oval (only the first few remaining). *Thorax* with the ground colour yellow; praescutum broadly dark brown all round the margin; scutum dark brown, yellowish in the middle anteriorly; scutellum and postnotum entirely dark brown; pleurae yellowish, postero-dorsal part dark brown. *Abdomen* yellowish; tergites 2 and 3 dark brown, 4, 5 and 6 with a broad dark brown apical band and a brownish area in the middle of the basal half; 7 mostly dark brown. Cerci long and slender. *Legs* yellow, tips of femora very narrowly black. *Wings* with the ground colour hyaline, with three dark brown bands, one at the arculus, another across the cord, extending basally for some distance along *M* and *Cu*, and the third at the tip. Veins yellow, black in the dark areas. $R_2 +_3$ as long as *Rs*; $r-m$ vertical, well beyond base of $R_4 +_5$; Cu_{1a} just before the middle of the small discal cell. Halteres pale yellow.

Length of body 5.5 mm.; wing 6.5 mm.

Mt. Dulit, 3000 feet, January—2 ♀.

HELIUS *FASCIVENTRIS* sp. n. (Plate 10, fig. 30.)

♂. *Head* black. Eyes separated only by a narrow line. Rostrum about as long as the head, blackish-brown. Palpi

with the first two segments brown, last two ochreous, penultimate swollen and only half as long as the slender terminal segment. Antennae brownish, about as long as the thorax, short-haired; last six segments slender and cylindrical, basal flagellar segments oval. *Thorax* ochreous. *Abdomen* pale ochreous; segment 2 with a dark brown band near the middle, 3-6 each with a dark brown band at the base; 8 and 9 all dark, but hypopygium mostly pale; structure as figured. *Legs* dark brownish, tarsi obscurely whitish towards the tip. *Wings* hyaline, with conspicuous oval stigma; venation almost as in *H. kambangani* de Meij., Cu_1 being beyond the middle of the small discal cell. Halteres dark brown.

Length of body 6.5 mm.; wing 6.5 mm.

Mt. Penrissen, 3000 feet—1 ♂.

The nearest ally of this species is *H. kambangani* de Meij. which differs in its uniformly dark colour and less conspicuous and more elongate stigma.

HELIUS (RHAMPHOLIMNOBIA) RETICULARIS Alex.

Mt. Dulit, 3000 feet—1 ♀; Mt. Penrissen, 3000 feet—1 ♀.
Previously only known from Java.

ELEPHANTOMYIA ARGENTEOCINCTA Walk.

Mt. Murud, 5500--6300 feet—1 ♂; Songei Tutau—1 ♀.

Belongs to the same group as *E. fuscomarginata* End., as do nearly all the Oriental species of the genus. Alexander has recently proposed the subgeneric name *Elephantomyodes* for this group.

ELEPHANTOMYIA NIGRICEPS sp. n.

♂. *Head* black. Front very narrow, the eyes almost touching. Scape of antennae blackish (flagellum broken). Proboscis broken near base. *Thorax* brownish orange, the pronotum dark brown in the middle. *Abdomen* blackish; tergites 3, 4 and 5 each with a narrow yellow ring at the base; hypopygium ochreous. *Legs* with the coxae and trochanters brownish; femora and tibiae darker brown; tarsi with the basal half or rather more of the first segment blackish, remainder white, second and third segments white, fourth somewhat brownish, fifth black. *Wings* hyaline with dark brown veins. Stigma dark brown, filling the apical part of cells Sc and R_1 and reaching back in cell C nearly to the base of Rs . Venation

almost as in *E. fuscomarginata* End., but *Rs* rather shorter and more bent, and the tip of *An* much further from the tip of *Cu*₂. Halteres pale; base of knob dark.

Length of body 7 mm.; 6.5 mm.

Mt. Dulit, 3000 feet, January—1 ♂.

An immature female Mt. Murud, 5500--6300 feet is probably referable to this species, but differs in the absence of the yellow bands on the abdomen, and the distinctly separated eyes. The new form is close to *E. aurantia* (Brun.) and *E. fuscomarginata* End., differing from the former in the colour of the abdomen, from the latter in the venation, and from both in the black instead of yellow head. In *E. aurantia* the front is distinctly broader than it is in the supposed female of *E. nigriceps*.

Another female in the collection of the Malay States Museum from Peninsular Siam is certainly the same species, although the dorsum of the thorax is somewhat darkened.

CERATOCHEILUS MAJUS sp. n.

♀. *Head* black, dusted over with grey. Front nearly as broad as one eye; no corniculus. Antennae black, of the usual structure. Proboscis black, not quite as long as the abdomen. *Thorax* with ochreous ground colour. Praescutum with its anterior end greatly produced; mainly covered by three broad dark brown stripes, the lateral pair confluent anteriorly with the median, leaving the margin and two narrow posterior lines ochreous. Scutum largely covered by a pair of dark brown spots. A brownish stripe along the upper part of the pleurae, in which are included two large darker brown spots; another dark brown spot on the lower part of the sternopleura. *Abdomen* dark brown, the tergites obscurely, the sternites conspicuously ochreous at the base. Ovipositor very long, base ochreous, valves dark. *Legs* dark brown, femora lighter towards the base; trochanters blackish, coxae ochreous. *Wings* slightly brownish, veins indistinctly seamed with darker brown. *R*₂₊₃ rather long and parallel with the tip of *R*₁. *Cu*_{1a} at base of discal cell. Halteres white.

Length of body 8 mm.; proboscis 5 mm.; wing 6.5 mm.

Mt. Murud, head camp, November—1 ♀.

Allied to *C. latifrons* Brun.; differing conspicuously in thoracic coloration, larger size, and longer *R*₂₊₃.

TOXORHINA FASCIATA sp. n.

Head black, strongly dusted with grey. Front rather narrow, parallel-sided for some distance; in the ♂ narrower than in the ♀. Antennae of normal structure; scape light brown; flagellum blackish. Proboscis rather shorter than the abdomen in the ♀ longer in the ♂. Neck very long. *Thorax* with the praescutum only moderately produced forwards, dark brown with the margin ochreous. Scutum, scutellum and postnotum dark brown. Pleurae light ochreous, with a conspicuous dark brown stripe extending from the neck to the base of the abdomen. *Abdomen* dark brown dorsally, tergites 1--7 in the ♀, 2--5 in the ♂, each with a conspicuous ochreous band on the posterior margin; tergites 8 and 9 and practically the whole venter ochreous. Ovipositor moderately long. *Legs* dark brownish, bases of femora higher, coxae and trochanters ochreous. *Wings* hyaline, veins brownish. Discal cell open; cell M_3 not quite so long as its stem; Cu_1a at or immediately before the fork of M . Halteres brownish ochreous.

Length of body ♂ 7.5, ♀ 10 mm.; proboscis ♂ 7.5, ♀ 6 mm.; wing ♂ 6.5 mm.

Mt. Dulit, 3000 feet, January—1 ♀; Mt. Penrissen, 4500 feet—1 ♂.

TOXORHINA TRICHORHYNCHA sp. n.

♀. *Head* ochreous, slightly darker in the middle. Front narrow above the antennae, but widening above, sides divergent. Antennae uniformly blackish, structure normal, rather long. Proboscis as long as the whole body. Neck moderately long, black, the dorsal membrane pale ochreous. *Thorax* with the praescutum only moderately produced forwards, ochreous-brown, with traces of three darker stripes. Postnotum brownish, apparently without median furrow. Pleurae with a dark brown median longitudinal stripe, sharply margined below, longer part pale ochreous. *Abdomen* dark brownish dorsally, the tergites with rather narrow ochreous apical bands; venter ochreous; ovipositor rather shorter than in *T. fasciata*. *Legs* dark brown, except for the ochreous coxae. *Wings* brownish-tinged, with slightly darker seams along the costa and most of the veins. Discal cell open; cell M_3 a little

longer than in its stem; *Cu 1a* well before fork of *M*. Halteres brownish, knobs lighter.

Length of body 10 mm.; proboscis 10 mm.; wing 6.5 mm.
Mt. Poi, 200 feet—1 ♀.

Allied to *T. producta* Edw. Ms. (Malay States), but the praescutum not nearly so much produced.

MOLOPHILUS MURUDANUS sp. n. (Plate 10, fig. 33.)

♂. *Head* dark brown. Antennae with the scape light brown, flagellum dark brown, about as long as the body, segments elongate and somewhat flask-shaped (denuded). Palpi dark brown. *Thorax* and *abdomen* ochreous brown, without definite markings. Hypopygium very elongate, structure as figured. *Legs* brownish. *Wings* denuded; venation normal. Halteres light ochreous.

Length of body 3.5 mm.; wing 4.5 mm.

Mt. Murud, head camp, November—1 ♂.

Apparently nearest to *M. assamansis* Brun., which has quite a different hypopygium.

MOLOPHILUS ALBICEPS sp. n. (Plate 10, fig. 32.)

Head whitish, as is the scape of the antennae; flagellum and palpi black. Antennae short in both sexes; flagellar segments oval. *Thorax* reddish-brown, pleurae somewhat darker; a whitish stripe round the margin of the mesonotum. *Abdomen* in ♂ blackish, hypopygium large and elongate, structure as figured; in ♀ reddish-brown. *Legs* yellow and black; front and middle femora with the basal half brownish, darkening apically, beyond which is a clear yellow ring, tip broadly black; hind femora yellow with two black rings, the first just beyond the middle the second apical; all the tibiae yellow with a black ring before the middle and another at the tip; tarsi black, basal half of first segment yellow. *Wings* with dark hair; venation normal. Halteres white.

Length of body 3-4mm.; wing 3.5 mm.

Mt. Murud, 7000 feet, October—3 ♂, 2 ♀ (cotypes); foot—1 ♂; headquarters—1 ♀.

ERIOPTERA CACUMINIS sp. n. (Plate 10, fig. 31.)

Head light ochreous, darker in the middle. Antennae with the scape and base of flagellum ochreous, the rest dark brown,

structure alike in the two sexes; flagellar segments oval, the terminal one very small. Palpi rather long, black. *Thorax*, *abdomen* and *legs* ochreous, the pleurae and the dorsum of the abdomen rather darker. Male hypopygium as figured. Ovipositor normal. *Wings* with a very slight brownish tinge, veins light brown, except the upper part of the cord, which is dark brown; stigma absent. Hair on veins and fringe moderately long. *Rs* long, fully as long as R_2 ; $r-m$ far beyond the middle of the wing; cell M_3 long, its base slightly outside that of cell R_2 ; *Ax* very long and sinuous. Halteres with whitish stem and black knob.

Length of body 4.5-5.5 mm.; wing 6-5 mm.

Mt. Murud, top—1 ♂ (type), 2 ♀; 7000 feet, October—1 ♂, 1 ♀; headquarters—1 ♀.

This is closely related to *E. nigripalpis* de Meij., differing mainly if not solely in the structure of the male claspers.

ERIOPTERA MURUDENSIS sp. n.

♀. *Head* dark brown in the middle, broadly pale ochreous round the eyes, pubescence black. Antennae with the scape dark brown; first two flagellar segments large and ochreous, the rest oval and dark brown. *Thorax*, *abdomen* and *legs* uniformly brownish ochreous. *Wings* light brownish, the cord and Cu_2 rather conspicuously seamed with dark brown; stigma brownish, not very distinct. Hair on veins long, brownish. *Rs* long, straight, almost as long as R_2 ; $r-m$ well beyond the middle of the wing; cell M_3 long, its base slightly outside that of cell R_2 ; *Ax* very long and conspicuously sinuous. Halteres ochreous.

Length of body 6.5 mm.; wing 5.5 mm.

Mt. Murud, headquarters, October—1 ♀.

The most striking character of this species is the continuation of the dark seam of the cord along the whole of Cu_2 .

ERIOPTERA NIGRIBASIS Edw. MS.*

Mt. Dulit, 3000 feet—1 ♀; Mt. Penrissen, 3000 feet—1 ♀.

* Kuala Lumpur Museum Collection.

ERIOPTERA SUBFUSCA Edw.

Mt. Penrissen, 3000 feet—2 ♂.

ILISIA FENESTRATA de Meij.

Mt. Murud, head camp, November—1 ♂.

EMPEDA GRACILIS de Meij.

Mt. Penrissen, 3000 feet—1 ♀.

EMPEDA POIENIS sp. n.

♀. *Head* ashy-grey. *Antennae* and *palpi* blackish-brown, flagellar segments shortly oval. *Thorax* dull brownish ochreous; scutellum and prothorax rather lighter, but no distinct whitish stripe at the edge of the mesonotum as in *E. gracilis*. *Abdomen* brownish. *Legs* with the coxae and trochanters ochreous, remainder dark brown, without scales.

Wings hyaline; vein light brown; venation as in *E. gracilis*. Knob of halteres darkened.

Length of body 3.5 mm.; wing 3.5 mm.

Mt. Poi, 5200 feet—1 ♀.

This may possibly be a variety of the European *E. nubila* Schum., from which the only obvious distinction is in the darkened knob of the halteres. *E. gracilis* de Meij. is much less closely allied as it has scaly legs.

GONOMYIA (PROGONOMYIA) BRUNNESCENS sp. n. (Plate 10, fig. 36.)

♀. *Head* dark brown above; proboscis, palpi and scape of antennae ochreous; flagellum dark brown, segments elongate oval. *Thorax* with the ground-colour ochreous-brown, praescutum somewhat darker, especially on the anterior ends of the three faintly indicated stripes; scutellum yellowish; postnotum and pleurotergites blackish; a large blackish patch on the anepisternite, and a dark brown patch on the sternopleurite. *Abdomen* brownish, hypopygium as figured. *Legs* rather dark brown. *Wings* with a slight greyish tinge; stigma and a distinct shade across the cord darker. Venation almost as in *G. nigripes* Brun. Halteres whitish.

Length of body 6 mm.; wing 8 mm.

Mt. Murud, head camp, November—1 ♂.

GONOMYIA (s. str.) BRYANTI Alex.

Mt. Murud, head camp, November—1 ♂.

Mt. Penrissen, 2000 feet—1 ♀ ; 3000 feet—1 ♀ .

I am not quite sure of the identification, Alexander's figures not being very satisfactory. The structure of the hypopygium, and especially of the aedoeagus (not figured or described by Alexander) is extremely similar to that of the European *G. dentata* de Meij.

GONOMYIA SYMMETRICA sp. n. (Plate 10, fig. 34, 35.)

♂. *Head* blackish, rostrum brown. *Antennae* and palpi black, flagellar segments slender. *Thorax* with the whole mesonotum dark brownish, pleurae lighter. *Abdomen* brown; hypopygium as figured, the aedoeagus symmetrically constructed, but otherwise of a similar type to that of the *tenella* group. *Legs* blackish, except the coxae and trochanters. *Wings* hyaline, stigma brown, veins all dark. *Sc* ending only a short distance beyond base of *Rs*, *Sc*₂ near its tip. *Rs* nearly straight and moderately long; *R*₂+₃ scarcely arched; *R*₂ nearly half as long as *R*₃ and not very oblique; *Cu*_{1a} well beyond base of discal cell, which is pointed at the base. Halteres pale.

Length of body 3 mm.; wing 3.5 mm.

Mt. Penrissen, 2000 feet—1 ♂.

RHABDOMASTIX FLAVIDULA sp. n. (Plate 10, fig. 37.)

♀. Colour uniformly yellow-ochreous, except for the dark brown palpi and flagellum, and the brownish legs. Flagellar segments oval. Thorax bare; tuberculate pits present. Abdomen almost entirely bare, with rows of fine hairs only on the posterior margins of the tergites. Anterior trochanters slightly elongate, a little over twice as long as broad. Wings with a slightly yellowish tinge, veins mostly pale, venation as figured; *Rs* unusually short for a member of this genus; *R*₂ vertical and without macrotrichia. Arcular cross-vein present.

Length of body 5 mm.; wing 4.8 mm.

Mt. Penrissen, 2000 feet—1 ♀ (type); Kalabit Country, October—1 ♀ .

A rather aberrant species of the genus, which seems to have a good deal in common with the Australian *Horistomyia*.

TRENTEPOHLIA (TRENTEPOHLIA) VENUSTIPENNIS sp. n. (Plate 9, fig. 9.)

♀. Nearly related to *T. ornatipennis* Brun. (India) and *T. festivipennis* Edw. (Malay Peninsula), differing from the former as follows: Ground colour of wings more extensively dark; all the white markings edged with darker brown than the general ground colour; lower half of wing more variegated; two conspicuous white spots alternating with darker patches in the lower basal cell. Cu_1a much nearer to the fork of M than is the base of cell M_1 .

Mt. Dulit, foot—2 ♀.

TRENTEPOHLIA (PLESIOMONGOMA) NIGROPENNATA Edw. MS.*

Mt. Dulit, foot—1 ♀.

TRENTEPOHLIA (MONGOMA) PENNIPES O.S.

Mt. Dulit, foot—2 ♂; Songei Tutau—1 ♂.

TRENTEPOHLIA (MONGOMA) FORTIS sp. n.

♂. *Head* ochreous, with a strong central keel. *Scape* of antennae brownish-ochreous (flagellum missing). *Palpi* and *proboscis* ochreous. *Thorax* uniformly ochreous. *Abdomen* ochreous, with a narrow brown median dorsal line; *claspers* black, of the usual form. *Legs* rather stout, *coxae* and *femora* ochreous; *tips* of the latter rather broadly and conspicuously black; *tibiae* ochreous at the base, gradually shading to black at the tip; *tarsi* dark brown, *hind femora* with only three or four short spines close together at the base beneath. *Wings* rather broad, hyaline, without markings on the membrane; *veins* mostly yellowish, but the tip of Rs , cross-vein r , base of R_2 , and the whole of R_4+5 and Cu black. R_2 long, placed a little beyond r , which is oblique; *discal cell* rather less than twice as long as broad; cell M_1 with its base considerably nearer the base of the *discal cell* than that of cell M_3 ; Cu_1a about half its length beyond the base of the *discal cell*; Cu_2 ending almost in the tip of An . *Halteres* light ochreous.

Length of body 14 mm.; wing 12 mm.

Kalabit Country, October—1 ♂.

A large rather stoutly built species, evidently allied to *T. cariniceps* End. and *T. nigriceps* de Meij. from Sumatra, but quite distinct.

* Kuala Lumpur Museum Collection.

TRENTEPOHLIA (MONGOMA) PARVICELLULA Edw. MS.?*

Mt. Penrissen, 4000 feet—1 ♂.

TRENTEPOHLIA (MONGOMA) SARAWAKENSIS sp. n.

Head black. Eyes narrowly separated above, just contiguous below. Antennae with the first segment of the scape black, second dark brown. Flagellar segments about three times as long as broad; first five or six ochreous, the rest dark brown. Palpi blackish. *Thorax* brownish-ochreous, without distinct markings. *Abdomen* dark brown, lighter beneath. Hypopygium rather short, of normal structure. *Legs* with the femora dark brown, bases and tip ochreous; no spines; tibiae and tarsi entirely dark brown. *Wings* greyish-tinged; costal and subcostal cells ochreous; stigma distinct, brown; *Rs*, *Cu* and the cross-vein rather distinctly seamed with brown. Venation as in *T. pennipes* O.S., except that the bases of cells M_1 and M_3 are almost level. Halteres whitish.

Length of body 6.5-8 mm.; wing 7-8 mm.

Mt. Penrissen, 4500 feet—3 ♂, 2 ♀ (cotypes).

LECTERIA BIPUNCTATA sp. n. (Plate 9, fig. 10.)

♂. *Head* dark brown above, ochreous beneath. Proboscis short, light ochreous. Antennae with the first segment black, second brown, next three ochreous, indistinctly separated and forming a sort of cone, remainder black. Palpi black, apparently consisting of a single segment (no sign of others having been broken off). *Thorax* reddish ochreous, prothorax blackish. Praescutum with indications of three dark brown stripes posteriorly, towards the front with a pair of round black spots, another small dark spot towards each side posteriorly. Scutum mostly dark brown. Postnotum with a small black spot in each basal corner. *Abdomen* elongate, ochreous, the segments with narrow black posterior and lateral borders. *Legs* ochreous, with long erect hair. Femora with a narrow dark brown ring at about three-fourths of their length; tibiae with a broad whitish ring near the base, followed by an equally broad black ring, tip broadly black; tips of tarsal segments blackened. *Wings* as figured; ground-colour hyaline, with numerous brown dots; veins mostly ochreous. Halteres ochreous.

* Kuala Lumpur Museum Collection.

Length of body 23 mm. ; wing 15 mm.

Mt. Dulit, 3000 feet, January—1 ♂.

This is apparently the first species of this interesting genus to be recorded from the Oriental region. It bears a certain amount of resemblance to the African *L. pluriguttata* Alex.; but the leg-markings are distinctive.

CONOSIA IRRORATA Wied.

Kuching—1 ♂, 1 ♀.

EPIPHRAGMA KLOSSI Brun.

Kalabit Country, October—1 ♀.

LIMNOPHILA (DICRANOPHRAGMA) FENESTRATA sp. n. (Plate vi, fig. 11).

Head blackish. *Antennae* with the first segment blackish, next few segments ochreous, rest dark. *Palpi* black. *Thorax* brown, praescutum with three indefinite darker stripes, lighter anteriorly. *Abdomen* dark brown above, venter mostly ochreous, with dark brown sub-apical bands on the sternites. *Legs* yellowish, only the extreme tips of the tibiae and tarsal segments darkened. *Wings* with conspicuous ocellate markings as figured; as in other species of this genus the male wings are broader than those of the female, the hind margin coming almost to a point at the tip of *Ax*. Costal fringe much longer in the male than in the female. *Halteres* ochreous.

Length of body 5--6 mm. ; wing 6.5 mm.

Mt. Murud, head camp, November—1 ♂ (type), 2 ♀.

In its wing-markings this species is remarkably distinct from other members of the subgenus, and has a strong superficial resemblance to *Ilisia fenestrata* de Meij.

LIMNOPHILA (DICRANOPHRAGMA) MACULITHORAX sp. n. (Plate 9, fig. 12).

♀. *Head* brown, lighter above the antennae. *Rostrum* and *palpi* dark brown. *Antennae* with the scape pale ochreous, first five or six flagellar segments somewhat rounded, white, the rest very slender, brownish. *Thorax* with the ground colour ochreous, rather elaborately spotted with brown. *Praescutum* with three small brown marks on the front margin, another pair over the foveae; a pair of dumb-bell-shaped marks

along the interspaces, and a smaller pair of marks between these and the lateral margin. Scutum, scutellum and postnotum mostly dark brown. Pleurae with a rather narrow brown stripe along the middle; a pair of brown spots above this stripe and another pair below it. *Abdomen* dark brown. *Legs* yellowish; femora with a narrow dark subapical ring, the tip beyond this almost white. *Wings* as figured. Halteres whitish, base of knob darkened.

Length of body 6.5 mm.; wing 6 mm.

Mt. Penrissen, 3000 feet—2 ♀.

In its wing-markings this species resembles *D. interrupta* Brun. (India) and *D. formosa* Alex. (Formosa) but neither of these have any special ornamentation on the thorax.

LIMNOPHILA (DICRANOPHRAGMA) PALLIDITHORAX sp. n. (Plate 9, fig. 13; Plate 10, fig. 39.)

Head blackish. Proboscis and palpi black. Antennae with the first segment black, second and third pale ochreous, rest dark brown. Flagellum short-haired, all segments except the first one or two rather elongate oval. *Thorax* pale ochreous; anterior ends of praescutal stripes and two spots on each lateral margin of the praescutum dark brown, more distinct in the male. Pleurae with a rather indistinct longitudinal brown stripe. *Abdomen* brownish, genitalia lighter, male claspers as figured. *Legs* almost uniformly ochreous, slender. *Wings* as figured; basal cells with a rather variable number of small dark spots, but no dark cloud as in the last two species. Veins mostly pale. Halteres pale ochreous.

Length of body 4.5--5.5 mm.; wing 6 mm.

Mt. Penrissen, 4000 feet—1 ♂ (type); 3000 feet—1 ♀; 2000 feet—1 ♀.

LIMNOPHILA (EPHELIA) GRANULATA sp. n. (Plate 9, fig. 17; Plate 10, fig. 38.)

Head black. Palpi and scape of antennae black. Flagellum with the first five or six segments pale ochreous, enlarged beneath, not longer than broad; remaining segments shortly cylindrical, somewhat darkened, slightly longer in the male than in the female, verticils two or three times as long as the segments. *Thorax* brownish, with rather variable darker brown markings; usually two rows of small dots on the praescutal interspaces, a mark along the lateral margin of the praescutum.

scutum behind the fovea, and an indefinite longitudinal stripe on the pleurae; also other obscure mottlings. *Abdomen* dark brown; hypopygium yellowish, tips of side pieces black; claspers as figured. *Legs* yellowish; femora with a dark brown ring at the tip, before which the colour is lighter; proximal end of the ring narrowly blackish. *Wings* rather broad in both sexes, but (as usual) more so in the male, with distinctive markings as shown in the figure; the centres of the larger dark patches (except those on the costal) are lighter brown. Halteres ochreous, base of knob darkened.

Length of body 7 mm.; wing 6 mm.

Mt. Penrissen, 2000 feet—4 ♂, 3 ♀ (cotypes); 3000 feet—1 ♂, 6 ♀.

LIMNOPHILA (EPHELIA) DULITENSIS sp. n. (Plate 9, fig. 16.)

♀. *Head* black. Palpi and scape of antennae black. First four or five segments of flagellum ochreous, slightly darkened at the base above, rounded beneath, the rest slender, nearly cylindrical, brownish; hairs rather longer than the segments. *Thorax* rather dark brownish, praescutum more ochreous in front, markings indistinct; a few dark dots on the praescutal interspaces. *Abdomen* dark brown, ovipositor ochreous. *Legs* yellowish, the tips of the femora with a rather sharply defined dark brown ring, the extreme tip somewhat lighter. *Wings* with dark brown markings as shown in the figure. Costa yellowish in the light areas, other veins darker. Halteres ochreous, base of knob darkened.

Length of body 8 mm.; wing 7 mm.

Mt. Dulit, 3000 feet, January—1 ♀.

Resembles *L. (E.) fascipennis* Brun. in its wing-markings, differing in the structure and colour of the antennae.

LIMNOPHILA (POECHILOSTOLA) GUTTULARIS sp. n. (Plate 9, fig. 14; Plate 10, fig. 40.)

♂. *Head* blackish. Antennae with the first segment blackish, second ochreous brown; base of flagellum composed of small rounded dark brown segments, apical half missing. Palpi black. *Thorax* brownish-ochreous; posterior ends of praescutal stripes, patches behind the foveae, centres of scutal lobes, postnotum and most of pleurae darker brown. *Abdomen* dark brown, sternites largely ochreous. Claspers as figured; penis much shorter than in *L. murudensis*, but still of the

Poecilostola type. *Legs* brownish ochreous, tips of femora slightly darkened, tips of tibiae a little more so. *Wings* with a faint yellowish tinge; markings as in the figure. Halteres broken.

Length of body 7 mm.; wing 7 mm.

Mt. Murud, head camp, November—1 ♂.

The species has a strong superficial resemblance to *L. (Dicranophragma) pallidithorax* sp. n., owing to the similarity of the wing-markings.

LIMNOPHILA (POECILOSTOLA) MURUDENSIS sp. n. (Plate 9, fig. 15; Plate 10, fig. 41.)

♂. *Head* dark brown, lighter beneath. *Antennae* with the scape blackish, flagellum dark brown except for the first segment, which is more ochreous; first three or four flagellar segments rounded, rest gradually becoming more slender, verticils not much longer than the segments. *Palpi* blackish. *Thorax* brownish ochreous, without definite markings; scutum, scutellum and postnotum darker brown. *Abdomen* brown, sternites with ochreous basal bands; hypopygium yellow, structure as figured. *Legs* yellow; femora with a very narrow and indistinct ring some distance before the tip. *Tips of tibiae* conspicuously black, tips of tarsal segments also darkened. *Wings* slightly yellowish, with light brown markings as in the figure; costa, subcosta and R_1 yellow. Halteres yellowish.

Length of body 8 mm.; wing 8 mm.

Mt. Murud, head camp, November—2 ♂.

LIMNOPHILA (PILARIA) MELANOTA Alex.?

Mt. Penrissen, 3000 feet—1 ♂.

The specimen answers to Alexander's description, the type of which was from Gifu, Japan. Hypopygium constructed as in the European *L. discicollis* Mg. Flagellar segments with long pubescence about twice as long as the diameter of the segments, and each with one long dorsal hair, about as long as the segment.

LIMNOPHILA (PSEUDOLIMNOPHILA) PALMERI Alex.?

Mt. Poi, 5000 feet—1 ♀.

LIMNOPHILA (TROGLOPHILA) ALTICOLA sp. n. (Plate 9, fig. 18.)

♂. *Head* rather light ochreous. *Eyes* large, separated above by little more than the width of one facet, but much more widely separated below the mouth parts. *Antennal scape* yel-

lowish, very short. Flagellum blackish, longer than the body, first segment the longest, the others gradually decreasing in length, clothed with extremely long pubescence, mixed with some shorter hairs. Palpi dark brown, first segment short, second a little over twice as long as broad, third more slender and nearly twice as long as the second, fourth still more slender and half as long again as the third. *Thorax* short and rounded, ochreous-brown above, pleurae paler; apparently no tuberculate pits. *Abdomen* brownish; claspers as figured; penis and parameres short. *Legs* with the coxae and trochanters pale ochreous, remainder dark brown; spurs minute. *Wings* slightly greyish, unmarked, venation as figured; posterior fringe long; all the veins with rather long macrotrichia. Halteres ochreous.

Length of body 4 mm.; antennae, 5.5 mm.; wing 4.5 mm.

Mt. Penrissen, 4000 feet—1 ♂.

Apparently nearly allied to the type of the subgenus (*L. cavernicola* Brun. of Assam), differing in the longer *Sc* and the position of *Cu 1a* just at the base of the discal cell. The hypopygial structure suggests a possible relationship with *L. nemorialis* Mg. and allied species.

ERIOCERA VERTICALIS Weid.

Baram River, September—4 ♂.

ERIOCERA SUBPAENULATA sp. n.

♂. *Head* black. Front moderately broad, without tubercle. Antennae blackish, the base of the first flagellar segment ochreous; sixth (last) flagellar segment very short. Palpi blackish. *Thorax* dorsally blackish-brown, somewhat dusted with grey; a single small dull blackish spot on the scutum immediately above the root of each wing; Pleurae mostly ochreous, a dark brown spot on the lower part of the sternopleura, another on the anepisternite, and a third at the base of the halteres. *Abdomen* dark brown dorsally, with obscure ochreous bands beyond the middle of segment 2 and at the bases of segments 3 and 4; venter and hypopygium ochreous. *Legs* dark brown, coxae, trochanters and bases of femora ochreous. *Wings* smoky, stigma darker, rather conspicuous; venation as in *E. paenulata* End., except that *r—m* is placed just at the fork of *Rs*. Halteres blackish, base of stem ochreous.

Length of body 8.5 mm.; wing 11 mm.

ERIOCERA MURUDENSIS sp. n. (Plate 9, fig. 19.)

♂. *Head* blackish brown, frontal tubercle scarcely indicated. *Antennae* longer than the head and thorax together; first segment blackish, remainder brownish-ochreous; first two segments of flagellum together longer than the remaining four; last very short. *Palpi* dark brown. *Thorax* dark brown, unmarked, not conspicuously hairy. *Abdomen* rather short and stout, dark brown, slightly and uniformly shining. *Legs* moderately stout, dark brown except for the yellow bases of the femora. *Wings* rather smoky; a large white spot over the outer ends of the basal cells, and several smaller yellowish spots, as shown in the figure. *Halteres* dark brown.

Length of body 8.5 mm.; wing 9 mm.

Mt. Murud, head camp, November—1 ♂.

This is perhaps nearer to *E. decorata* Brun. than to any other previously described species, but differs in the position of r well beyond the fork of $R_2 +_3$, and in the wing-markings.

CYLINDROTOMINAE.

STIBADOCERA METALLICA var. *fasciata* n.

♂. Closely allied to *S. metallica* Alex. (Java), differing chiefly as follows:—*Antennae* with first flagellar segment ochreous. *Prothorax*, *coxae*, and first abdominal segment clear yellow; segments 3--5 of the abdomen with distinct ochreous bands at the base.

Length of body 8 mm.; wing 8.5 mm.; antennae 12.5 mm.

Mt. Murud, head camp, November—1 ♂.

STIBADOCERELLA ALBITARSIS de Meij.

Mt. Murud, 6000--7000 feet—1 ♂.

TIPULINAE.

NESOPEZA PERPULCHRA sp. n. (Plate 9, fig. 22.)

♂. *Head* dark ochreous brown. *Antennae* a little longer than the head and thorax together; *scape* light ochreous; *flagellum* brown, ringed with ochreous at the joints; first flagellar segment about twice as long as the second, next four or five about equal in length, the rest gradually shorter. *Palpi* dark brown. *Thorax* dark ochreous brown, unmarked. *Abdomen* ochreous brown, the segments with obscurely darker bands before the middle and at the tip. *Hypopygium* small, *claspers* rather short and broad. *Legs* with the *coxae* dark

brown, trochanters ochreous, femora and tibiae brownish with the tips slightly darkened, tarsi wholly pale ochreous. *Wings* with a beautiful pattern of dark and light brown, with narrow lines, as shown in the figure. Halteres ochreous, knob somewhat darkened.

Length of body 10 mm.; wing 11 mm.

Mt. Murud, head camp, November—1 ♂ (type); October—1 ♂.

NESOPEZA GRACILIS (de Meij.).

Mt. Murud, head camp, October—1 ♀.

Agrees with de Meijere's description and figure in most respects but is rather larger (body and wing length 11 mm.).

NESOPEZA GRACILIS var. *major* vr. n.

Differs from typical *N. gracilis* as follows:—Femora with the tips only very indistinctly darkened. No trace of a dark cloud over Cu_1a . Size larger; body and wing-length about 14 mm.

In the ♂ the cell M_1 is very long, with an extremely short stalk. Hypopygium small; ninth tergite with a pair of blunt sub-lateral blackened processes, and a small sharp median black tooth. Outer claspers very small and thumb-like, pale in colour.

Mt. Murud, 5500-6300 feet, November—1 ♂, 1 ♀ in cop.

NESOPEZA COSTALIS var. *borneensis* sp. n.

Differs from typical *N. costalis* Brun. (from S. India) as follows:—*Proboscis* blackish. *Wings* without any trace of darkening over Cu_1a or at the tips of any of the veins on the posterior margin of the wing. Length of body 10 mm.; wing 9 mm.

Mt. Penrissen, 4500 feet—1 ♀.

Although much resembling *N. gracilis*, *N. costalis* is certainly quite distinct on account of the much shorter cell M_1 and the absence of dark markings on the pleurae. It is possible that the Bornean form is really specifically distinct from the Indian.

DOLICHOPEZA PALLIDITHORAX de Meij.?

Mt. Penrissen, 3000 feet—1 ♂ (immature).

Alexander would place this and allied species in *Nesopeza*, on account of the rather long *Rs*, but it would seem to me better confine *Nesopeza* to the species with ornate wings.

DOLICHOPEZA CUNEATA sp. n. (Plate 9, fig. 21; Plate 10, fig. 42.)

Head ochreous, somewhat darker behind. Frontal tubercle scarcely indicated. Rostrum extremely short, with some dark hair but without nasus. Antennae brown, only the second segment ochreous; in the ♂ almost as long as the head and thorax together, in the ♀ a little shorter than the thorax. *Palpi* very long, ochreous, darkened in the middle and at the extreme tip. *Thorax* uniformly ochreous brown. *Abdomen* long and very slender, dark brown, with narrow greyish-ochreous rings beyond the middle of segment 2 and before the middle of each of segments 3-7. Hypopygium rather large, ochreous, black at the tip, structure as figured. Female cerci rather long, straight, bluntly rounded at the tip. *Legs* with the coxae ochreous, femora dark brown; tibiae brown, narrowly white at the base; tarsi mainly white, but the first segment on the front legs dark except at the base and tip, on the middle legs dark except at the tip, and on the hind legs with a broad dark ring in the middle. *Wings* remarkably narrow and cuneiform, pre-arcular portion rather elongate, axillary cell extremely narrow; colour uniformly greyish except for the dark brown stigma; venation as shown in the figure. Halteres black, very long and slender.

Length of body 10-12 mm.; wing 10.5-11.5 mm.

Mt. Penrissen, 2000 feet—6 ♂ (including type) 4 ♀.

“Dancing up and down between the buttresses of a jungle tree, ‘swimming’ continually with the legs while on the wing.”

Mt. Poi, 200 feet—1 ♂, 1 ♀.

MITOPEZA MJÖBERGI sp. n. (Plate 9, fig. 20; Plate 10, fig. 43, 44.)

Head dark brown. Rostrum extremely short, barely one-sixth as long as the vertical diameter of the eyes. Palpi long, brownish. Antennae with the scape brown, flagellum black; in the ♀ shorter than the thorax, the first flagellar segment about four times, the second and following segments barely twice as long as broad; in the ♂ nearly twice as long as the head and thorax together, flagellum with rather long pubescence on the dorsal surface only, first segment very long, second about half as long, last few segments shorter. *Thorax* brown, unmarked. *Abdomen* dark brown, the segments paler basally. Ovipositor much as in *M. nitidirostris* Edw., but the spermathecal ducts not nearly so long. Hypopygium as figured. *Legs* dark brown. *Wings* brownish tinged, stigma dark

brown, with an indistinct pale area before and beyond it. Venation as figured. Halteres dark.

Length of body 6--7 mm.; wing 7.5--9 mm.

Mt. Penrissen, 3000 feet—1 ♂, 1 ♀.

Differs from the genotype in the open discal cell and shorter antennae.

PSELLIOPHORA STIGMATICA de Meij.

Mt. Penrissen, 2000 feet—1 ♀.

CTENACROSCELIS NOVAE-GUINEAE (de Meij.)?

Kalabit Country, Pah Trap—1 ♀.

CTENACROSCELIS PUNCTIPENNIS sp. n.

♂. *Head* dark brown, lighter behind at the sides, with a narrow ochreous margin to the eyes. *Antennae* 12-segmented, dark brown, second segment ochreous brown; flagellar segments almost cylindrical, each (except the last) a little shorter than the one preceding. *Palpi* dark brown. *Neck* dark brown, with two broad ochreous stripes above. *Thorax* dark brown above, the praescutal stripes somewhat darker than the ground-colour and with a slight greenish tinge. *Pleurae* largely ochreous-brown, the lower half of the pleurotergites conspicuously paler; a whitish stripe below the margin of the mesonotum from the spiracle to the wing base; below this stripe a large ill-defined dark brown patch. *Abdomen* rather dark brown; foveae of second segment large and conspicuous; hypopygium of normal structure, without definite hair tufts; hair on ninth tergite dark; claspers ochreous. *Legs* brownish ochreous; femora with a rather broad blackish pre-apical ring, which on the front legs is preceded by an indistinct ochreous ring. *Wings* rather dark brown, somewhat darker just before the arculus and on the stigma; small pale ochreous patches as follows: over the arculus, before and beyond the stigma, over the cord, just before the fork of *Cu*, below the tip of *An*, and before and behind the tip of *Ax*; also a short pale streak below *An* before the middle. Cell M_1 with short stalk; *m-cu* obliterated. Halteres brownish.

Length of body about 28 mm., wing 36 mm.

Mt. Murud? "November"—1 ♂.

TIPULA (*TIPULODINA*) *MAGNICORNIS* End.?

Mt. Dulit, 3000 feet—1 ♀.

TIPULA (TIPULODINA) CINCTIPES de Meij., var.

♂. *Head* dark brown above, pale ochreous above the insertion of the antennae, the dark colour continued forwards to a point almost to between the bases of the antennae. *Proboscis* short, light above, brownish at the sides. *Antennae* nearly half as long as the wing; scape pale ochreous, flagellum dark brown, bases of segments blackened; a small but distinct, thirteenth segment present. *Palpi* brownish ochreous. *Thorax* ochreous, more brownish dorsally, but without distinct stripes. A small dark dot below the prothoracic spiracle, another above the base of the mid coxae, and a dark streak at the base of the halteres. *Abdomen* brownish, with narrow ochreous bands, almost divided into pairs of spots, beyond the middle of the second and at the bases of the 3rd to 9th tergites. Ninth tergite with its posterior margin almost straight, with short black bristly hair which is aggregated into a pair of small admedian tufts. Upper clasper rather short and broad: lower clasper rather long and slender, tip pointed, blackened, and somewhat curved inwards: a strong, sharp black tooth projecting inwards a little beyond the middle. *Legs* with the coxae and trochanters pale ochreous, hind coxae with a brown patch behind. *Femora* brownish, blackened towards the tips, the front and middle pairs each with a narrow white subapical ring. *Tibiae* blackish, anterior pairs with a narrow subapical white ring, hind pair with narrow subbasal and broad subapical white rings. *Front and middle tarsi* black, becoming brownish towards the tips, hind tarsi with three broad white rings, occupying almost the outer half of the first segment, and the whole of the second and third segments, except for the bases and tips. *Wings* hyaline, stigma black, a small blackish cloud over $r-m$, and a dark brown patch at the tip of the wing, extending from before tip of R_3 to the tip of R_4+5 , and including a whitish triangle in cell R_3 ; tips of M_1 , M_2 and Cu_2 very slightly clouded. *Venation* almost as in *T. magnicornis*, but cell M_1 narrower; cell Ax not very narrow. *Halteres* dark brown, knob lighter.

Length of body 15 mm.; wing 15 mm.; antennae 7 mm.

Mt. Dulit, 3000 feet, January—1 ♂.

Allied to *T. contigua* Brun. and *T. simillima* Brun., especially to the former, but quite distinct.

TIPULA (TIPULODINA) ALBIPRIVATA sp. n. (Plate 10, fig. 45.)

♂. Head blackish, ochreous above the antennae, with very slight frontal tubercle. Proboscis rather short, brownish, nasus distinct. Antennae longer than the head and thorax, scape orange, flagellum black, except the small thirteenth segment, which is dull ochreous. Palpi dark brown, terminal segment mostly ochreous. *Thorax* ochreous, darker dorsally, pronotum and a median line on the praescutum blackish. *Abdomen* ochreous, the tergites with black apical triangles, second tergite also blackish before the middle. Hypopygium as figured. *Legs* with the coxae and trochanters ochreous, femora brownish ochreous, with black tips, tibiae and tarsi black. *Wings* with nearly hyaline ground colour, stigma black; a broad but indistinct brownish shade across the middle of the basal cells; a rather large blackish cloud over $r-m$, another over the base of Cu_1 ; tip of wing broadly brownish, the colour reaching almost back to the stigma, but scarcely noticeable below R_{4+5} . *Rs* about as long as $R_2 +_3$ and about twice R_2 ; R_{4+5} curved down and ending distinctly below the tip of the wing; cell Ax narrow, but not extremely so. Halteres black, tip of the knob pale.

Length of body 17 mm.; wing 18 mm.; antennae 7 mm.

Mt. Dulit, 3000 feet—1 ♂.

Although there are no white rings on the legs, the venation and general appearance suggest a relationship with the *Tipulodina* group.

TIPULA XANTHOMELAENA sp. n.

♀. *Head* ochreous, with a dark brown transverse band on the vertex connecting the eyes. Rostrum ochreous, shorter than the head, nasus long. Antennae scarcely as long as the thorax; scape brownish ochreous; flagellum black, base of first segment ochreous, verticils short, confined to the dorsal side of the segments. Palpi brownish ochreous, last segment lighter. *Thorax* ochreous, with a dark brown but not sharply defined median praescutal stripe, and pair of short, rather indistinct brownish lateral stripes. *Abdomen* rather bright yellow, tergites 2—8 each with a conspicuous black apical band which is slightly widened in the middle; sternites 2, 3 and 4 each with dark brown basal and apical bands, 5--7 all yellow. Ovipositor with the base ochreous, valves dark brown, moderately long and straight. *Legs* with the coxae and femora

ochreous, femora brownish ochreous, apical fourth blackened; tibiae and tarsi dark. *Wings* with a slight brownish tinge, stigma darker brown. *Rs* shorter than R_{2+3} and not much longer than R_2 , which is angulate, *r* joining it at the angle. R_3 and R_{4+5} straight, the latter ending just above Cu_1a not very oblique, in contact with the small discal cell for a short distance. Cell *Ax* rather narrow, of even width throughout. Halteres brownish.

Length of body 10--11 mm.; wing 10.5 mm.

Mt. Dulit, 3000 feet, January—1 ♀.

A small species of rather distinctive colouration, perhaps related to *T. robinsoni* Edw. (Sumatra).

TIPULA QUADRINOTATA Brun.

Mt. Murud, foot—1 ♀; head camp—1 ♀.

The following are probably either synonyms or varieties of this species:—*umbrinoides* Alex. (Java), *shirakii* Edw. (Formosa), *jacobsoni* Edw. (Sumatra), *pseudofulvipennis* de Meij. (Sumatra), *fumifascipennis* Brun. (India), and *fumicosta* Brun. (India).

TIPULA SULAICA Walk. (Plate 10, fig. 46.)

Kuching—1 ♂.

A rather distinct species on account of the structure of the antennal flagellum (see figure). Wing and hypopygium much as in *T. gedehicola* Alex. (Java), but costal cell almost clear (subcostal dark). The specimen agrees rather closely with Walker's type from Sula.

TIPULA WALKERI Brun. (FULVIPENNIS Walk.).

Mt. Poi, 5000 feet—1 ♂.

Superficially similar to the last, but antennae simple, flagellum bicolored, apical lobes of ninth tergite more sharply pointed and more spinulose, costal cell darker, axillary cell broader, with rather definite anal angle.

Explanation of Plate 9.

Wings of Bornean Nematocera, various magnifications.

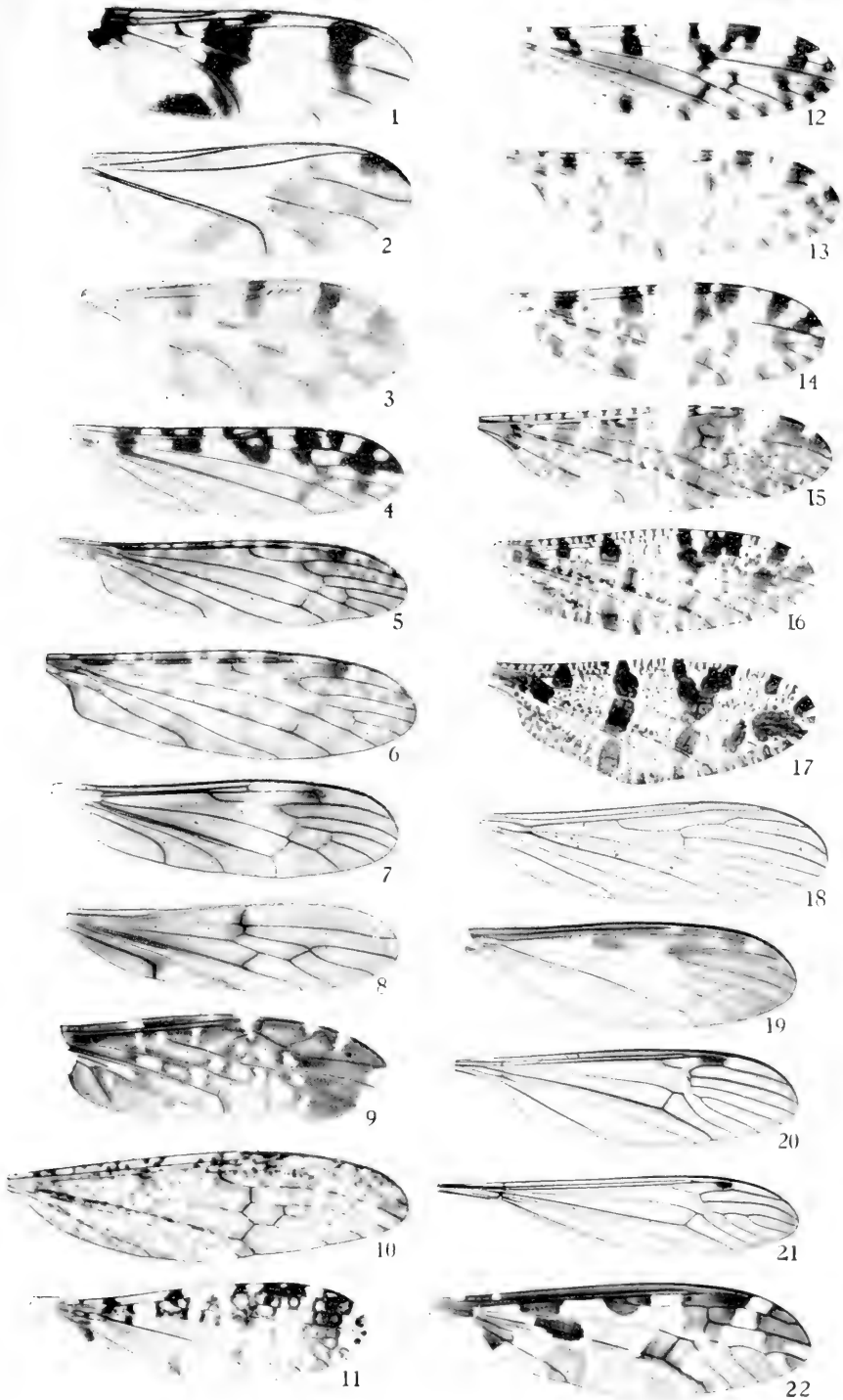
- Fig. 1. *Macrocera bifasciata* sp. n. ♂.
 „ 2. *Lygistorrhina cincticornis* sp. n. ♂.
 „ 3. *Culicoides gymnopterus* sp. n. ♀.
 „ 4. *Rhipidia pictipennis* sp. n. ♂.
 „ 5. „ *griseipennis* sp. n. ♀.
 „ 6. „ *discreta* sp. n. ♀.

- Fig. 7. *Limnobia citrofocalis* sp. n. ♂.
 ,, 8. *Styringomyia transversa* sp. n. ♀.
 ,, 9. *Trentepohila venustipennis* sp. n. ♀.
 ,, 10. *Lecteria bipunctata* sp. n. ♂.
 ,, 11. *Limnophila* (*Dicranophragma*) *fenestrata* sp. n. ♀.
 ,, 12. " " *maculithorax* sp. n. ♀.
 ,, 13. " " *pallidithorax* sp. n. ♂.
 ,, 14. " (*Poecilostola*) *guttularis* sp. n. ♂.
 ,, 15. " " *murudensis* sp. n. ♂.
 ,, 16. " (*Ephelia*) *dulitensis* sp. n. ♀.
 ,, 17. " " *granulata* sp. n. ♂.
 ,, 18. " (*Troglophila*) *monticola* sp. n. ♂.
 ,, 19. *Eriocera murudensis* sp. n. ♂.
 ,, 20. *Mitopeza mjöbergi* sp. n. ♂.
 ,, 21. *Dolichozeza cuneata* sp. n. ♂.
 ,, 22. *Nesopeza perpulchra* sp. n. ♂.

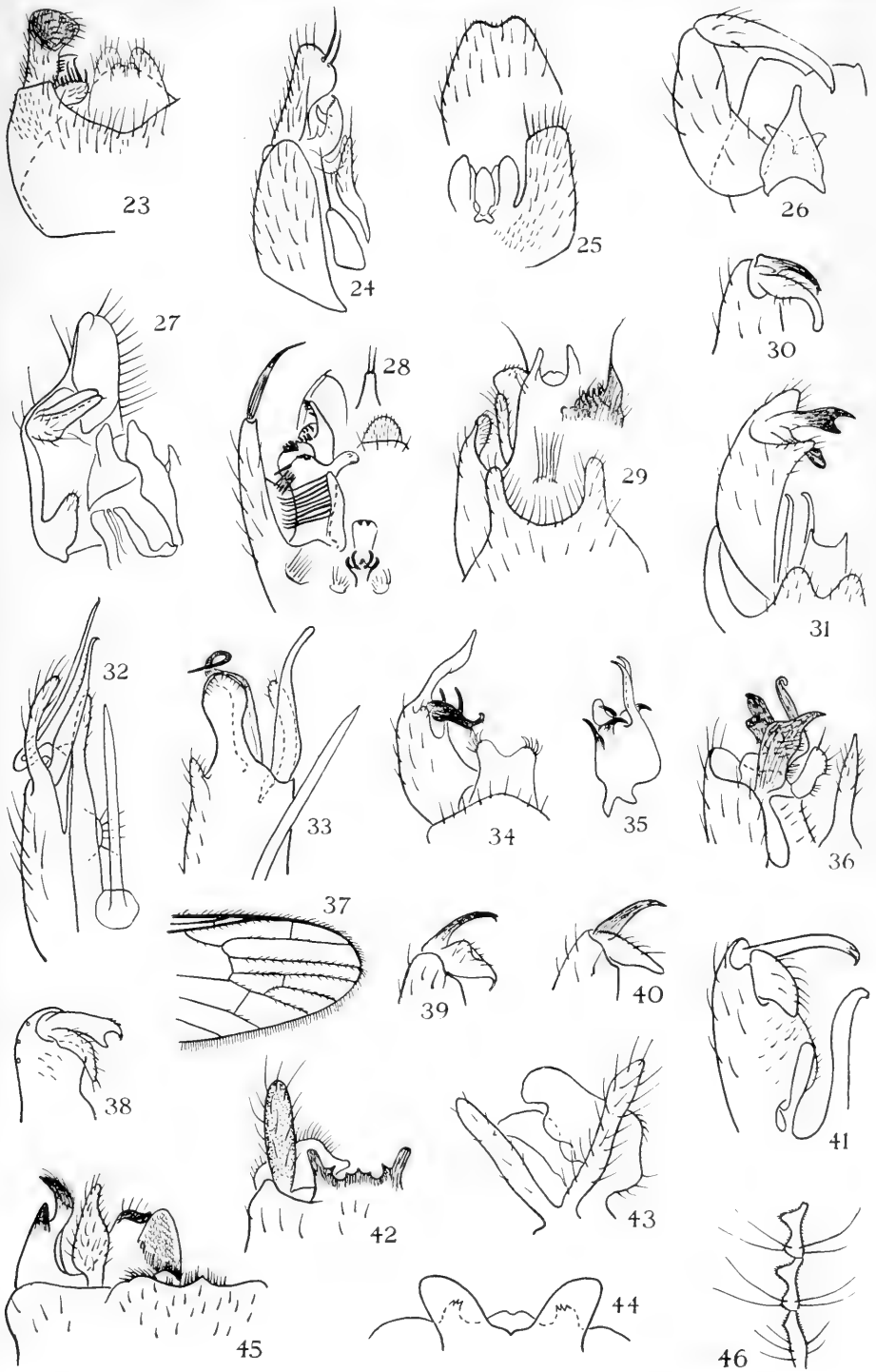
Explanation of Plate 10.

Details of male hypopygia, etc.

- Fig. 23. *Platyura penrissenensis* sp. n. ♂ hypopygium from beneath.
 ,, 24. *Ezechia pallidula* sp. n. ♂ hypopygium from above.
 ,, 25. *Ezechia pallidula* sp. n. ♂ hypopygium from below, also tip of eight sternite.
 ,, 26. *Culicoides gymnopterus* sp. n. ♂ hypopygium from beneath.
 ,, 27. *Limnobia microlabis* sp. n. ♂ hypopygium from beneath.
 ,, 28. *Styringomyia borneana* sp. n. ♂ hypopygium from beneath; tips of ninth tergite and sternite shown separately.
 ,, 29. *Styringomyia borneana* sp. n. tip of ♀ abdomen from beneath; anal cercus shown separately.
 ,, 30. *Helius fasciventris* sp. n. ♂ claspers.
 ,, 31. *Erioptera cacuminis* sp. n. ♂ hypopygium from above.
 ,, 32. *Molophilus albiceps* sp. n. ♂ hypopygium from beneath.
 ,, 33. *Molophilus murudanus* sp. n. ♂ hypopygium, half side view.
 ,, 34. *Gonomyia* (s. str.) *symmetrica* sp. n. ♂ hypopygium from above.
 ,, 35. *Gonomyia symmetrica aedoeagus*, half side view.
 ,, 36. *Gonomyia* (*Progonomyia*) *brunnescens* sp. n. ♂ hypopygium from above.
 ,, 37. *Rhabdomastix flavidula* sp. n. ♂ tip of wing.
 ,, 38. *Limnophila* (*Ephelia*) *granulata* sp. n. ♂ claspers.
 ,, 39. *Limnophila* (*Dicranophragma*) *pallidothorax* sp. n. ♂ claspers.
 ,, 40. *Limnophila* (*Poecilostola*) *guttularis* sp. n. ♂ claspers.
 ,, 41. *Limnophila* (*Poecilostola*) *murudensis* sp. n. ♂ hypopygium from above.
 ,, 42. *Dolichozeza cuneata* sp. n. ♂ hypopygium from above.
 ,, 43. *Mitopeza mjöbergi* sp. n. ♂ claspers from side.
 ,, 44. *Mitopeza mjöbergi* sp. n. ♂ ninth tergite.
 ,, 45. *Tipula albiprivata* sp. n. ♂ hypopygium from above.
 ,, 46. *Tipula sulaica* Walker, basal segments of antennal flagellum.



DIPTERA NEMATOCERA.



DIPTERA NEMATOCERA.

XV.—Report upon a Collection of Hippoboscidae (Diptera Pupipara) from Borneo. By G. F. FERRIS, Stanford University, California.

(With one Plate.)

Through the kindness of Dr. Eric Mjöberg I have been enabled to examine a small collection of Hippoboscidae from Borneo, which is herewith reported upon. The holotypes of the new species described are returned to Dr. Mjöberg for deposit in the Sarawak Museum. Paratypes are retained for the Stanford University collection. Other material is distributed as indicated in connection with the lists of specimens examined.

The lands bordering upon the Indian Ocean are extremely rich in representatives of the three families of the Diptera Pupipara, in fact a majority of all the known species are from this great area. Undoubtedly also there remain many more species still to be discovered. Unfortunately, however, the descriptions of species in this group are in large measure very unsatisfactory and relatively few of the described forms can be recognized with any degree of definiteness from the literature.

The student in this group is therefore confronted with on the one hand the alternative of tentatively identifying material with named forms largely on a basis of probabilities or on the other of naming almost everything as new with the possibility of adding to the synonymy. As has been pointed out in another paper⁽¹⁾ this condition arises in part from the methods that have usually been employed in the study of these insects,

⁽¹⁾ Ferris, G. F., and Cole, F. R. *A Contribution to the Knowledge of the Hippoboscidae*. *Parasitology* 14; 178--205, 1922.

dry, pinned specimens being unsuitable because of the shrinking of the soft bodies. I need not again enlarge upon the methods which I consider should be followed, other than to say that for my own work I employ specimens which have been mounted on slides after suitable preparation.

Of the two alternatives indicated above I have chosen the second, but in case a species may with reasonable certainty be referred to a named form I have done so. Where any considerable doubt exists I have not hesitated to describe species as new. One unfortunate feature of most of the systematic work on this group is the almost complete lack of figures. Because of this I am presenting figures wherever anything at all is to be gained by doing so. It is my hope that the species here dealt with may be readily recognizable from the descriptions and figures given.

GENUS ORNITHOICA Rondani.

Hippoboscidae with functional and non-caducous wings in which there are seven veins behind the costa and three cross-veins, the third vein (R4+5) approximate to (usually said to be confluent with) the second vein (R2+3) for a considerable portion of its length; ocelli present; claws two-toothed.

Several species, most of which are from the Eastern Hemisphere, have been referred to this genus, but the status of most of them is very dubious. I am, however, referring the single specimen in the collection at hand to a named species for, as far as may be judged from the literature, it in all probability belongs to this.

ORNITHOCIRA BECCARIINA Rondani. (Plate 11, fig. 1; text, fig. 1.)

Specimens Examined. A single female from *Cissa jeffreyi*, Mt. Murud. This specimen is returned to the Sarawak Museum.

Notes. The more distinctive features of this species are as follows. Length (on slide) 3 mm., length of head and thorax 1.75 mm. General color dark brown. Abdomen with but three transverse plates on the dorsum in addition to the basal plate and the paired apical plates, differing in this respect from *O. promiscua* Ferris and Cole and *O. turdi* Latr. which have four plates. Ventral side of the abdomen without a cluster of chitinous, seta-bearing tubercles at the margin near the base

and the apex as in *O. promiscua*. Legs with a conspicuous pale ring at about the middle of the tibia, this being much more marked than in *O. promiscua*. Posterior tibia with a small, but distinct chitinous spur at the inner apical angle text (fig. 1c), a structure that is not present in *O. promiscua*, at least.

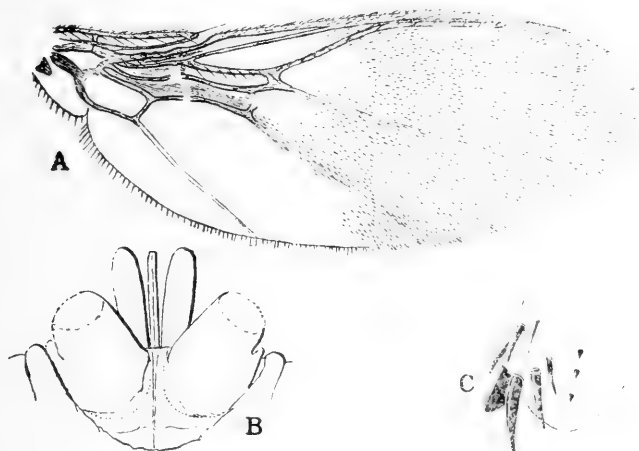


Fig. 1. *Ornithoica beccariina* Rondani. A wing; B clypeal region of head; C spur at apex of posterior tibia.

Recent authors have considered that this species should be placed as a synonym of *O. confluenta* Say, but there is no justification for this as *confluenta* is not recognizable from the original description.

GENUS ORNITHOPHILA Rondani.

Hippoboscidae with functional and non-caducous wings which have seven veins behind the costa and but two cross veins; claws three-toothed; ocelli present; antennae small and short; clypeal region (in the one species where this structure is described) projecting on each side like a horn beyond the apex of the antenna; abdomen with a finely striate median dorsal region.

This genus is based upon *O. vagans* Rondani which was described in 1879 from a single specimen taken in Italy. One other species, *Ornithomyia simplex* Walker, was referred to

this genus by Austen in 1903. Neither of the species is recognizable from the descriptions. I have consequently described as new under the name of *O. makilingensis* a species that I have received from the Philippine Islands and the description of this species is now in press in the Philippine Journal of Science. This species is represented in the material at hand.

I may here call attention to a possible connection between this genus and the genus *Icosta* Speiser. The latter was based chiefly upon the peculiar character of the clypeal region, which is identical with the condition found in *O. makilingensis*. The genus differs from *Ornithophila* in the supposed absence of ocelli but I am not able to avoid the suspicion that the two may be identical.

ORNITHOPHILA MAKILINGENSIS Ferris. (Plate 11, fig. 3; text, fig. 2.)

Specimens Examined. One male and one female from *Haematortyx sanguiniceps*, Mt. Murud. The male is retained; the female is returned to the Sarawak Museum.

Notes. This species was described from a single female from the Philippine Islands and the description is in press at the time of the present writing. This specimen is a female in which the abdomen was not fully expanded; consequently there are certain differences between it and the specimens listed here which will be noted. The specimen having been returned is not available for comparison but I feel no doubt as to the identification.

In the original description no mention was made of the presence of a small, chitinized plate on the dorsum of the abdomen just caudad of the basal plate. Such a plate is present in the female from Borneo and was probably merely retracted beneath the basal plate in the Philippine specimen.

The length of the specimens at hand is 5 mm. for the female and 4.5 for the male (on the slide); general color, after mounting, a light brown. The male is here figured (Plate 11, fig. 3). It differs from the female but little, the abdomen being less rotund and the external genitalia being represented by a pair of small protuberances which are the vestiges of the claspers. It is not possible on the basis of this specimen to give any discussion of the internal genitalia. The wing (text

fig. 2a) is entirely covered with minute setulæ (not shown in the figure) except for a narrow marginal area behind the anal

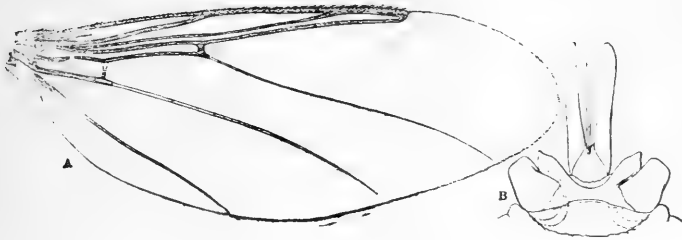


Fig. 2. *Ornithophila makilingensis* Ferris. A wing (vestiture of setulæ not shown); B clypeal region.

vein. The veins are entirely bare except for numerous small setæ along the entire length of the costa.

GENUS ORNITHOCTONA Speiser.

Hippoboscidae with functional and non-caducous wings which have seven veins behind the costa and three cross veins; claws three-toothed; first segment of the posterior tarsi with a distinct transverse comb of setae on the plantar surface at the base; ocelli present; antennae very large and broad, flattened, nearly parallel, slightly exceeding the palpi in length.

This is a rather large genus, containing about twenty names, but almost none of the species are recognizable from the existing descriptions. A number of the species are from the Indian Ocean region and possibly the two here described are synonyms of some of these.

I wish here to call attention to the most distinctive character of the genus, the transverse comb of setae on the plantar surface of the first segment of the posterior tarsi. This is a character that has not been observed previously and that is not mentioned in any descriptions of the genus.

ORNITHOCTONA SOROR n. sp. (Plate 11, fig. 2a--d, fig. 4.)

Specimens Examined. Two females from *Buchanga stigmatops*, Mt. Murud.

Female. (Plate 11, fig. 4.) Length (on slide) 6.5 mm., length of head and thorax 3.5 mm. General color (on slide) a pale brown.

Head slightly wider than long, almost destitute of setae above. Antennae (Plate 11, fig. 2c) about half as long as the head, margined with many slender setae, the apex blunt and but slightly constricted.

Thorax with the disc entirely bare; humeral angles strongly and acutely produced, bearing numerous quite long, slender setae; lateral margin before the base of the wing with numerous setae of various lengths; mesonotum with a single very long seta near the base of the wing; scutellum with four apical setae and margined with a few fine setae. Ventral side bare except for small setae about the mesocoxal cavity; sternum produced anteriorly into two acute processes (Plate 9, fig. 2d) between the anterior coxae.

Legs apparently with no specifically distinctive characters except the absence of a lamellate process at the apex of the anterior tibiae.

Wings (Plate 11, 2a) light brown in color, the veins quite dark; setulae few, arranged in faint, irregular patches toward the apex of the wing, as indicated in the figure; veins entirely destitute of setae except for the basal portion of the coxa which bears a number of long setae, the remainder of its length beset with small setae.

Abdomen membranous throughout except for a narrow basal segment on the dorsal side; three small median dorsal sclerites, a pair of small subapical dorsal sclerites and a small basal ventral sclerite. The basal segment on the dorsal side is beset with numerous setae which become quite long at the lateral margins; remainder of the dorsum except the plates and the apex thickly and uniformly beset with small, slender setae, which are not borne upon chitinized prominences. Basal plate on the ventral side with numerous small, stout setae, the remainder of the ventral aspect beset with small setae as is the dorsum, those about the genital opening being long and slender.

Notes. This species is extremely close to *O. strigilecula* Ferris from South America. I have compared the specimens directly with the type of the latter species and the only really significant differences that I have found are as follows. The antennae in *O. soror* are noticeably blunter than in the other, the processes of the mesosternum sharper and longer, the setae of the abdomen noticeably more numerous and more slender. When more is known as to the distribution of these forms it may very well prove that they should merely be regarded as sub-species of the same thing.

ORNITHOCTONA MAGNA n. sp. (Plate 11, fig. e--h.)

Specimens Examined. Ten females and three males from the Kalabit district on *Spilopelia tigrina*. Holotype, a female, paratype females and one paratype male returned to the Sarawak Museum. Remainder retained in the Stanford Collection.

Female. Length on slide 12 mm.; length of head and thorax, 6 mm. In alcoholic specimens the head and thorax above are very dark brown except for the frontal vitta of the head and the humeral regions of the thorax which are pale; entire underside of head and thorax pale and legs pale at base of femur; remainder of legs almost black; abdomen grey.

In general characters very closely approaching the preceding species, the description and figure of chaetotaxy of head and thorax applying almost equally well to either. There is a slight tendency toward a greater number of setae than in *O. soror*, the scutellum of *O. magna* bearing as many as eight long setae instead of four.

Antennae (Plate 11, fig. 2g) noticeably more slender and more constricted toward the apex than in *O. soror*. *Thorax* with the anterior processes of the mesosternum (fig. 2h) short and broad. *Legs* with a pronounced lamellate process at the apex of the anterior tibiae (fig. 2f) which is absent in *O. soror*.

Abdomen entirely devoid of chitinous plates, except for the basal plate both dorsally and ventrally as in *O. soror*; completely covered, except for the apical region, with small setae which are set on minute, chitinous prominences; position of the paired apical plates in *O. soror* marked by a cluster of 3--5 long setae. Ventral side with long setae surrounding the genital region as in *O. soror*.

Male. Length (on slide) 8.5 mm. General form and characters of head and thorax as in the female *except that the lamellate process of the anterior tibiae is lacking.*

Abdomen (fig. 2e) differing from that of the female in the presence of well-marked dorsal plates, there being two large median plates, succeeding these a broad plate which extends entirely across the abdomen and succeeding this a pair of small plates which extend partially to the ventral side. Ventral side as in the female, there being no vestiges of claspers. Internal genitalia small.

Notes. As compared with *O. soror* this is a very strongly-marked form, the comparatively huge size, the absence of abdominal plates in the female and the other characters given distinguishing it at once.

Explanation of Plate 11.

- Fig. 1. *Ornithoica beccariina* Rondani. Female, wings removed.
 ,, 2. *Ornithoictona soror* new species. A wing; B first segment of posterior tarsus; C clypeal region; D processes of mesosternum. *Ornithoictona magna* new species; E abdomen of male; F lamellate process at apex of anterior tibia of female; G clypeal region; H processes of mesosternum.
 ,, 3. *Ornithophila makilingensis* Ferris. Male, wings removed.
 ,, 4. *Ornithoictona soror* new species. Female, wings removed.

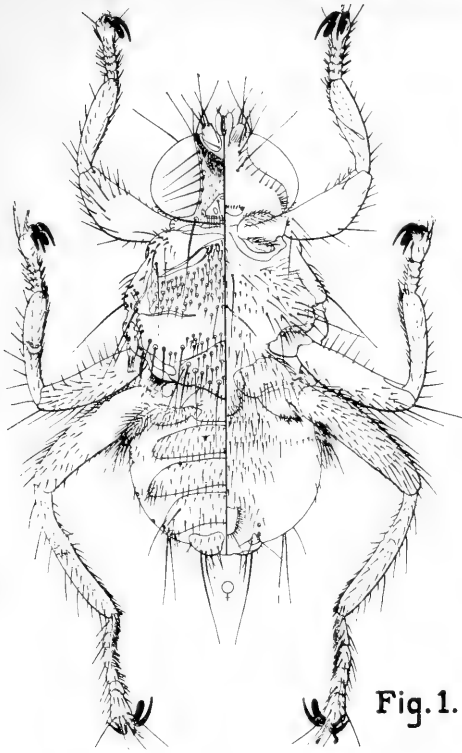


Fig. 1.

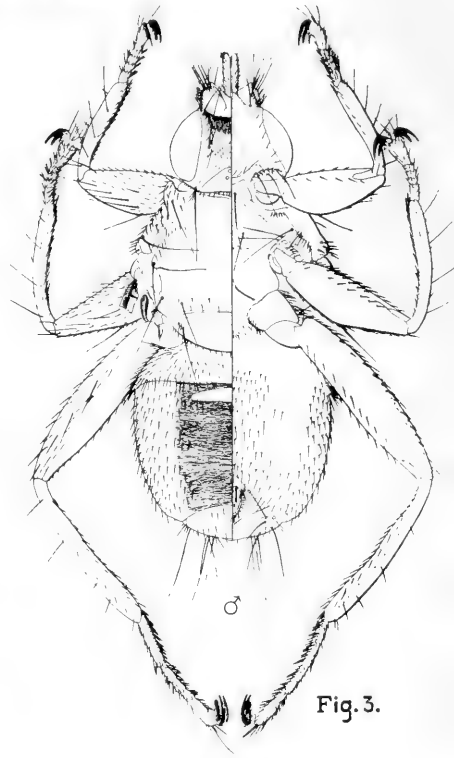


Fig. 3.

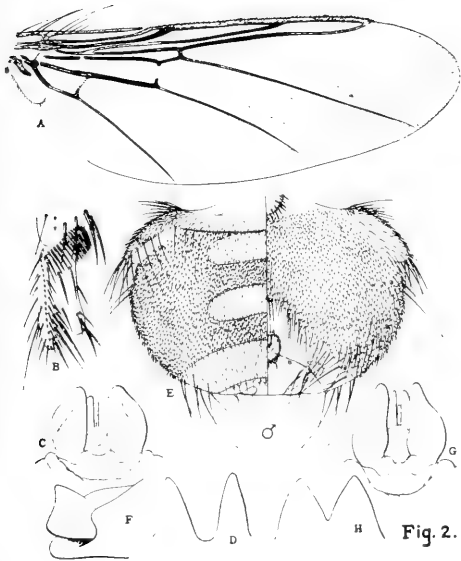


Fig. 2.

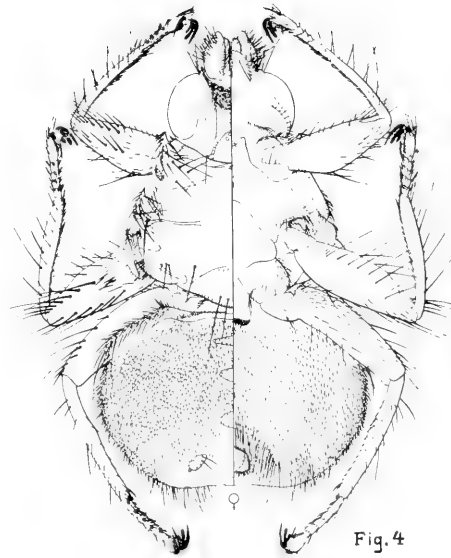


Fig. 4.

XVI.—Siphonaptera from Borneo. By DR.
K. JORDAN and the late HON. N. CHARLES ROTH-
CHILD, M.A.

The collection of Siphonaptera submitted to us for study by Dr. E. Mjoberg consists of four species obtained by him on a recent expedition to Mt. Murud and Mt. Dulit. So little is known of the Bornean Siphonaptera that no fewer than three out of the four species are new to science. As was to be expected these new fleas are nearly related to forms described

XVI.—SIPHONAPTERA FROM BORNEO.

Since going to press we find the material of this article has been included in a paper entitled "New Siphonaptera" appearing in *Novitates Zoologicae*, vol. xxxiii, 1926.

♂. Seventh abdominal tergite with a short median dorsal process, which, in a lateral aspect, is slightly lanceolate. Eighth tergite (fig. 1) large, as in *C. idoneus* Roths (1919), *C. fimbriatus* J. & R. (1921) and allied species, bearing a dorso-apical row of 9 to 11 bristles, 5 to 7 lateral ones, and

1870

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Dr. Mjoberg has kindly permitted us to retain the types for our collection, which will ultimately be incorporated in that of the British Museum.

1. *CTENOCEPHALUS CANIS* Curtis (1826).

One specimen found in the jungle at Mt. Dulit, 3500 feet.

2. *CERATOPHYLLUS CORNEENSIS* nov. sp. (Figs. 1, 2, 3).

♂ ♀. Closely related to *C. agathus* J. & R., Ectoparasites 1, p. 225, No. 6, text fig. 219 (1922), from Sumatra, which is only known from a single ♀ obtained by E. Jacobson. The present species differs in the tail end.

♂. Seventh abdominal tergite with a short median dorsal process, which, in a lateral aspect, is slightly lanceolate. Eighth tergite (fig. 1) large, as in *C. idoneus* Roths (1919), *C. fimbriatus* J. & R. (1921) and allied species, bearing a dorso-apical row of 9 to 11 bristles, 5 to 7 lateral ones, and

ventrally two long bristles, accompanied in one of the two ♂ before us by a small bristle. Eighth sternite (viii. st.) with a short narrow manubrium directed upward, one on each side; from this vertical portion distad the segment is for a short distance narrow and undivided, then divided into two ovate-lanceolate lobes, one on each side, which distally become membranous, and bear proximally a small ventral bristle each; the margins are entire, not fringed. As in *C. levis* J. & R. (1922), the ninth tergite (fig. 2, ix. t.) dorsally much less produced cephalad than in *C. idoneus*, *C. hastatus*, *C. fimbriatus*, etc. The manubrium (M) without hump dorsally at the base; the non-movable process P of the clasper (CE) twice as long as broad; its apex rounded on the anterior side, whereas the posterior



apical angle projects as a short nose; the two acetabular bristles, slender and moderately long, close together on a slight projection at the ventral distal angle of the clasper; from this point frontad the body of the clasper widens and then its margin quite abruptly turns dorsad. The movable exopodite F widest apically, narrowest at the base, its dorsal frontal angle about 90° , with the tip produced into a short projection, the apical distal margin rounded, with the ventral angle widened downward as a short lobe; the exopodite bears six large spiniform bristles, two being placed above the middle of the posterior

margin, of which the upper one is the longest of all, and the second the smallest, the four others placed further down, three of them in a vertical row near the margin, and the fourth on the side near the uppermost of the three. Vertical arm of ninth sternite (ix. st., fig. 2) slender, ventrally gradually curving anad, widest below the manubrium M, the apex acuminate or subacuminate, and pointing dorsad-cephalad; ventral arm basally narrow, widened ventrally before middle into a rounded hump which bears a row of 4 to 6 bristles, the two posterior ones of them the strongest; from the most ventral point of this hump or lobe to the apex the sternite about three times as long as broad, and slightly curved upward, with the apex rotundate-truncate; this apical portion of the ninth sternite is studded with numerous short bristles, and bears at some distance from the ventral margin a row of 7 or 8 longer bristles; the dorsal margin is straight apically, and then obtusely angulate, near this angle a bristle which is rather smaller than the longish subventral ones of this sternite. Anal sternite long, widest proximally of middle, with a row of nine long slender bristles along the dorsal margin.

♀. Seventh sternite (fig. 3, vii. st.) deeply sinuate, the sinus much narrower than in *C. agathus*, the lobe above the sinus somewhat narrower, and projecting much more anad than the lower lobe, which is broad, obliquely truncate, with the apical margin slightly incurved. Receptaculum seminis (R.s.) with a longer head than in *C. agathus*.

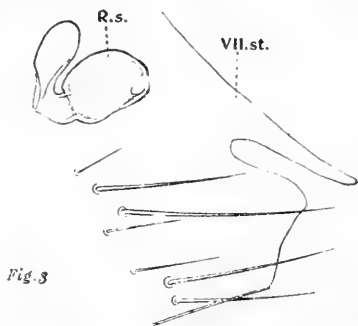


Fig. 3

Two ♂ and one ♀ from Mt. Murud off *Sciurus jentinki*, 28th September, 1922.

3. *STIVALIUS MJÖBERGI* nov. spec. (Figs. 4, 5).

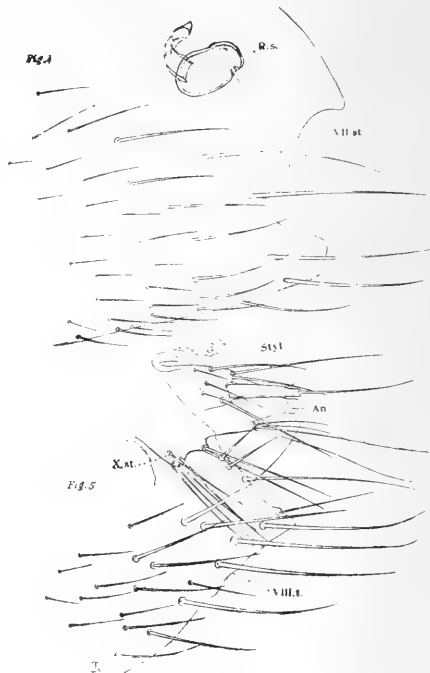
♀. This is a species with two combs on the abdomen. It is closely related to *St. jacobsoni* from Sumatra, which has only one abdominal comb (similar to the prothoracic comb) and is smaller. Chaetotaxy almost alike in the two species.

Rostrum reaching to apex of forecoxa. Comb of second abdominal tergite containing 16 spines (on the two sides together), that of third tergite 8 spines, the fourth tergite having one short spine on one side and two on the other. Marginal angle of tergite vii. below antepygidial bristles more strongly rounded than in *St. jacobsoni*. Lobe above sinus of seventh sternite (fig. 4) acuminate, its lower edge incurved, the ventral lobe broader than in *St. jacobsoni*, rounded at apex. Anal sternite (fig. 5) with long bristles only, namely a proximal bunch of 5 (in this specimen), a middle pair, and two apical pairs, on the two sides together, the sternite being twice incurved ventrally, i.e., slightly so behind the proximal bristles, and again more distinctly behind the middle pair. Receptaculum seminis (R.s.) of a different type, more nearly resembling that of *St. synctus* J. & R. (1922), its head widest near the tail, and its dorsal surface concave behind middle. Hind femur with two subapical ventral bristles on the outer surface. Tibiae with fewer large dorsal bristles, the shorter dorsal bristles not forming a sort of comb as in *St. jacobsoni*.

Length 4.3 mm. (mounted specimen).
 One ♀ from Mt. Murud off *Tupaia montana baluensis*.

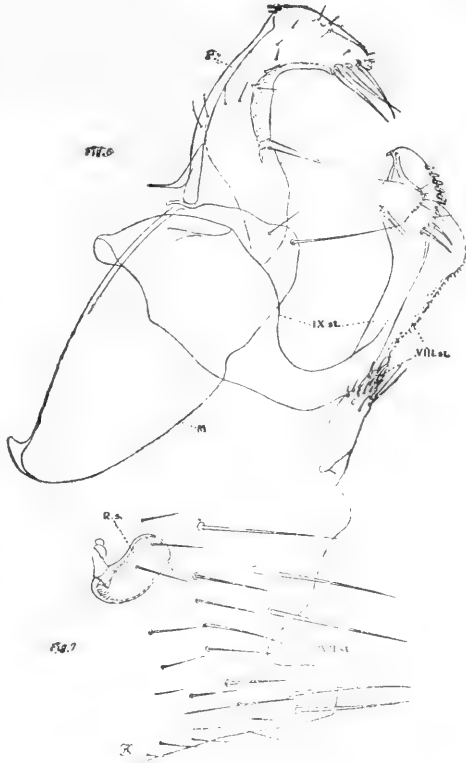
4. *STIVALIUS RHAEBUS* nov. spec. (Figs. 6, 7).

Allied to *St. robinsoni* Roths., 1905.



♂. Eighth abdominal sternite (fig. 6) ventrally below the ninth sternite with a spinose process, which is much shorter than in *St. robinsoni*; no other species besides these two is known to have a similar process. Exopodite F more strongly curved, the neck narrower, the apical portion larger, a ventral row of three large bristles close to apex, proximally to this row one or no ventral bristle, near the margin of the eighth sternite two slender ventral bristles.

Ventral arm of ninth sternite (ix. st.) with a very short, apical, tooth-like, upward projection; at ventral margin near apex a row of five short blunt spines and proximally to this row three small bristles and two heavier spiniform ones; above these ventral bristles a broad lateral flap on the outer surface, bearing a row of small bristles which point downward (probably laterad in life); above this lobe the segment convex, bearing on the inner side at the dorsal margin a patch of small bristles. The armature of the ejaculatory duct differs from that of *St. robinsoni*, particularly in the ventral apical sclerite being longer, acuminate, finger-like.



♀. The sinus of the seventh sternite (fig. 7, vii. st.) larger than in *St. robinsoni* ♀, more triangular, the ventral margin of the upper lobe more slanting.

Head of receptaculum seminis narrower than in *St. robinsoni*, but as the organ varies in *St. robinsoni*, the difference can hardly be expected to hold good.

Length ♂ 2.4 mm., ♀ 3.4 mm.

One pair from Mt. Dulit, off *Sciurus brookei*.

XVII.—On a Collection of Stag-Beetles (Fam. Lucanidae) from Sarawak. By

P. NAGEL, Hannover, Germany.

(With one Plate.)

The late Curator of the Sarawak Museum, Dr. E. Mjöberg, has been kind enough to send me a collection of stag-beetles, made by him during his recent expeditions to some unknown regions of North Sarawak. It contains besides many extremely rare species not less than nine unknown ones, which are found described below. Also some species collected by Dr. Mjöberg on Mt. Poi and Mt. Penrissen in South Sarawak are included here.

1.—HEXARTHRIUS Hope.

H. MANDIBULARIS Devr.

(Ann. Soc. Ent. Fr. (6) I, 1881, p. 237, t. 5, fig. 2.)

I have never seen a ♂ or a ♀ of this species and cannot state with certainty that the ♀ has been described. But the only specimen in question so completely agrees in colour and other parts with the description of the ♂ by Deyrolle that I have no doubt in saying that it is the ♀ of this beautiful species. The body is more slender than in *H. deyrollei*; the colour is a dark chestnut-brown, the underside, the elytra (except the darker suture) and the legs reddish-brown; the sides and the anterior half of the head are deeply and narrowly punctured; before the eyes a flat groove nearly smooth and shining; ocular canthus broad and as well as the mandibles distinctly punctured; the prothorax is broader than the head, the disc shining, but finely punctured, the waved sides and the anterior and posterior margin with the exception of the middle parts strongly punctured; the anterior angles of prothorax are rounded, the posterior excavated and close to the

excavation there is a small but distinct thorn; the scutellum with some few punctures; the elytra are shining, in the middle densely but very finely punctured; the base, the sides, and the tips more strongly punctured; the humeral angles rounded. Each elytron shows a distinct stria in form of a slit which begins laterally of the shoulder and ends near the tip. Outwards of this stria and in the posterior half of elytra there is one short and inwards two longer hardly visible cortae. The mentum is very rugous; the metasternum and the chancelled epipleura deeply punctured; the front tibiae have 4-5, the middle and hind tibiae 1 large tooth.

Long. Corp. 38 mm. latit. prothorax 15 mm.; elytra 16 mm.
1 ♀ from Mt. Penrissen, 3600 feet (E. Mjöberg leg).

2.—NEOLUCANUS Thom.

N. BORNEENSIS Houlbert var. *niger* nov. var?

♀. Niger; in omnibus partibus cum *N. borneensis* consentiens, Long. corp. 30 mm; lat. max. 12.5 mm.

♂ ignotus.

Habitat: Mons Murud, Sarawak, Borneo.

NEOLUCANUS BORNEENSIS Houlbert.

Insecta, iv, 1914, p. 279.

Is of the same chestnut colour as *N. muntjæ* Gestr. (Ann. Mus. Civ. Genova, xvi, 1881, p. 314, fig. Leuthner; Monogr., 1885, p. 422.) The above described female is completely conformable with *N. borneensis* but is black in all parts. It is possible that the coloration of *N. borneensis* varies from chestnut to black, but before this inconstancy of the colour has been proved by a long series of specimens, the new subspecies must be kept up.

The type in the Sarawak Museum.

3.—ODONTOLABIS Hope.

O. GAZELLA Fabr.

Man. Ins., i, 1887, p. 18; Ent. Syst., i, 1792, p. 238; Syst. El., ii, 1801, p. 250, Herbst, Käfer iii, 1790, p. 313; Thunberg. Mem. Soc. Ent. Mosc., i, 1806, p. 162; Leuthner, Monogr., 1885, p. 463, t. 96, fig. 10, 11, ♂ and ♀; t. 91, f. 6 ♀; Möllenkamp, Insektenbörse, xxi, 1904, p. 347 (forma telod.); = *bicolor* Oliv., Entom., i, 1, 1789, p. 22, t. 5, f. 20.; Burm. Handb., v, 1847, p. 330; Thoms., Ann. Soc., Ent. Fr. (4), ii, 1862, p. 395; Parry, Trans. Ent. Soc. London (3), ii, 1864, p. 77.

2 ♀ from Mt. Poi, 4000 feet, and Mt. Penrissen, 3600 feet.

O. LEUTHNERI Boil.

Naturaliste, xix, 1897, p. 247, f.; Möllenkamp, Insekterbörse, xxi, 1904, p. 341 ♂ (forma telod.); v. Rothenburg, Gubener Ent. Zeitsch., 1900, p. 92, ♀; Möllenkamp, Insekterb., xxii, 1905, p. 1-2, ♀.

1 ♀ from the Kalabit country, 3000 feet.

The female of this species is very similar to that of *O. lowei*, as already pointed out by v. Rothenburg and Möllenkamp. But both of them seem to have overlooked the following two differences: The prosternal process of *O. lowei* is large and vaulted and the tip directed downwards and backwards; the outer margin of the elytra in the first third is not broadly turned horizontally. In *O. leuthneri* (♀) the posternal process is narrow in form as a keel, the tip truncated and not directed backwards. The anterior margin is broadly turned horizontally. v. Rothenburg says in his diagnosis of the female that the elytra are *moderately* shining. In the above-mentioned specimen the elytra are very lustrous and therefore it may be possible that it is the female of the variety described below.

4.—*O. LEUTHNERI* var. *BRUNNEUS*, v. n.

FORMA TELODONTA.

Niger: capite magno, fornicato, margine antico laeviter arcuato, postice valde angustato, ante oculos angulis laeviter rotundatis, post oculos valde rotundatis, circum et post oculos sparsim et fortiter punctato: labro producto, laeviter rotundato: mandibulis elongatis, falciformibus, canitis prothoracisque longitudine perpaulo brevioribus, opacis, furcatis, ad basim intus gibba minuta, ante furcam intus 7-8 serratis, supra laeviter, at subtus fortiter canaliculatis: genis valde punctatis, circum oculos macula triangularis levis ut in *O. leuthneri*. Mento ferrugineo-piloso. Prothorace granuloso, in disco stria leve, et utrinque striae hujus fovea parva instructo, secunda fovea in angulo postico, antice laeviter angustato, postice bisinuato, angulis posticis valde excavatis. Elytris rufo-piceis, parum nitidis, in primo triente latioribus, secundum suturam striato-punctatis: epipleuris rufo-maculatis. Femoribus piceis, tibiis pedibusque nigris: tibiis anticis laeviter arcuatis, denticulo minuto instructis, 4 posticis inermibus ac aureo-pilosis.

Long. (mand. excl.) 47.5 mm., mand. 16 mm. Latit. max. elytr. 22.5 mm. Hab. Mons. Murud, Sarawak, Borneo septentrionalis.

This variation differs from *O. leuthneri* by the dark chestnut coloration of the elytra and the denticulation of the mandibles in the forma telodonta. The suture is accompanied by a row of fine but distinct punctures; other rows may be seen only with the glass; the outer parts of the elytra are somewhat granulated at the shoulders. The scutellum is deeply punctured. The semi-circular mandibles show at the inner margin near the base a little thickening as the rest of a very little

tooth. The inner margin is serrated with 7-8 little teeth from the middle to the forked tip and has no large tooth somewhat below the middle, as Möllenkamp describes from the telodont form of *O. leuthneri*. It may be, that the form in question of the mandibles represents the true telodont form, and that the form with the median tooth, described by Möllenkamp, is only an intermediate connecting link between the real forma telodonta and the forma mesodonta, as we can observe it in *O. alces* Fabr. The other signs are as in *O. leuthneri* Boil.

1 ♂ from Mt. Murud, 6500 feet. The type in the Sarawak Museum's collection.

O. LOWEI Parry.

Trans. Ent. Soc. London, 1873, p. 336, t. 5, f. 1; Leuthner, Monogr. Odont., 1885, p. 470, t. 95, f. 9; v.d. Poll, Notes Leyd. Mus., xii, 1890, p. 159 (forma priod.); Albers, Deutsche Ent. Zeitschr., 1894, p. 165; Zang, ibidem, 1905, p. 214 (forma mesod.); Griffini, Atti della Soc. Ital. Sc. Nat., xlv, 1906, p. 111-139; (*rufonotatus* v. Rothenburg, Gubener Ent. Zeitschr., 1900, p. 93, teste; Albers, Deutsche Ent. Zeitschr., 1894, p. 166).

1 ♂ of the forma telodonta from Mt. Murud, 6500 feet.

O. STRIATUS Deyr.

Ann. Soc. Ent. Fr. (4), iv, 1864, p. 313; Westw. Trans. Ent. Soc. London, 1874, p. 360, t. 3, fig. 4; Leuthner, Monogr. Odont., 1885, p. 477, t. 97, figs. 2, 3.

1 ♂ from Gunong Gadin, Lundu, Sarawak.

This male is the largest, I have ever seen. Total length 51 mm., mand. 15 mm.; breadth of prothorax 18 mm. The form of the mandibles agrees exactly with figure 2 in Leuthner's Monograph of the Odontolabini (t. 97, Trans. Ent. Soc. London, xi, 1885, p. 385-491, t. 84-97).

O. WATERSTRADTI v. Rothenburg.

Gubener Ent. Zeitschr., 1900, p. 84, 1 ♂ forma priodonta; long. corp. (mand. excl.) 54 mm., mand. 10 mm., latit elytrorum 13.5 mm.

From Mt. Murud, 6500 feet.

5.—PROSOPCOELUS Hope.

P. OCCIPITALIS Hope.

Cat. Lucan. Col. 1845, p. 13 ♂ and ♀. Westw. Cab. of Orient. Entomol 1848, p. 22, t. 10, f. 4 ♂. (=astericus Thoms., Ann. Soc. Ent. Fr. (4) ii, 1862, p. 417. Waterhouse, Ann. Mag. Nat. Hist. (6) v, 1890, p. 35); Kriesche, Archiv. f. Naturg. (8) 1920, p. 120.

1 ♂ from Mt. Poi, 4000 feet.

This specimen belongs to the priodont form ; it is distinguished from the Sumatran form by the larger black spot in the middle of the prothorax. The species is often named *Metopodontus* (vide Coleopterorum Catalogus Junk-Schenkling pars 8, G. van Roon, Lucanidae) ; that is incorrect, for with its deeply excavated front it is a typical *Prosopocoelus*. (Conf. Kriesche, Archiv. f. Naturg. (8) 1920, p. 120.)

6.—CYCLOMMATUS Parry.

C. CANALICULATUS Rits.

Notes Leyd. Mus., xiii, 1891, p. 235 ; l.c. xv, 1893, t. 2, f. 3 ♂.

1 ♂ of large development (47 mm.) from Mt. Murud.

2 ♀ from Kalabit country and Lio Matu.

From Mt. Murud Dr. Mjöberg has brought also the pupa of a male of the priodont form ; this pupa shows distinctly the deep groove along the middle of the prothorax.

C. canaliculatus was described from Nias, but in his note xxii, Mr. Ritsema enumerates it as inhabiting also the island of Borneo. (Notes Leyd. Mus., xvii, 1895, p. 141.)

C. LUNIFER Boil.

Naturaliste 1905, p. 71, f. ; l. c. 1905, p. 286.

2 ♂, 32 and 42 mm. with full developed mandibles, and 1 ♀, from Mt. Murud, 6500 feet.

The two male specimens have the labrum somewhat broader than those from Sumatra in my own collection ; the species was originally described from Sumatra.

C. MAGNIFICUS sp. n.

Cyclommati montanelli Möllenk. subsimilis, aequaliter coloratus.

(a) *Forma telodonta*: Caput, prothorax et mandibulae brunneo-metallicae, partim preo-nitentes, subtus viridi-metallicus.

Capite supra triangulariter depresso, margine antico non deflexo, granuloso, lateribus valde rugosis, labro rotundato et margine antico piloso. Mandibulis porrectis, leviter arcuatis et deflexis, granulosis apice nigris nitidisque, prothorace elytrisque longioribus, ad basim dente magno triangulo, supra medium subtus dente gracile, ad apicem 10-12 denticulatis. Prothorace transverso, opaco, in disco nitidiore et tenue punctato, lateribus infra in medio angulatis ac postrosum convergentibus. Scutello metallico, ad basim punctato. Elytris opacetestaceis, in disco nitidis, lateribus in primo triente punctatis secundum suturam striato-punctatis, suturam marginibusque externis metallicis.

Pedibus metallicis ; tibiis inermibus, sed subtus et intus dense aureopilosis ; pedibus nigris ac subtus aureo-pilosis.

Long. corp. (mand. excl.) 35-40 mm., mandib. 23-30 mm ; latit. max. elytra 13-15 mm.

(b) *Forma amphiodonta*: Mandibulis capite prothoraceque paulo longioribus, ad basim pluridentatis (3--5), in medio inermibus, apice 8--10 dentatis; cetera ut in forma telodonta.

Long. corp. (mand. excl.) 30 mm., mand. 15 mm.

(c) *Forma priodonta*: Mandibulis serratis, mandibula sinistra paulo longiora; cetera ut in forma telodonta.

Long. corp. (Mand. excl.) 23--30 mm., mand. 6--10 mm.

♀: Elytrorum color ut in mare; prothorax et caput nigrobrunneo-metallicum, valde punctatum; labro punctatissimo. Mandibulis supra et infra denticulo instructis, punctatis, supra canaliculatis. Prothoracis lateribus fortiter punctatis. Elytris punctatis; Pedibus nigris ac ut latus inferior corporis metallico-nitentibus.

Long. corp. 23--28 mm.; latit. 9--11 mm.

Habit. Sarawak, Borneo septentrionalis.

This species is closely allied to *Cyclommatus montanellus* Möllenk. (Insektenbörse, xxi, 1904, p. 372) and differs from it by the denticulation of the mandibles; The colour of the prothorax, of the head, of the mandibles, the underside, the legs and of the scutellum is a metallic copper-brown with greenish reflexes on the sides similar as in Boisd. (Voy. Astrolabe, Col. 1832, p. 236, t. 6, fig. 20.) The elytra are yellowish with a somewhat metallic hue and the sutura and the sides narrowly copper-brown margined; this narrow dark margin becomes 2--3 mm. broad in the first third of the elytra near the shoulders. This characteristic colouring of the sides may be easily overlooked for it can only be seen by considering them. The mandibles in the telodont form are longer than the prothorax and the elytra together, and lightly curved inwards and downwards, very finely punctured, black at the tip and here shining. At the base they have a strong triangular tooth directed inwards (*montanellus* has at the base a little bilobed tooth followed by a row of smaller teeth as in *C. tarandus* Thunb.). Somewhat below the middle they are armed with a thin tooth of 2--3 mm. in length, which arises on the underside and is directed inwards and downwards. The tip of the mandibles has a row of 10--12 small teeth, the first of them somewhat larger so that the tip is very similar to that of *C. metallifer*, *montanellus* and *tarandus*. The head is triangularly flattened and not deeply excavated as in *C. canaliculatus* Rits. at the front margin, which declines gradually to the labrum. The latter is porrected, declivous and rounded at the tip and bordered with golden hairs at the front margin. The prothorax is twice waved at the sides, with a small tooth somewhat below the middle; from the anterior edge to this tooth

the outer margin is horizontal, then it rises to the shoulders. The sides of the prothorax are strongly granulated, the disc more shining and finely but distinctly punctured. Also the sides of the head are strongly granulated. The tibiae have no teeth but they are closely covered with golden hairs as also the soles of the feet.

The underside is dark coppery-brown with a coppery-reddish hue. The prosternal process is narrow and conically projecting.

The median form has the mandibles a little longer than the head and the prothorax; at the base they have 3-5 little teeth, the middle is smooth and the tip is armed with a row of 8-10 little teeth. The smallest form of the male has the mandibles serrated; head and prothorax are more strongly punctured than in the forma maxima. In the small forms the left mandible is a little longer than the right one.

The female is coloured just as the the male, but the head, the prothorax and the elytra are more punctured. The mandibles are strongly developed and armed on the upper and underside with a tooth; from this tooth the upperside is canaliculated to the tip. The colour of the females seems to be inconstant; only a single female showed the clear colour, after having been taken out of the alcohol. The two others had the elytra coloured as the other parts of the body with metallic-green hues at the sides, one of these dark females shows yet distinctly the clearer colour in some parts of the elytra and particularly the characteristic metallic margins. Eight weeks after having been taken out of the alcohol the clear-coloured female had become very much darker, and is quite similar to the two dark females.

The types of the three forms of the male and that of the female are in the Sarawak Museum collection; three cotypes of the male and one of the female in my own collection.

7 ♂, 3 ♀ from Mt. Murud, 6500 feet.

C. TARANDUS.

Thunb.—Men. Mosc., i, 1806, p. 190, t. 12, f. 1; Burm. Handb., v, 1847, p. 374; Thomas, Ann. Soc. Ent. Fr. (4), ii, 1862, p. 421; Gestro, Ann. Mus. Civ. Genova. xvi, 1881, p. 309; Rits, Notes Leyd. Mus., 1902, p. 6, nota; Zang, Deutsche Ent. Zeitschr. 1906, p. 94; =metallifer, Hope (Westw.) Cat. Luc., 1845, p. 5; =rangifer Schönh. Syn. Ins., i, 3, 1806, p. 322; Westw. Cab. Or. Ent., 1848, p. 21, t. 10, f. 2; Rits. Notes Leyd. Mus., xiv, 1892, p. 6, nota; Zang, Deutsche Ent. Zeitschr., 1906, p. 94.

4 ♂, 55-63 mm.

7.—EURYTRACHELUS Thomson.

E. MJÖBERGI sp. n.

E. alcidis Vollenh. et *E. eurycephali* Burm. affinis.

Niger. Capite rectangula to tenue granuloso, laeviter fornicato, in disco duobus foveis parvis instructo, margine antico ad labrum nec perco duobus foveis parvis instructo, margine antico ad labrum nec perpendiculariter truncato. Labro bipartito, similiter ut in *E. titano*, at partibus longioribus, in medio valde semicirculariter excavato, angulis externis labri carina semicirculari conjunctis. Mandibulis capite fere duplo longioribus, tenue granulosis, dente basali magno armatis, furcatis et ante furcam dente minuto instructis; subtus ab basi striato-pilosis. Mento granuloso punctatoque et margine antico piloso. Reliquae partes ignotae; long., cap. 15 mm.; mand. 22 mm.; lat. cap. 28.5 mm.

♀ ignota.

Habit. Mons Murud, Sarawak, Borneo septentrionalis.

This species belongs to the second section as stated by Jakowleff (Hor. Sec. Ent. Ross. xxx, 1896, p. 457), which has the underside of the mandibles provided with a stripe of golden pubescence from the base to the middle or farther to the tip. It is allied to *E. alcides* Vollenh. (Tijdschr. Ent. viii, 1865, p. 150, t. 10, f. 2 ♂, 3 ♀) and *eurycephalus* Burm. (Handb. v, 1847, p. 387). Dr. Mjöberg, after whom I have much pleasure in naming this species, has obtained only the head, but this is sufficient to recognize that it belongs to a Lucanid hitherto unknown. Black, head and mandibles finely granulated; head rectangular and somewhat vaulted, on each side of the middle of the disc with a little groove. Mandibles nearly twice as long as the head, in two thirds of their length straight the last third curved inwards. Near the base a strongly developed triangular tooth, the tip forked and immediately before the fork armed with another smaller tooth. Mentum granulated and provided with very distinct punctures; its anterior margin with golden pubescence.

Type in the Sarawak Museum collection.

E. PROSTI Boil.

Ann. Soc. Ent. Belg., xlv, 1901, p. 15, t. 1, f. 4. Möllenk. Insektenb., xxi, 1904, p. 375.

1 ♂ and 1 ♀ from Mt. Poi, 4000 feet.

2 ♀ from Mt. Murud, 6500 feet, and Mt. Dulit, 3500 feet.

The male specimen is of smaller size, 37 mm. in length; towards the tip of the mandibles the median tooth has a continuation in form of a little edge. The females have a length of 23--27 mm.

8.—*DORCUS* McLeay.*D. PARRYI* Thomson.

Ann. Soc. Ent. Fr. (4), ii, 1862, p. 425 ♂.

1 ♂ from the Kalabit country.

This specimen is of smallest development (33.5 mm.).

9.—*GNAPHALOBRYX* Brum.*G. OPACUS* Burm.

Handb., v, 1847, p. 397; Albers, Deutsche Ent. Zeitschr., 1889, p. 236; Oberth. Houlb. Insecta, 1914, p. 158.

4 ♂ from Songei Tutau, Kalabit country and Mt. Poi; 1 ♀ from Mt. Poi, 4000 feet.

The male specimens are represented in all degrees of development from 20 to 35 mm.; all specimens, males and females, agree completely with those from Nias, Sumatra, and other Malayan islands.

G. PALLIDUS sp. n.

♂: Cano-brunneo tomentosus. Capite transverso, setis brevibus brunneis singulisque tecto, margine antico paulo excavato, angulis anticis valde rotundatis, angulis posticis obtuse productis. Labro brevi ac lato, angulis pilosis. Mandibulis capite perpaulo longioribus, ad basim tomentosus, latisque, margine interiore nigro, dentibus tribus (dens basalis valde productus), supra fere in media dente magno erecto instructis, apicibus acutis, nigris, leviter incurvatis. Mento punctato et excavato. Prothorace transverso, capite latiore, angulis anticis rotundatis, lateribus arcuatis, ante basim spinosis, post spinam lunatis et valde angustatis, in disco foveis duabus instructo, setis singulis tecto. Scutello minutissimo. Elytris prothorace capiteque angustioribus, ellipsi formibus et valde fornicatis, 5 striis setosis et ad basim 2 gibbis nigris nitentibus instructis. Tibiis setosis, anticis 2-3, intermediis posticisque unidentatis.

Long. corp. (mand. excl.) 10 mm.; mand. 2.5 mm.; latit. prothor. 5.5 mm.

Hab. Mons Poi, Sarawak, Borneo.

♀ ignota.

This new and very interesting species is brownish-grey; the upper surface is covered all over although not densely, with brown short bristles. The head is rectangular, the anterior edges rounded, the anterior margin somewhat excavated. The labrum is short but broad. Before the eyes exists a rounded tooth and the posterior edges are also not acute.

The ocular canthus is narrow. The mandibles are similar to those of *G. tricuspis* Rits.

The tip is acute and slightly curved inwards. About the middle of the mandibles their upper surface shows a well-developed tooth directed upwards. At first the mandibles are sinuated downwards, then horizontally directed. The inner margin and the tip are black. The prothorax is broader than the head, the sides waved and forming an acute tip near the base; behind this tip the prothorax is strongly narrowed; on the disc we may observe two grooves and some vaultings. The elytra, narrower than head and prothorax, have the sutures raised and each has 4 longitudinal (the sutural incl := 5) slightly elevated costae, which are, like the sutures, thickly clothed with brown erect scales. These costae are not so well developed as in *G. tricuspis*. Near the tip the elytra are situated 2 black shining tubercles. The legs are slender and squamose, the anterior tibiae are armed with 2--3 teeth, the posterior with 1 tooth.

The type in the Sarawak Museum collection.

1 ♂ from Mt. Poi, 4000 feet.

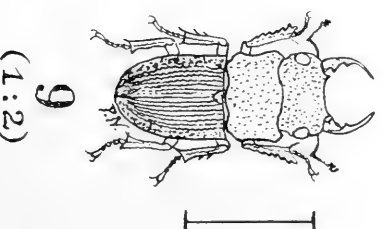
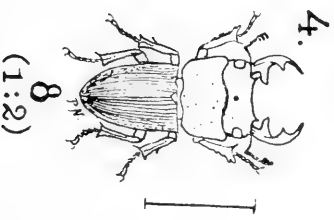
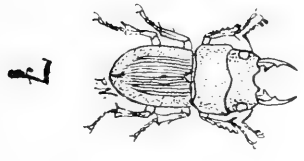
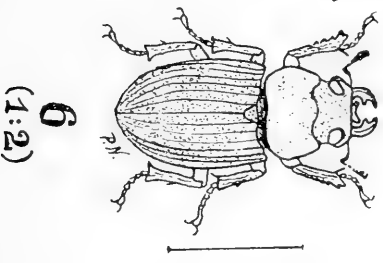
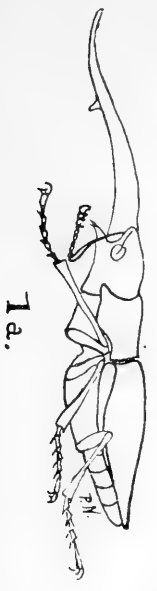
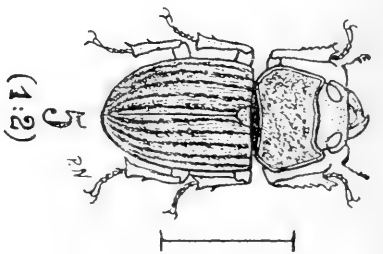
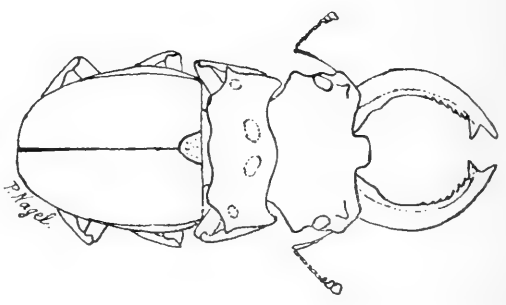
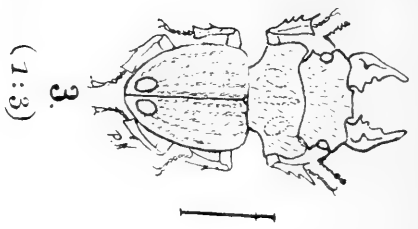
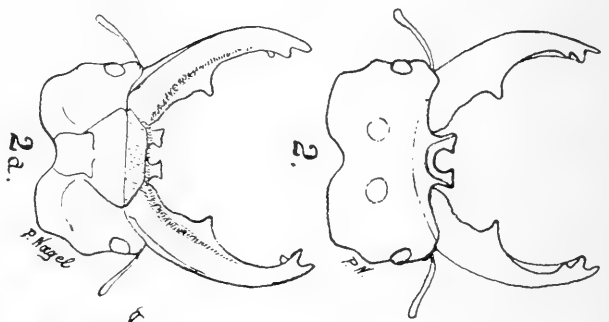
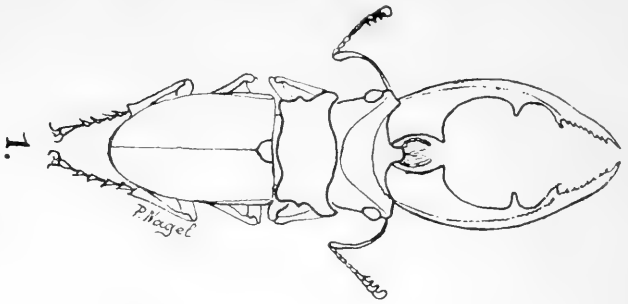
G. TRICUSPIS Rits.

Notes Leyd. Mus., iv, 1882, p. 163; Midden Sumatra, Suppl., 1892, p. 4; Notes Leyd. Mus., xv, 1893, t. 2, f. 5; Möllenk. Intern. Ent. Zeitschr., iii, 1909, Nr. 11, p. 58 ♀.

1 ♂, 1 ♀, from Mt. Dulit, 3500 feet.

Explanation of Plate 12.

- Fig. 1. 1a *Cyclommatus magnificus* ♂ sp. n.
 ,, 2. 2a *Eurytrachelus mjöbergi* ♂ sp. n.
 ,, 3. *Odontolabis leuthneri* var. *brunnea* ♂ var. nova.
 ,, 4. *Xenostomus krieschei* ♀ sp. n.
 ,, 5. *Gnaphaloryx borneensis* ♀ sp. n.
 ,, 6. *Gnaphaloryx pallidus* ♂ sp. n.
 ,, 7. *Aegus sexlineatus* ♂ sp. n.
 ,, 8. *Aegus falcicornis* ♂ sp. n.
 ,, 9. *Aegus punctatissimus* ♂ sp. n.





XVIII.—Some Parasitic Worms from Sarawak. By H. A. BAYLIS, M.A., D.SC.

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The following report deals with a collection of parasitic Nematodes and Cestodes made recently in Sarawak by Dr. Eric Mjöberg, late Curator of the Sarawak Museum, Kuching, and kindly submitted by him to the writer for determination.

The material included eleven species of Nematoda and nine of Cestoda. Of the Nematodes, one species was represented only by a headless fragment, and was indeterminable. One of the Cestodes, a species of *Raillietina* from a Barbet, *Cyanops pulcherrima*, was also in rather poor and fragmentary condition, and has not been more precisely determined. Of the remainder, at least one Nematode and three Cestodes are believed to be new species, and one of the Cestodes seems to represent a new genus of considerable interest. Several of the other species represented in the collection are very little-known forms, and advantage has been taken of the opportunity to supplement the existing descriptions of *Subulura perarmata*, *Streptopharagus pigmentatus* and *Oesophagostomum ovatum*.

Some of the hosts are rare or little-known animals, and it is of particular interest to have obtained material from the Bornean *Mydaus*, a badger-like animal which is related to *M. javanensis* from Java and Sumatra.

Syntypes of the new species will be deposited in the British Museum (Natural History) and in the Sarawak Museum, Kuching. I also refer in the following to some odd finds from other parts of Sarawak.

NEMATODA.

SUPERFAMILY ASCAROIDAE.

FAMILY ASCARIDAE.

Two specimens—one fragmentary and both immature—of an Ascarid of doubtful determination, apparently belonging to the subfamily Ascarinae, were taken from the muscles of a tree-shrew, *Tupaia montana*. Locality: Mt. Dulit.

FAMILY HETERAKIDAE.

SUBFAMILY SUBULURINAE.

SUBULURA Molin, 1860.

SUBULURA PERARMATA Ratzel, 1868.

(Figs. 1—3).

Heterakis perarmata Ratzel, 1868, p. 150, pl. iv, figs. 8—11.

Subulura (?) *perarmata* Travassos, 1913, p. 298.

Subulura (?) *perarmata* Railliet & Henry, 1914, p. 680.

Host: *Tarsius spectrum*. Position: caecum. Locality: Kuching.

The inclusion in the collection of a number of well-preserved specimens of this species makes it possible to add a few details to Ratzel's original description, which appears to be the only one at present available. The dimensions of the male, according to Ratzel, were 6--7 mm. in length and 0.2 mm. in thickness, and those of female 8--10 mm. and 0.4 mm. respectively. The males among the present material attain a length of 11 mm. and a maximum thickness of 0.33 mm., while the females measure up to 14 mm. in length and 0.35 mm. in thickness. The distance from the anterior extremity to the end of the oesophagus, including the bulb, is 1.5--1.75 mm. The cylindrical portion of the oesophagus swells into a club posteriorly, and is joined by a narrow neck to the bulb,

which measures 0.22--0.25 mm. in length and 0.23--0.24 mm. in width. There are broad lateral cervical alae, beginning immediately behind the mouth and extending to a point a little behind the oesophageal bulb. The diameter of the head is about 0.07 mm. The nerve-ring is situated at 0.3--0.35 mm., and the excretory pore at 0.5--0.55 mm. from the anterior end in both sexes. The cuticular striations are very fine and faint, but more conspicuous on the cervical alae.

The structure of the buccal cavity, which is barely indicated in Ratzel's figures, is very curious. The cavity is about 0.08 mm. in length, and is divided into an anterior portion of 0.02 mm., with

fairly thick cuticular walls, and a much longer posterior portion, the walls of which are much thicker and darker in colour, and end in front in a serrated edge. This portion of the cavity increases slightly in width from before backwards. At its base, springing from the cuticular lining of the anterior portion of

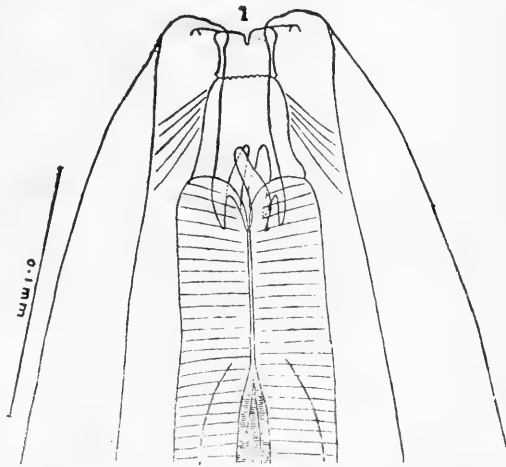


Fig. 1. *Subulura perarmata*. Head of male; dorsal view.

the oesophagus, are the three large and three small tooth-like structures described by Ratzel. The larger teeth are apparently flattened and blade-like, and the smaller teeth alternate with them.

The tail is tapering and drawn out to a fine point in both sexes. In the male it measures about 0.25 mm. in length.

There are no caudal alae. The preanal sucker is situated at about 0.5 mm. from the cloacal aperture, not from the tip of the tail, as stated by Ratzel. The spicules measure about 2.75 mm. in length, and invariably show the remarkable

twisted condition described by Ratzel. The spicules are alate, and almost the whole spicule is twisted in gimlet fashion about its longitudinal axis, the only part not involved being a short portion near the root. Ratzel suggested that this twisting of the spicules might be, at least in part, due to long immersion in alcohol, and was not inclined to lay much stress upon it as a specific character. There seems, however,

to be no reason for believing that it is not a normal and constant character of the species.

The accessory piece (figs. 2, a.p., 3) is, as Ratzel states, 0.15 mm. long, and is shaped much as his figures indicate, though these are somewhat diagrammatic. The organ is largely hollow, having a large opening near its broad anterior end, on the dorsal side. The anterior edges of this

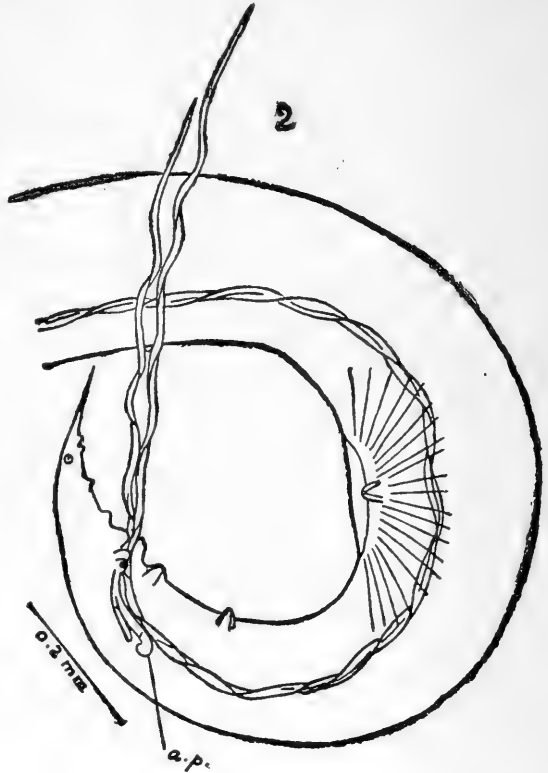


Fig. 2. *Subulura perarmata*. Caudal end of male; lateral view. a.p., accessory piece.

apertures are produced laterally into blunt angles, and from each of these a small flange is reflected dorsally and posteriorly, giving the anterior end of the organ a hooked appearance in lateral view. The caudal papillae were not described by Ratzel. Of these there are ten pairs, fig. 2, the third pair from the tip of the tail being some-

what laterally situated, as are also two pairs at about the level of the cloaca, the rest being subventral. The number and arrangement of the papillae are precisely as in *S. otolicni* (van Beneden), though in other respects the species are very distinct.

The tail of the female is 0.65--0.8 mm. long. The vulva, which was not observed by Ratzel, lies rather in front of the middle of the body (at about 8.2 mm. from the posterior end in a specimen 14 mm. long). The short muscular ovijector runs forward at first from the vulva, but bends sharply back upon itself, ending in an oval chamber like that described by Seurat, in certain allied species, as the glandular portion of the

"sphincter." The eggs are roundish-oval in shape and measure from 0.065 x 0.052 mm. to 0.085 x 0.067 mm.

SUBULURA sp.

A species of *Subulura*, represented by females only, was taken from *Rattus sabanus* at Mt. Dulit, together with *Protospirura muris*. Of the three specimens only one is complete. This measures some 25 mm. in length. The buccal cavity has the lining thickened in its anterior portion, and there are three large, irregularly-shaped teeth at the base. The tail is 1.3--1.5 mm. long, and tapers to a very slender termination. The eggs measure about 0.072--0.08 mm. x 0.058 mm. The species would probably be assigned to *Allodapa* by those authorities who consider that there are sufficient grounds for the separation of *Allodapa*, as a genus, from *Subulura*. It appears impossible to refer the material definitely to any of the species of *Subulura* or *Allodapa* recorded from rodents, though in measurements it closely resembles *S. pigmentata*, Gedoelst, 1917, which occurs in *Sciurus prevesti* in Sumatra.

SUPERFAMILY SPIRUROIDEA.

FAMILY SPIRURIDAE.

SUBFAMILY SPIRURINAE.

PROTOSPIRURA Seurat, 1914.

PROTOSPIRURA MURIS Gmelin, 1790.

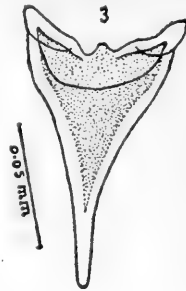


Fig. 3. *Subulura perarmata*. Accessory piece of male; dorsal view.

This species, which is common in rats and mice in many parts of the world, is represented by a number of specimens from the stomach of *Rattus sabanus*. Locality: Mt. Dulit.

SUBFAMILY ARDUENNINAE.

ARDUENNA Railliet and Henry, 1911.

ARDUENNA DENTATA v. Linst., 1904.

Spiroptera dentata von Linstow, 1904, p. 282, pl. i, figs. 5--7.

Arduenna dentata Railliet and Henry, 1911, p. 696.

The collection contains several female specimens which are referred to this species, from the stomach of *Sus barbatus* at Mt. Murud. Unfortunately, there is no male, and the determination cannot be confirmed by reference to the important characters of the male sex. *A. dentata* was originally recorded from *Sus cristatus* in Ceylon, and specimens found in domestic pigs in Cochin-China have been referred to the same species.

STREPTOPHARAGUS Blanc, 1912.

STREPTOPHARAGUS PIGMENTATUS v. Linst., 1897.

Spiroptera pigmentata von Linstow, 1897, p. 604, pl. xxviii, figs. 1--5.

Streptopharagus pigmentatus Railliet and Henry, 1918, p. 84.

Host: *Hylobates mulleri*. Locality: Mt. Murud.

The specimens, according to the label, were found in the abdominal cavity of the host. It is probable, however, that they had wandered into that position from the stomach after the animal's death. The species was recorded by von Linstow from *Cercopithecus albogularis* (an African monkey), and by Railliet and Henry from *Macaca* sp. from the Belgian Congo, but does not seem to have been recorded from Gibbons, and its occurrence in Borneo is interesting.

The present material, reasonable allowance being made for variation in measurements, agrees well, on the whole, with the description given by von Linstow. The masses of "pigment" mentioned by him as being abundant in the cuticle are not visible in these specimens, and it seems probable that they were artifacts caused by some reagent in which von Linstow's

material had been placed. A single cervical ala is present, on the left side, but it is narrow and feebly-developed as compared with that of the genotype, *S. armatus*. The tail of the male has a preanal row of claw-like cuticular structures, arranged in a horseshoe, with the arms of the horseshoe directed posteriorly but not extending behind the anus. These structures are less prominent than in *S. armatus*, being apparently cuticular papillae of the same kind as those covering the general ventral surface of the caudal region, but more highly developed. The writer (1923) has given a summary of the characters of the known species of this genus, and it was there remarked that von Linstow describes and figures five pairs of preanal papillae in the male of *S. pigmentatus*. The fifth pair, close to the anus, though counted in von Linstow's text as one of the pairs of stalked papillae, is figured as sessile. This pair of papillae, which does not appear to exist in other species of the genus, has not been in the material now under discussion, and it may perhaps be doubted whether it was present in von Linstow's specimens.

SUBFAMILY PHYSALOPTERINAE.

PHYSALOPTERA Rudolphi, 1819.

PHYSALOPTERA MYDAI, sp. n. (Figs. 4—6).

Host : *Mydaus* sp. (Bornean badger). Position : stomach.
Locality : Kalabit country.

This is a stoutish form much resembling the genotype, *P. clausa*, in general appearance. The largest male and female measure roughly 30 mm. and 50 mm. in length respectively, with maximum thickness of about 1.2 mm. and 2 mm. or a little over. The distance from the anterior extremity of the head to the posterior end of the oesophagus is 5--6.4 mm., and from the same point to the end of the narrower anterior portion of the oesophagus 0.85--0.9 mm. The cervical papillae are situated at 0.7 mm., the nerve-ring at 0.6 mm., and the excretory pore at 0.85--0.9 mm., from the anterior end. The cuticle is transversely striated at intervals of about 0.002 mm. in the male and 0.004 mm. in the female. In addition to the striations there is a tendency for the cuticle to exhibit many deep transverse wrinkles. The lips are large, rounded externally and obtuse in front. The external surface

of each lip bears three papillae; a small median, lateral papilla which scarcely breaks the surface of the cuticle,* and

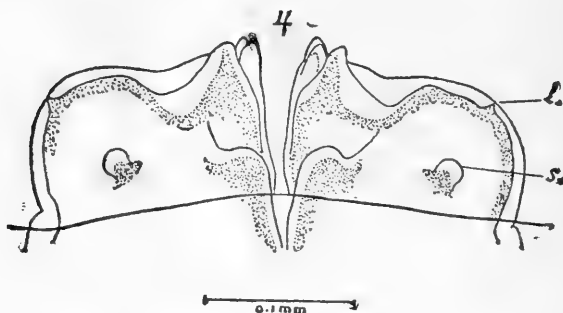


Fig. 4. *Physaloptera mydai*. Head of female; dorsal view. *l*, lateral papilla; *s*, subdorsal papilla.

prominent, dome-shaped subdorsal and subventral papillae. The usual teeth are present on a median prominence at the extremity of the lip—a blunt external tooth and a tripartite internal tooth, the median cusp of which is slightly smaller than the others. At the base of the median prominence

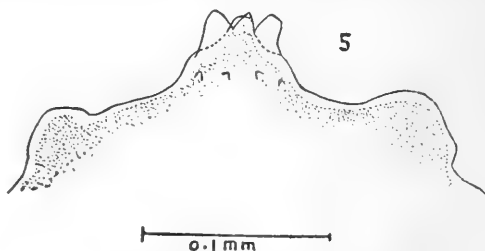


Fig. 5. *Physaloptera mydai*. Lip of female, viewed from inner surface.

there are two pairs of small refringent points, possibly denticles. Towards the dorsal and ventral sides of the dentigerous surface there are also two large, prominent, rounded processes, which can hardly be described as teeth. On the ridges connecting these with the median prominence there may be several small

* Ortlepp (1922) doubts the presence of a lateral papilla in *Physaloptera*. It is a very remarkable fact if this papilla is really absent in most species of *Physaloptera*, since in all other Nematodes with two lateral lips, in which it has been carefully looked for, such a papilla has invariably been found.

rounded papilliform cuticular structures, possibly representing the denticles found in some species of *Physaloptera*, but these are not constant, and no true denticles have been observed.

The tail of the male is 1.7 mm. in length. The caudal end (fig. 6) is provided with very strongly developed lateral alae, forming a "bursa" of the type usual in the genus, and continuous across the ventral surface some distance in front of the anus. The "bursa" is voluminous, vesicular and much folded. Its ventral surface is provided with the usual longitudinal rows of papilliform cuticular processes. In the mid-ventral region these processes are simple and button-like,

but in the more lateral rows they become gradually more elongated, sharp and claw-like. The "bursa" is somewhat asymmetrical, the lateral ala of the right side extending anteriorly somewhat further than that of the left. The usual four pairs of long-stalked lateral papillae are present. Immediately behind the most posterior of these, and a little nearer to the mid-ventral line, is another pair of papillae with moderately long peduncles. About midway

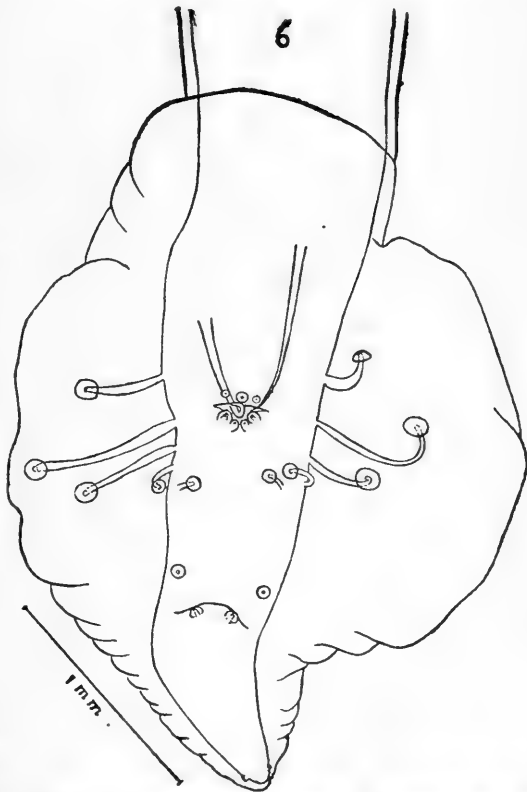


Fig. 6. *Physaloptera mydai*. Caudal end of male; ventral view.

between these and the tip of the tail there are two pairs of sessile subventral papillae, of which the more posterior is

situated on a slight elevation of the cuticle. Near the tip of the tail there is a pair of very minute sublateral papillae. On the anterior lip of the cloaca there is a row of three sessile papillae, that in the middle being slightly larger than the others. On the posterior lip there are two pairs of papillae, the pair nearer to the middle line being slightly smaller than the other. The spicules are subequal, the left measuring 0.85-0.9 mm. in length, the right 0.7--0.8 mm. The right spicule is slightly stouter than the left.

The tail of the female is extremely short (not more than 0.7 mm.) and is very blunt and rounded. The vulva is situated some distance (as much as 5 mm. in some specimens) behind the posterior end of the oesophagus. The vagina runs, on the whole, forward from the vulva, gradually widening into a fusiform egg-chamber which may be bent upon itself. This gives off two narrow tubes which continue to run forward into the oesophageal region, there enlarging into two rather wide uterine branches which turn and run almost straight posteriorly. The eggs measure about 0.06 x 0.035 mm.

FAMILY GNATHOSTOMIDAE.

SUBFAMILY GNATHOSTOMINAE.

TANQUA Blanchard, 1904.

TANQUA TIARA v. Linst., 1879.

Ascaris tiara von Linstow, 1879, p. 320.

Tanqua tiara Blanchard, 1904, p. 478.

(For full synonymy and description see Baylis and Lane, 1920, p. 259.)

This species, which is abundant in Monitors wherever they occur, was taken from *Varanus salvator* at Kuching.

SUPERFAMILY STRONGYLOIDEA.

FAMILY STRONGYLIDAE.

SUBFAMILY STRONGYLINAE.

OESOPHAGOSTOMUM Molin, 1861.

OESOPHAGOSTOMUM OVATUM v. Linst., in Smidt, 1906.

Strongylus ovatus von Linstow, in Smidt, 1906, p. 646, figs. 1-4.

Oesophagostomum ovatum Railliet and Henry, 1912, p. 572, footnote.

A single male specimen which is referred provisionally to this species was collected, in company with *Streptopharagus pigmentatus*, from *Hylobates mulleri* at Mt. Murud. The species was originally recorded by Smidt from *Hylobates syndactylus* and *H. agilis* in Sumatra. It is very inadequately

described, from immature material, and Ihle (1912) has suggested that it is perhaps identical with *O. apiostomum* Willach. From the data obtainable from the present specimen, however, this would seem not to be the case. This individual has a length of about 17 mm. and a maximum thickness of 0.7 mm., as against 10--2.8 mm. and 0.425--0.565 mm. respectively in the males of *O. apiostomum*, according to Ihle. The cuticular striations are 0.02 mm. apart (0.016--0.017 mm. in male *apiostomum*). The cervical groove is at 0.45 mm. from the anterior end (0.262--0.27 mm. in male *apiostomum*). The mouth-capsule is quite different in shape from that of *O. apiostomum* as described by Ihle, being very wide (0.14 mm. in outside diameter), with walls that are more or less lenticular in optical section, and 0.037 mm. in length. In *apiostomum*, according to Ihle, the capsule measures 0.06--0.082 mm. in width and 0.02--0.021 mm. in length. Three slender, pointed and slightly recurved teeth, one dorsal and two subventral, are present near the anterior end of the oesophageal funnel, resembling those of *O. brumpti* as figured by Railliet and Henry (1912), rather than the "pointed nodules" described by Ihle in *O. apiostomum*. The number of elements in the external leaf-crown unfortunately cannot be made out with certainty, owing to the mouth being full of débris. The oesophagus measures 0.94 mm. in length (as against 0.615 mm. in the male of *apiostomum*), and has a maximum thickness of 0.2 mm. (0.17 mm. in *apiostomum*). There is nothing worthy of remark in the form of the bursa or in the arrangement of its rays, which seems to be identical with that of *apiostomum*. The spicules measure about 2 mm. in length. (In *apiostomum* they are only 1.25--1.35 mm. long.)

Of the seven other species of *Oesophagostomum* recorded from Primates, besides *O. apiostomum* and *O. ovatum*, several have only been very briefly described, and only two, *O. brumpti* Railliet and Henry and *O. stephanostomum* Stossich, are at all well known. In *O. brumpti* the male measures only 6.7--11 mm. in length, and the spicules are only 0.9--1.08 mm. long. In *O. stephanostomum*, according to Railliet and Henry (1912), the male is of about the same size as the specimen here under discussion (17--22 mm. long), but the spicules measure only 1.38--1.475 mm., the cervical groove is considerably nearer (0.36--0.365 mm.) to the anterior end, and the buccal capsule is much shorter (0.022 mm.). *O. blanchardi* Railliet and Henry (1912, p. 572, footnote); from the Orang-

utan in Borneo, is said to have 16 elements in the leaf-crown, and spicules measuring up to 1.825 mm. in length, but is not further described, so that it is impossible to say whether it is distinct from *O. ovatum*.

SUBFAMILY DELETROCEPHALINAE.

DIAPHANOCEPHALUS Diesing, 1851.

DIAPHANOCEPHALUS sp.

A single female of a species of *Diaphanocephalus* was taken, together with *Tanqua tiara*, from *Varanus salvator* at Kuching.

CESTODA.

PSEUDOPHYLLIDEA.

FAMILY BOTHRIOCEPHALIDAE.

DUTHIERSIA Perrier, 1873.

DUTHIERSIA EXPANSA Perrier 1873.

Perrier, 1873, p. 359, pl. xvi, figs. 1-4.

Beddard, 1917, p. 80, figs. 2-4.

Several specimens of this curious species were collected from *Varanus salvator* at Kuching.

CYCLOPHYLLIDEA.

FAMILY ANOPLOCEPHALIDAE.

SUBFAMILY ANOPLOCEPHALINAE.

BERTIELLA Stiles and Hassall, 1902.

BERTIELLA ELONGATA Fuhrm., in Parona, 1900.

Taenia (Berthia) elongata Fuhrmann, in Parona, 1900, p. 5, *vide* Stiles and Hassall, *Index-Cat. Med. and Vet. Zool.*)

Bertia elongata Bourquin, 1905, p. 444, pl. viii, figs. 12-21; pl. ix, figs. 26-28.

Bertiella elongata Douthitt, 1915, p. 67.

A few specimens of this interesting species were collected from *Galeopterus temminckii** at Miri. A full description is given by Bourquin, under the heading "*Bertia elongata* Bourquin." The name *elongata* appears, however, to have been given to the species previously by Fuhrmann.

* The host is named *Galeopithecus volans* on the collector's label, but according to information kindly supplied by Mr. M. A. C. Hinton, of the British Museum (Nat. Hist.), this animal is confined to the Philippines, and the form found in Borneo is quite distinct from it.

FAMILY HYMENOLEPIDIDAE.

SUBFAMILY HYMENOLEPIDINAE.

HYMENOLEPIS Weinland, 1858.

HYMENOLEPIS LONGIOR Baylis, 1922.

Baylis, 1922, p. 2.

This species was hitherto only known from *Epimys rattus* and *E. norvegicus* in Great Britain. It is interesting to find it in a rat indigenous to Borneo, which shows that it probably has a wide geographical range.

CHITINOLEPIS nov.

CHITINOLEPIS MJÖBERGI, sp. n. (Figs. 7-8).

Host: *Rattus sabanus*. Locality: Mt. Dulit.

This species occurred together with *Railletina blanchardi*, in about equal numbers, in the large intestine of the host. The strobila attains a length of 13-17 cm., with a maximum width of about 2.5 mm. The scolex measures 0.34-0.43 mm. in width at its widest part, which is usually a little behind the suckers. There are four suckers, each somewhat raised on a squarish thickening of the scolex, and having a diameter of 0.12-0.15 mm. A rudimentary, unarmed rostellum is present, but in all the specimens examined it is completely invaginated within the scolex. In specimens in a fairly extended condition, the neck is unsegmented for a distance of about 0.7 mm. behind the scolex, and is narrower than the latter. The segments are much broader than long throughout the strobila. A strobila 13.5 cm. long contains over 1100 segments, fully mature segments beginning at about the 670th (the male organs are already functioning in more anterior segments), and gravid segments at about the 980th.

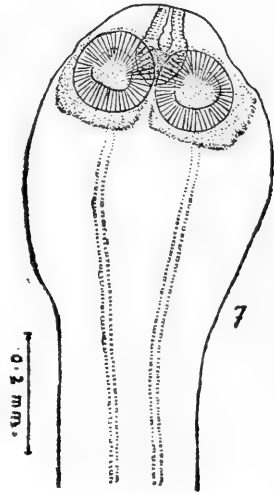


Fig. 7. *Chitinolepis mjöbergi*. Scolex; dorsal or ventral view.

The excretory system consists of the usual two pairs of longitudinal vessels, both lying in almost the same horizontal

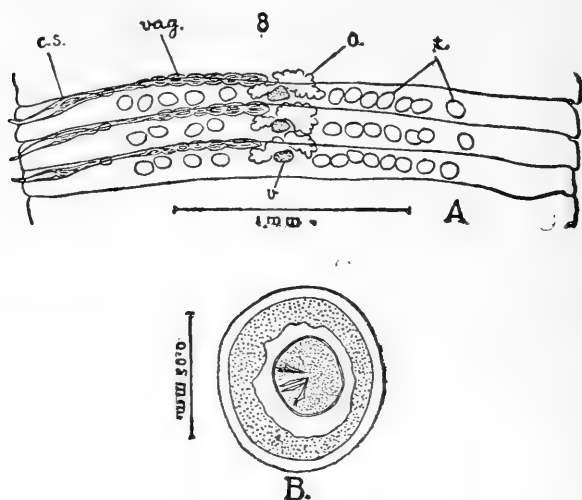


Fig. 8. *Chitinolepis mjöbergi*. A, semi-diagrammatic representation of three mature segments in ventral view, from a whole preparation; c-s, cirrus-sac; o, ovary; t, testes; v, yolk-gland; vag, vagina; B, an egg.

plane. Those which must be regarded as the ventral vessels are slightly wider than the others, and connected by narrow transverse intersegmental vessels. The genital pores are unilateral, on what appears to be the right side of the strobila. The genital ducts pass dorsally to both the longitudinal excretory vessels and to the longitudinal nerve of that side. The cirrus-sac is elongated and spindle-shaped, extending inwards a little beyond the nerve of the side. It measures 0.34-0.37 mm. in length, and has a maximum thickness of 0.40-0.06 mm., according to its state of contraction. It contains a long internal vesicula seminalis. There is also, connected with its inner end by a narrow duct, a pear-shaped external vesicula seminalis which, when full of spermatozoa, measures about 0.15 x 0.055 mm. The cylindrical cirrus is armed with minute spines. The vagina opens ventrally to the cirrus-sac.

In young mature segments it has a wide lumen, expanding somewhat towards its inner end to form a club-shaped receptaculum seminis just before reaching the female glands. In older segments almost the whole vagina serves as a receptaculum, and has a moniliform appearance owing to the inclusion of a series of spherical masses of spermatozoa.

The ovary is situated with its centre very slightly towards the pore side of the middle line. It has a transverse diameter of 0.3--0.35 mm., is deeply lobulated, and more or less clearly divided into two lateral masses, of which that on the aboral side is the larger. These masses curve posteriorly, embracing the compact yolk-gland, which lies behind the middle portion of the ovary and is transversely elongated, measuring about 0.1 x 0.06 mm. The number of testes in each segment varies between nine and twelve. These are arranged in a single row along the posterior border of the segment and between the dorsal longitudinal excretory vessels. In accordance with the position of the female glands, there are usually fewer testes (not more than six) on the pore side of the yolk-gland. The uterus persists as a transversely elongated sac with irregular walls, extending across nearly the whole width of the gravid segment. The ova have thick, finely-granulated, pale brownish outer shells measuring about 0.065 mm. in diameter. The onchosphere is closely surrounded by an inner shell measuring 0.03--0.0375 mm. in diameter. The embryonic hooks are 0.012--0.015 mm. in length. Between the two shells of the egg is a mass of finely-granular, probably albuminous, material, which sometimes gives rise to the appearance of a third shell or membrane, as in *Hymenolepis*.

The systematic position of this species is rather difficult to determine. Some of its characters are suggestive of affinities with the *Anoplocephalidae*. The presence of a rostellum, however, even though rudimentary, seems to indicate that it does not belong to that family. The only other family to which it could be referred seems to be the *Hymenolepididae*. In most of the genera included in this family the rostellum is either armed or absent. In *Hymenolepis*, however, it is sometimes present in a rudimentary and unarmed condition. Further, *Hymenolepis* and the other genera included in the subfamily *Hymenolepidinae* have invariably a persistent sac-like uterus. There appears to be no bar to the inclusion of *Chitinolepis* in this subfamily, though it could not be referred

to either of the other groups (*Dipylidiinae* and *Paruterininae*) into which the *Hymenolepididae* have been divided. The genus is therefore referred provisionally to the *Hymenolepidinae*. The exceptional thickness of the outer shell of the eggs is remarkable, and is a feature rather reminiscent of the *Taeniidae*.

SUBFAMILY DIPYLIDIINAE.

ANOMOTAENIA Cohn, 1900.

ANOMOTAENIA MURUDENSIS sp. n.

Host : *Garrulax schistochlamys* (a Laughing-thrush). Locality : Mt. Murud.

The material of this species is in a somewhat unsatisfactory condition, and will only be very briefly described. The strobila is very muscular, and the specimens are much contracted. The length of the longest is about 22 mm., and the maximum width attained is about 2 mm. The scolex has a transverse diameter of 0.37-0.43 mm. The suckers measure 0.12-0.16 mm. in diameter, and the rostellum 0.12-0.19 mm. The latter bears two alternating crowns of powerful hooks, having about 20 or 22 hooks in each. The hooks measure 0.05-0.055 mm. in length. In mature segments there are 35-45 testes, grouped behind and at the sides of the female glands. The genital pores are irregularly alternating, situated near the anterior border of each segment and usually overlapped by the hinder edge of the preceding segment. The cirrus-sac measures about 0.15 x 0.05 mm. The cirrus is covered with minute spines. The gravid segments are almost entirely filled by the sac-like uterus. The onchospheres measure about 0.028 mm. in diameter and are enclosed in two thin shells.

Anomotaenia dehiscens (Krabbe, 1879) appears to be the only *Anomotaenia* recorded from a bird of the family (*Timeliidae*) to which *Garrulax* belongs. This is a very much smaller form, with hooks only 0.012 mm. long. The following species occur in birds more or less distantly related to the above-mentioned family, but the form here described is readily distinguished from them by the size of its hooks alone:—*Anomotaenia constricta* Molin, *A. trigonocephala* Krabbe, *A. borealis* Krabbe, *A. quadrata* Rud.

FAMILY DAVAINIIDAE.

SUBFAMILY DAVAINIINAE.

RAILLIETINA Fuhrmann, 1920.

SUBGENUS PARONIELLA Fuhrmann, 1920.

RAILLIETINA (PARONIELLA) BLANCHARDI (Parona, 1898).

Davainea blanchardi Parona, 1898, p. 2, pl. i, figs. 1-8.

This species occurred together with *Chitinolepis mjobergi* in *Rattus sabanus* at Mt. Dulit. The two forms are of much the same size and at the first glance not easy to separate. Complete specimens, however, can be distinguished by the great difference in the shape of the posterior segments, which in *R. blanchardi* ultimately become longer than broad. *R. blanchardi* was originally recorded from *Mus siporanus* and *M. rajah*.

RANSOMIA Fuhrmann, 1920.

RAILLIETINA (RANSOMIA) INSIGNIS (Steudener, 1877).

Taenia insignis Steudener, 1877, p. 298, pl. xxxi, figs. 1-7.

Davainea insignis Blanchardi, 1891, p. 434, fig. 12.

This species occurred in considerable numbers in *Ducula badia* at Mt. Murud. It has been recorded from *Globicera* [*Carpophaga*] *oceanica*, to which the present host is closely related. There are also in the British Museum specimens which probably belong to it from *Treron delandii*, from East Africa.

RAILLIETINA (RANSOMIA) CALYPTOMENAE sp. n.

Host: *Calyptomena whiteheadi* (a Broadbill). Locality: Mt. Murud.

The strobila (in the preserved material) attains a length of 6-10 cm., and a maximum width of 0.9-1.15 mm. The diameter of the scolex is 0.17-0.25 mm. The suckers measure 0.055-0.08 mm. in diameter, and are armed with minute spines. The rostellum has a diameter of 0.1-0.125 mm., and is armed with very numerous hooks, arranged in two irregularly alternating rows and measuring about 0.008 mm.

in length. The specimens are in a somewhat contracted condition, so that the neck appears short. The segments are very numerous, and for the most part are broader than long (much broader in contracted specimens). The gravid segments, however, become square, and finally, in some specimens, slightly longer than broad. The subcuticular and muscular layers are well-developed. The medullary parenchyme occupies not much more than one-third of the width of the strobila. The genital pores are unilateral (on the right side), and situated a little in front of the middle of the lateral borders of the segments. There is a small muscular genital atrium. The cirrus-sac is relatively large, measuring about 0.16 mm. in length and 0.055 mm. in greatest thickness. It curves forward from the pore, its inner end nearly reaching the anterior border of the segment. The cirrus is very muscular. The ovary is distinctly divided into two lateral masses, which form a triangle with the large yolk-gland, situated posteriorly. The testes are relatively large, apparently only five in number, immediately surrounding the female glands behind and at the sides, but more dorsal in position. The uterus, at first a sac, breaks down into egg-capsules, each of which contains about eight eggs. The capsules are confined to the space between the wide and conspicuous longitudinal excretory vessels.

This species differs from the great majority of forms in the Subgenus *Ransomia* in its small number of testes. There are, however, certain species resembling it in this respect. *R. (R.) mutabilis* Rüther has, according to Fuhrmann (1920), only one testis per segment; *cacatuina* (Johnston, 1911) has four or five; *oligorchida* (Fuhrm., 1911) has five or six; and *paucitesticulata* (Fuhrm., 1909) has six or seven. Of the three last-mentioned forms, *cacatuina* and *paucitesticulata* show a very close resemblance to the species just described, but both are evidently smaller forms, and nearly all the measurements given for them are considerably less than the corresponding figures for *R. calyptomeneae*. In *R. paucitesticulata* the rostellar hooks are larger (0.012--0.014 mm.), and the cirrus-sac considerably smaller (0.07--0.088 mm. long). In addition, it may be mentioned that *R. paucitesticulata* occurs in a pigeon, while *cacatuina* and *oligorchida* occur in Psittaciform birds. The writer is unable to find records of any Cestodes from birds of the group (Eurylaemidae) to which the present host belongs.

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XIX.—Planaires Terrestres de Sarawak.

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(With one Plate.)

INTRODUCTION.

Les Triclades Terricoles qui font l'objet de ce travail m'ont été adressés par Mr. le Dr. Mjöberg, alors Curateur du Musée de Sarawak, qui les avait récoltés. Je lui dois des remerciements spéciaux pour m'avoir autorisé à tronçonner les échantillons même uniques pour dé biter en coupes la région copulatrice, dont l'étude constitue la partie de beaucoup la plus importante de mes descriptions. L'investigation anatomique, au moins de l'appareil copulateur, est en effet absolument indispensable pour caractériser un Turbellarié. Malgré la variabilité des dessins et des couleurs, passablement conservées dans l'alcool, dont font foi les magnifiques planches de von Graff, auxquelles nous renverrons à chaque instant (ou plutôt en raison même de cette variabilité), on ne peut se fier à eux pour une identification sûre : dans les cas trop rares où une étude parallèle a été faite, on a constaté qu'ils pouvaient être très différents dans des formes identiques par l'appareil génital (voir notamment de Beauchamp 1912), et que d'autre part des formes similaires extérieurement pouvaient être très différentes anatomiquement.

Du reste la complication et les variations exubérantes de l'appareil copulateur chez tous les Turbellariés posent elles

aussi de curieux problèmes biologiques : quand on voit deux espèces en apparence voisines et de moeurs analogues présenter l'une un pénis très long et très différencié, l'autre une absence complète de cet organe, compensée ou non par des complications inédites des réservoirs et des glandes accessoires, on se demande quelle est l'utilité réelle de ces structures pour la multiplication de l'espèce, et quel a été le mécanisme de leur acquisition..... La convergence arrive d'autre part à reproduire des dispositions fort analogues dans des groupes très éloignés, et les genres et coupures supérieures ne peuvent non plus être fondés exclusivement sur l'appareil copulateur. Aussi a-t'on jusqu'ici chez les Triclaes été obligé d'en conserver de fort vastes avec une définition assez vague.

Au point de vue pratique d'ailleurs les spécimens étudiés anatomiquement ne sont pas perdus pour la conservation et l'examen ultérieur : les tronçons subsistants permettent de se rendre compte de l'ornementation, et les séries de coupes, qui retourneront bien entendu au Musée, serviront à quiconque voudra vérifier les faits allégués et les comparer à de nouveaux spécimens.

D'après ce que nous venons de dire, on conçoit qu'il faille être très prudent dans la comparaison avec d'anciennes descriptions basées uniquement sur les caractères extérieurs, qui sont par malheur de beaucoup la majorité, comme dans l'attribution des exemplaires non sexuellement mûrs. J'ai pris pour règle dans ce travail de ne faire une telle identification qu'en cas d'identité absolue d'une ornementation caractéristique, ou si l'espèce était déjà connue de Bornéo, ce qui m'a amené à décrire dans ma note préliminaire (1925) toutes les espèces comme nouvelles sauf 3 (dont une seule déjà connue anatomiquement); je vais cette fois indiquer pour chacune les formes antérieurement connues dans les régions voisines dont elles se rapprochent et avec lesquelles l'identification pourra peut-être avoir lieu ultérieurement par l'étude anatomique de matériaux d'autre provenance.

Ceci limite considérablement le champ des considérations biogéographiques. En 1899, von Graff ne relève comme signalées à Bornéo que 5 Planaires terrestres, dont 3 non identifiables (on verra que j'ai pu repêcher une de celles-ci et retrouver une des autres), contre 16 à Sumatra, 40 à Java qui a été spécialement étudié grâce au Jardin de Buitenzorg, 94 pour

la région Indo-Malaise *sensu stricto* et 120 pour la province orientale en totalité. A ma connaissance il n' a été ajouté depuis lors à la faune de Bornéo, avant les 6 dont il va s'agir, que 2 espèces de Jos. Muller (1902), dont j'ai retrouvé l'une, et la disproportion avec les contrées voisines serait encore plus considérable. D'autre part aucune n'a été signalée hors de la grande île, ce qui indiquerait un endémisme considérable... En réalité, ceci prouve simplement, d'une part qu'on n'a guère cherché de Planaires à Bornéo, d'autre part que beaucoup de formes décrites dans telle ou telle île où elles offrent une ornementation distincte seront peut-être reconnues comme identiques quand on aura pu comparer anatomiquement des matériaux de provenance différente ; nous verrons que certaines des miennes se rapprochent beaucoup d'autres espèces Indo-Malaises auxquelles je n'ose formellement les identifier (inversement d'ailleurs certaines identifications d'une île à l'autre faites par Graff et d'autres sur l'extérieur seul sont à revoir).

En somme, pour pouvoir traiter sérieusement la répartition d'un groupe de Triclares terrestres, subdiviser rationnellement les genres actuels beaucoup trop étendus, et en reconstituer la phylogénie et les migrations, il faudrait avoir exploré d'assez près un vaste domaine comme les îles de la Sonde pour être sûr de posséder la majorité des espèces et comparer extérieurement et anatomiquement tous les spécimens entr'eux pour définir avec précision l'espèce, ses variations et ses affinités avec ses voisines.....Travail du plus haut intérêt, mais énorme et fastidieux vu le temps nécessaire pour la confection et l'examen des séries de coupe dans des animaux de grande taille. Du même coup l'on fixerait l'étendue des modifications des caractères suivant l'âge et surtout le degré de maturité sexuelle, donnée dont l'absence est fort gênante pour l'emploi systématique de l'appareil copulateur. En attendant, nous en sommes réduits à des considérations de détail.

La technique n'a rien présenté de particulier ; le matériel, conservé simplement dans l'alcool dénaturé, était en général en bon état, mais ne se prêtait pas aux finesse histologiques. La coloration à l'hémalum-éosine (de préférence avec addition d'orange G) répond à tous les besoins, et en particulier à la distinction des glandes érythrophiles et cyanophiles des auteurs, que pour abrégé j'appellerai simplement glandes rouges et

glandes bleues; l'hématoxyline ferrique dont l'électivité à ce point de vue n'est pas exactement celle de l'hémalun n'est utile que dans des cas particuliers.

L'illustration comporte, à défaut de figures en couleur, des croquis au trait ou au lavis qui donneront une idée suffisante de l'ornementation; les figures d'appareil copulateur sont des coupes sagittales schématisées en ramenant dans le plan médian tous les organes impairs ♂ et ♀ qu'il n'intéresse jamais en entier, mais en conservant tous les détails figurables à l'échelle employée (les fibres musculaires en trait simple, les épithéliums et les glandes en trait double en général, les gl. bleues seules ponctuées); de plus certains organes non médians ont été projetés sur la coupe en trait fort ou en pointillé suivant le cas.

GENRE BIPALIUM Stimpson.

Ce genre, qui compte actuellement plus de 125 espèces¹ (la valeur de la plupart, non définies anatomiquement, est d'ailleurs à vérifier) est fort intéressant par sa répartition, qui embrasse à la fois toute la province orientale de l'Inde à Célèbes et au Japon et la province Malagache, tandis qu'il ne pénètre pas dans l'Afrique continentale et ne franchit pas à l'E. la ligne de Weber (voir sur les rapports des différentes parties de l'Océanie au point de vue des Planaires terrestres le travail récent de Schröder). Il n'est d'ailleurs défini que par un caractère extérieur, la dilatation de l'extrémité céphalique en une plaque plus ou moins arrondie ou falciforme, mais se caractérise l'oppose nettement à tous les autres Triclades Terricoles. Les tentatives faites pour le subdiviser d'après la forme de cette plaque et du reste ont dû être abandonnées quand on a constaté, postérieurement à la monographie de von Graff, que les variations de l'appareil copulateur ne se faisaient pas parallèlement (voir Joseph Müller, 1902 et 1907), et *Placocephalus* et *Perocephalus* placés en synonymie.

BIPALIUM MOSELEYI Loman. (Fig. 1 et pl. fig. 1--3.)

Cette espèce se présentait dans mon matériel en 7 exemplaires, provenant tous du Mt. Murud, 5500 à 6300 pieds, mais répartis en deux variétés, l'une concolore, l'autre d'un dessin caractéristique, dont j'aurais certainement fait deux espèces

¹ Je n'ai pu me procurer le travail de Frieb (1923) et ne sais s'il renferme des données nouvelles.

sans l'identité d'un appareil copulateur unique dans la série des Triclades. Dans la première, le seul individu sexué mesurait 115 mm. de long sur 8 de large, et 3 d'épaisseur la tête grande et très échancrée en arrière est large de 12. La teinte est un brun assez clair tout à fait uniforme sauf des excoriations de l'épiderme qui tranchent en clair; le ventre est à peine moins foncé, avec la sole pédieuse blanc jaunâtre. occupant à peu près le quart de sa largeur. La bouche est à 50 mm. de l'extrémité supérieure, le pore génital à 22 plus bas. Les 3 autres, que j'ai coupés successivement sans les trouver sexués, mesurent chacun : 100 mm. environ sur 8 de large (12 pour la tête), bouche à 45, bourrelet frontal plus clair--37 mm. sans l'extrémité inférieure qui manque, sur 7, tête 7, 5, bouche à 22, teinte un peu plus foncée, appariel copulateur partiellement développé--90 mm. sur 7, tête 9, bouche à 46, individu ayant été partiellement desséché, racorni et couvert d'efflorescences.



Fig. 1. *Bipalium Moseleyi*, coupe sagittale schématique de l'appareil copulateur à un stade jeune.

La seconde variété comporte un premier individu très replié sur lui-même, ce qui empêche de situer les orifices, long d'environ 95 mm., large de 6 (10 pour la tête qui a la même forme que précédemment, pl. 13, fig. 1). La teinte de fond est un jaune rougeâtre, beaucoup plus clair que dans l'autre variété, mais le dos est marqué de 4 raies longitudinales noires, deux submarginales larges, deux submédianes beaucoup plus fines qui s'écartent, puis s'effacent dans le bas; en plus, de petites taches noires irrégulièrement éparses sur tout le fond. Sur la tête, les raies divergent et s'estompent, la teinte de fond devient plus grise. Ventre plus clair. Ce premier individu a fourni une série de coupes frontales de la région copulatrice. Le second, long d'environ 85 sur 8, tête 10, a une teinte un peu plus foncée, les raies submarginales plus larges, les submédianes manquent mais les petites taches, plus nombreuses, empiètent sur la face ventrale; la bouche est à 43 mm., le pore génital à 14 plus bas. Enfin le troisième, contourné et brisé, a environ 80 sur 7, tête 11, les bandes submédianes manquent aussi, mais la teinte de fond est plus grise; il a fourni des coupes sagittales.

La position des yeux est sensiblement la même dans tous¹ : bande marginale très dense qui s'éparpille en bas sur les oreillettes, amas encore plus serré et d'yeux plus gros à la jonction de celles-ci et du cou, qui se prolonge seul à la face ventrale et se continue sur les côtés du corps. L'espèce a été décrite par Loman (1888, p. 65, pl. 1, fig. 1) sur un seul exemplaire provenant de l'E. de Bornéo ; il appartient à la variété concolore, mais devait présenter, dans la partie inférieure, 3 raies noires que Graff n'a pas retrouvé en examinant ce spécimen resté unique (1899, p. 442) ; il en rapproche probablement avec raison son *B. Jansei* de Buitenzorg (p. 443, pl. xii, fig. 30--31), fondé également sur un échantillon unique et non étudié anatomiquement, et qui présente une ornementation très analogue à celle de notre seconde variété, sauf la présence d'une raie médio-dorsale (dont il existe d'ailleurs une ébauche dans un de nos individus, voir la figure). Le *B. marginatum* Loman (Graff, p. 419, pl. xii, 164 et xix, 21--22), espèce mieux connue, de Java et Célèbes, a aussi une ornementation du même type, mais l'anatomie ne permet pas de les confondre.

En effet, comme je l'ai fait connaître, *B. moseleyi* se caractérise par une vésicule séminale énorme, remplissant toute la longueur entre la gaine du pharynx et le pénis, par contre rudimentaire (12 mm. dans le premier individu cité, soit plus du dixième du corps) et recevant les canaux déférents ramifiés par une série d'orifices latéraux, cas unique à ma connaissance chez les Terricoles et même chez les Triclades. Elle forme (pl. 13, fig. 2) un boudin régulièrement cylindrique, arrondi aux deux bouts, d'apparence rigide grâce à son épaisse gaine musculaire ; les fibres de celle-ci forment un plexus serré où l'on distingue deux directions obliques entrecroisées ; les plus périphériques, qui touchent presque celles de la paroi du corps, s'orientent longitudinalement et se prolongent vers l'atrium et l'oviducte glandulaire, ébauche d'une musculature génitale commune fort peu développée. En dedans l'épithélium papilleux de la vésicule, qui forme des crêtes annulaires, au moins les plus grandes, de sorte que sur une coupe non médiane elle paraît divisée en compartiments successifs assez irréguliers.

¹ Dans les fig. 1, 4, 7, 8 de la planche, la position des yeux a été indiquée pour en épargner d'autres ; il va dans dire que ces yeux sont trop gros et trop peu nombreux par rapport à l'échelle, et qu'ils sont beaucoup plus visibles que dans la réalité sur un spécimen non éclairci.

Cet épithélium consiste (fig. 3, pl. 13, *cg*) en petites cellules serrées, couvertes de longs cils, et chargées de très petits grains prenant l'hématoxyline, qu'on retrouve dans la lumière; il ne paraît pas y avoir de glandes extrinsèques. Dans le très court canal éjaculateur proprement dit, qui traverse le pénis, les cellules sont basses et sans inclusions.

Les canaux déférents descendent de chaque côté ventralement jusque vers le milieu de la vésicule. Là chacun se bifurque en deux branches, l'une récurrente, l'autre atteignant le rétrécissement terminal, et celles-ci, accolées à la tunique musculaire, se partagent en un certain nombre de rameaux qui se portent en dedans et dorsalement à travers elle et débouchent dans des culs de sac de l'épithélium (fig. 3, *cd*). Le nombre et le détail des ramifications varient d'ailleurs d'un individu et même d'un côté à l'autre; il y avait 9 orifices de chaque côté dans l'individu de la variété concolore, 7 dans les deux de l'autre, mais dans l'un de ceux-ci un 8^o vers le bas d'un seul côté, se terminant en cul de sac dans le conjonctif sans rejoindre le canal déférent, ce qui indique la possibilité d'une atrophie. Dans le même individu une légère dilatation au point de partage du tronc principal formait une "fausse vésicule séminale" fréquente chez les Triclades. Toutes les parties des canaux ont un épithélium haut, cilié, et une musculature propre de fibres circulaires et entrecroisées.

L'atrium ♂, tout à fait séparé de l'atrium commun, est piriforme et s'y ouvre sur un tubercule génital saillant par un canal très étroit pourvu d'une gorge circulaire qui permet sans doute la dévagination. Son épithélium est haut, papilleux, très colorable mais sans inclusions, entouré d'une musculature circulaire bien développée; elle se prolonge en s'amincissant, avec les fibres de la vésicule, dans le pénis, simple papille de l'atrium.¹ Sur le tubercule génital l'épithélium est peu visible, probablement du type dit en allemand "eingesenkt" (à corps cellulaires enfoncé dans la profondeur) mais criblé de glandes rouges, tandis que sur le reste de l'atrium commun il est bien développé et recoit en majorité des glandes bleues.

¹ Un des individus de la seconde variété présentait une distension énorme de la partie inférieure de la vésicule qui faisait même saillie à la surface du corps, paraissant due à un gonflement de son contenu lors de la fixation, elle avait produit l'effacement des papilles et même de la saillie pénienne, tandis que l'orifice ♂ était très saillant.

L'ootype (je me décide à prendre ce mot, usité dans d'autres groupes de Platodes, plutôt que celui d'oviducte glandulaire commun rendant le "Drüsengang" des auteurs allemands) est ici un réservoir spacieux, en forme de toupie, avec un cul de sac terminal recevant les deux oviductes; son épithélium est formé de cellules très hautes et serrées, très colorables par l'hématoxyline, avec des noyaux à toutes les hauteurs; il est de plus traversé par la sécrétion des glandes coquillières rouges, du reste moins nombreuses que dans d'autres espèces. Il se prolonge dans le col qui débouche sur le tubercule génital, séparé de l'orifice par une crypte où les glandes rouges sont extrêmement nombreuses. L'ootype a une musculature circulaire propre, et autour le plexus commun qui pénètre dans le tubercule.

La vésicule séminale de *B. moseleyi* est comme nous l'avons dit quelque chose d'absolument spécial; l'espèce qui s'en écarte le moins est *B. marginatum*, d'ailleurs voisin par l'ornementation, qui présente (Graff, fig. 61, p. 213) un canal éjaculateur dilaté (mais sinueux dans le plan frontal) entouré d'une épaisse musculature et revêtu d'un épithélium papilleux. Mentionnons aussi les formes comme *B. Wiesneri* Graff (J. Müller 1907, pl. xix, fig. 4--5), où le canal est entouré sur une partie de sa longueur de cryptes à glandes extrinsèques, qui tirent sans doute origine de simples culs de sac. Mais dans les deux cas les canaux déférents aboutissent simplement au fond du canal ou vésicule séminale, et il n'y a aucune ébauche de leur ramification.

Il est très intéressant de comparer à cet appareil copulateur complexe son stade jeune que m'a fourni un individu de la seconde variété (fig. 1, texte). Il présentait un atrium commun ouvert à l'extérieur, un ootype peu dilaté avec ébauche de musculature, un atrium ♂ déjà papilleux. Mais dans la papille pénienne, aussi développée que chez l'adulte quoique terminée en vésicule close, ne débouchait qu'un court canal éjaculateur à épithélium haut, entouré d'un bulbe arrondi et formé par la réunion de deux canaux déférents décrivant leur anse habituelle. Bref la disposition moyenne des *Bipalium* peu différenciés (voir ci-après); on n'aurait pu soupçonner son rapport avec celle de l'adulte sans l'identité extérieure complète de spécimens provenant de la même station; il est vrai que tout l'espace entre le pharynx et les caecums digestifs inférieurs n'est occupé que par du parenchyme, réservant en quelque

sorte la place future de la vésicule. Ceci nous montre que l'acquisition de ces particularités doit être récente dans la phylogénie, et aussi qu'il est imprudent de comparer des animaux à des degrés de maturité différents.

BIPALIUM EVERETTI Moseley. (Fig. 2 et 3.)

Cette espèce est représentée par un individu du Mt. Poi, 5350 pieds, et trois du Mt. Penrissen, 4000 pieds. Le premier mesure 51 mm. sur une largeur de 6 et une épaisseur de 3; la tête est courte, à peine échancrée latéralement, large de 5, 5. La couleur est rouge brique, ventre un peu plus clair avec sole blanc jaunâtre, large de 2. Sur la tête se détachent en noir une bande marginale mince, mais élargie au milieu et une bande nucale un peu plus large à la jonction du corps. Celui-ci est marqué de 6 paires de taches noires régulièrement espacées, s'allongeant vers la ligne médiane sans l'atteindre et débordant plus ou moins sur la face ventrale; toutes sont bordées d'un liseré plus clair que le fond; la dernière est très rapprochée du bout, qui porte une petite tache noire. La bouche est à 23 mm. de l'extrémité supérieure, entre les 2^o et 3^o paires, le pore génital à II au-dessous, au niveau de la 4^o.

Des trois autres, le plus grand (43 mm. sur 6) est ratatiné et incomplet le bout manque avec la dernière paire de taches, la bande marginale n'a pas d'épaississement, la nucale est plus large; la bouche est à 19 mm., le pore à 14 d'elle. Le second, qui est représenté ci-contre (fig. 2) et a fourni la série de coupes, mesure 34 x 5.5, a les bandes marginale et nucale minces, les taches de la 1^o paire s'effilent jusqu'à se toucher. La bouche est à 14, le pore en est à 6. Le dernier enfin n'a que 24 sur 4, 5, la teinte est un peu plus claire, la tête comme dans le précédent, mais les taches se rejoignent sur la ligne médiane, sauf 4 et 5, les 6^o sont fusionnées entr'elles et avec le bout noir. Bouche à 11, 5, pore à 4, 5.

Les yeux sont répartis sur toute la moitié frontale de la tête, bien qu'en partie masqués par le pigment, et peu développés à ses angles inférieurs.



Fig. 2. *Bipalium Everetti*, vue dorsale de l'individu ayant fourni les coupes, x2.

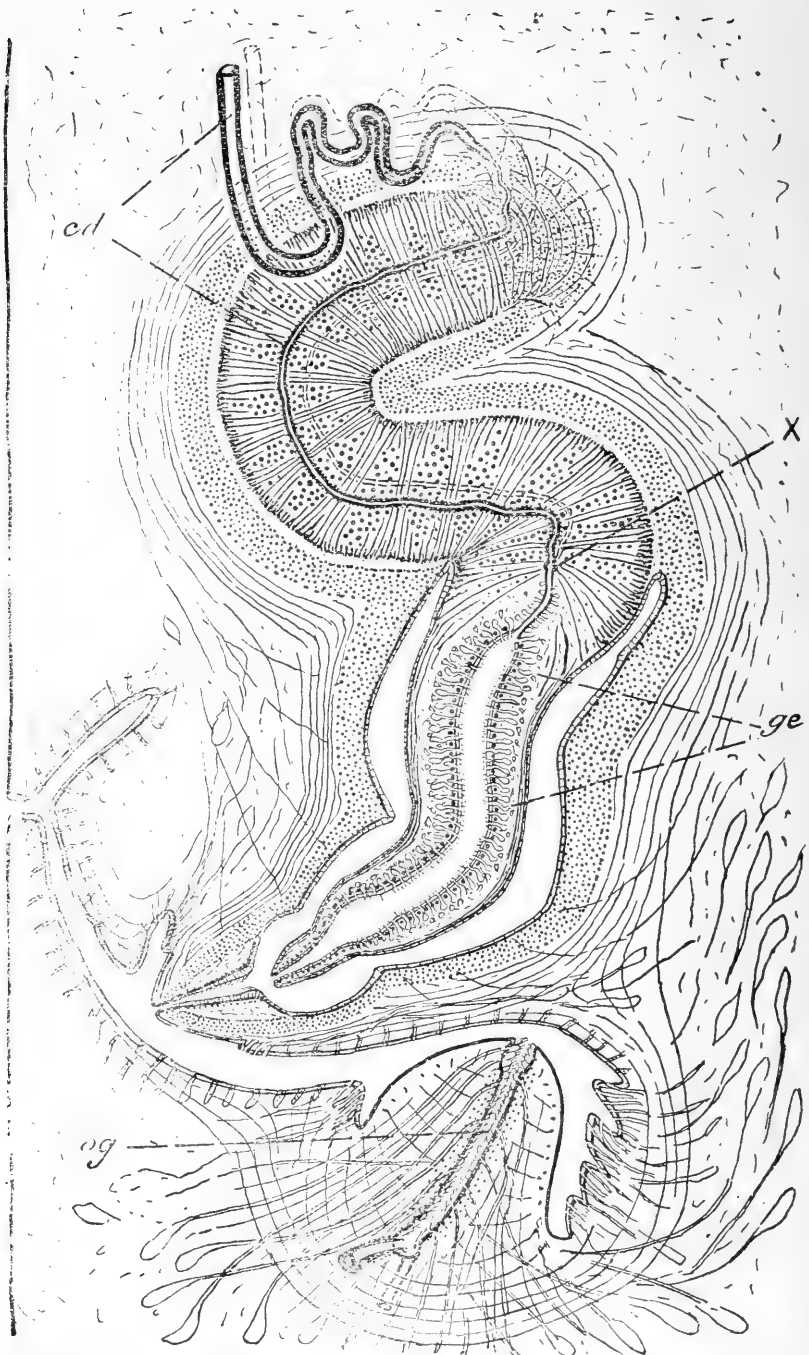


Fig. 3. *Bipalium Everetti*, coupe sagittale schématique de l'appareil copulateur.

L'histoire de cette espèce est curieuse : en 1870 Houghton communiqua à la Société Royale de Londres deux mauvais croquis de Planaires qui lui avaient été envoyés de Sarawak par A. H. Everett; Moseley en 1875 (p. 108) crea pour eux les noms de *Bipalium everetti* et *B. houghtoni*; Graff par la suite (p. 254) les rangea dans les formes non reconnaissables. Pourtant la fig. 1 de Houghton, qui représente un individu pitoyablement déformé et tordu, montre nettement les marques caractéristiques, et le texte spécifie la teinte de fond orangée. les taches noires bordées de jaune clair. Il est donc légitime de reprendre ce nom, juste hommage aux premiers qui ont récolté des Planaires à Sarawak. De nombreuses autres espèces montrent aussi des bandes transversales ou des séries de taches paires, mais il s'agit le plus souvent de marques claires sur fond sombre; la plus voisine semble *B. simrothi* Loman (Graff, p. 456, pl. ix, fig. 27--31), où si l'on suppose les parties claires de la fig. 27 encore élargies on arrivera à un dessin assez rapproché du nôtre. Il provient d'ailleurs des îles Natuna, à l'W. de Bornéo, ainsi que le *B. natunense* Meixner (1906 p. 668), où il y a au contraire réduction des parties jaunes à des taches paires. Il faut attendre de connaître l'appareil copulateur de ces formes pour le comparer à celui, très caractéristique, qui va être décrit.

Ses traits essentiels (fig. 3, texte¹) sont le pénis long et précédé d'un bulbe aussi long, et l'ootype court débouchant sur une papille orientée dorsalement. Les deux canaux déférents, après avoir décrit comme d'habitude une circonvolution à la base du bulbe, s'amincissent brusquement pour parcourir côte à côte son long boudin musculaire, concave dorsalement dans l'individu considéré, et ne se réunissent qu'au niveau de la base du pénis propre, en un canal éjaculateur qui s'élargit presque aussitôt et parcourt celui-ci jusqu'à son effilure terminale. Par un court canal (qui n'était pas complètement perforé dans mon exemplaire) l'atrium ♂ qui l'entoure débouche dans l'atrium commun sur une petite papille entourée d'un bourrelet. Beaucoup plus dorsalement et à gauche fait saillie dans celui-ci en sens inverse une autre papille, ébauche de "pénis ♀" comme en possèdent certains Triclades, en-

¹ Voir sur l'explication de la planche les lettres communes à toutes les figures.

tourée aussi de replis et dirigée vers la ligne médiane, où s'ouvre un ootype non dilaté. Donc pas de tubercule génital commun.

Une musculature d'ensemble très développée entoure toute la région copulatrice, formée de fibres longitudinales dans l'ensemble dont quelques-unes deviennent radiaires; en dedans sur la partie ♂ une couche circulaire très serrée, dont les noyaux sont en dehors, qui entoure directement l'atrium mais est séparée du boudin bulbaire par une strate conjonctive. Le boudin lui-même n'a pas une structure concentrique, mais est formé de segments successifs à fibres transversales, croisées de l'un à l'autre et divergeant à la périphérie, d'où l'aspect tout particulier de la coupe sagittale (fig. 3); aux extrémités ces segments se cintrent en coupole; les noyaux sont disposés en une seule couche subpériphérique que suivent les canaux déférents. Nous retrouverons cette disposition particulière dans les deux suivants. Dans le pénis lui-même, parenchyme clair avec quelques fibres longitudinales à la périphérie, circulaires autour du canal.

Dans la traversée du bulbe les canaux déférents, entourés dans leur partie libre de muscles circulaires, ont un diamètre très faible et un épithélium très bas; ces caractères subsistent sur le début du canal éjaculateur qui se couvre d'une mince couche glandulaire. Mais aussitôt dans le pénis, il se dilate et s'entoure d'un manchon épais de glandes rouges; l'épithélium devient cylindrique et nettement cilié. L'atrium ♂ a un épithélium bas, paraissant sécréter quelques grains rouges, vacuolaire et très altéré à la surface du pénis, et qui dans le rétrécissement aboutissant à l'atrium commun (canal copulateur) devient au contraire haut et cilié. Tout l'atrium commun, dont le fond est la partie ♀ n'a pas de musculature propre et son épithélium bas, mal conservé, "eingesenkt" à la surface de la papille est traversé par les nombreuses glandes bleues et rouges du parenchyme. Les premières sont surtout développées près de l'orifice externe, mais quelques unes aboutissent aussi au fond, tandis que les bourrelets des deux papilles reçoivent une quantité énorme des secondes. Le canal de l'ootype, non renflé et nettement cilié ainsi que les oviductes qui le forment, reçoit bien entendu les nombreuses glandes coquillières éparses tout autour; la papille elle-même renferme un plexus de muscles surtout circulaires à la périphérie et

radiaires en dedans. Cette description ne rappelle aucune de celles antérieurement données : *B. virile* J. Müller (1902, pl. v, fig. 1) est presque seul à présenter un long boudin musculaire, mais le canal éjaculateur y est impair et le pénis très réduit ; la topographie de la partie ♀ est aussi très particulière. Au contraire les rapports sont intimes avec l'espèce suivante.

BIPALIUM CHORISTOSPERMA de Beauchamp. (Fig. 4, et pl. fig. 4-6.)

L'individu unique ne portait que la mention "headquarter, October," il est de forme trapue et épaisse : longueur 29 mm., largeur 8, épaisseur 2, 5 (pl., fig. 4). La tête est large de 5 seulement, mais bien individualisée, un peu pointue, surtout par le fait de plis formés par le rebord, et détachée en oreillettes à la base ; l'aspect rappelle un peu le Paludicole *Planaria gonocephala* à l'état fixé. La teinte de fond est brun rougeâtre avec une raie médio-dorsale mince, jaune clair, bordée de noir, qui s'effile jusqu'au milieu de la tête ; celle-ci est gris foncé, avec un bourrelet marginal blanc, les yeux forment une bande marginale assez large tout autour. La face ventrale est de même couleur que la dorsale, avec sole blanche et large de 1.5 mm. La bouche est à 9 mm. de l'extrémité, le pore à 5 plus bas.

Cet aspect ne rappelle guère que le *B. modiglianii* Graff (p. 437, pl. xiii, fig. 28), de Sumatra dont la tête est plus large et la raie non bordée de noir ; le *B. weissmanni* Ritter-Zahony (1905, p. 177, pl. 1, fig. 6) de Java a aussi une similitude de forme, et le schéma de l'appareil copulateur, fait d'après un individu imparfaitement mûr (pl. ii, fig. 9) ne s'écarte guère de la topographie du nôtre bien que n'indiquant pas les détails plus caractéristiques. Mais c'est avec *B. everetti* que cette espèce—qu'on ne songerait jamais à en rapprocher par l'aspect extérieur—présente les affinités les plus étroites.

L'appareil copulateur (fig. 4, texte) a en effet une disposition tout-à-fait similaire ; le boudin bulbaire est identique. Mais le pénis est proportionnellement plus court et conique, les canaux déférents restent distincts dans presque toute sa longueur (d'où le nom spécifique) et subissent indépendamment la dilatation brusque et l'adjonction du manchon glandulaire ; il serait peut être plus juste de dire qu'il y a deux canaux éjaculateurs (*ce* fig. 4, texte et 5 pl.) qui ne confluent qu'à la pointe (x).

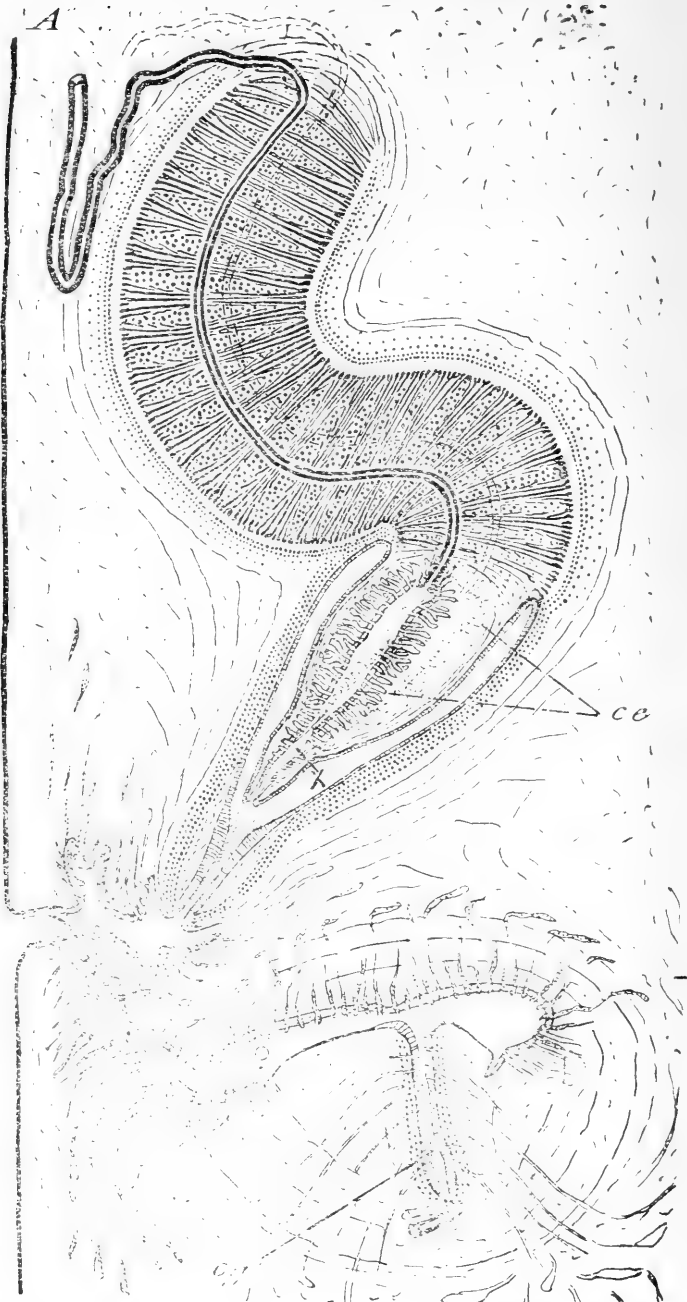


Fig. 4. *Bipalium choristosperma*, coupe sagittale schématique de l'appareil copulateur.

La séparation complète des deux spermiductes est unique chez les *Bipalium* et très rare chez les Tricladés. Les détails histologiques ne diffèrent guère de l'autre espèce (les canaux éjaculateurs ne paraissent pas ciliés). Mais, ce que le schéma 5 ne peut rendre, l'asymétrie générale est très marquée : l'appareil ♀ est tout-à-fait à gauche de l'appareil ♂ et leurs orifices, que j'ai dû superposer, dans le même plan transversal ; il n'y a pas à proprement parler d'atrium commun, la partie où débouche la papille ♂ aboutit à l'orifice externe à côté de l'autre qui est uniquement ♀ ; elle referme une papille analogue à celle de *B. everetti* mais moins saillante, entourée d'un bourrelet à glandes rouges, tandis qu'elles sont surtout bleues dans le reste (pl. 13, fig. 6). L'ootype est légèrement dilaté à l'origine.

Il n'est pas contestable que ces deux espèces ne soient très étroitement apparentées, toutes ces similitudes anatomiques ne pouvant être fortuites, et l'on est obligé de conclure que la forme et l'ornementation ont dû varier indépendamment et diverger lors de leur récente séparation.

BIPALIUM POIENSE de Beauchamp. (Fig. 5 et 6.)

L'unique individu provient du Mt. Poi, 5350 p. Il mesure 14 mm. sur 4, 5, forme plutôt trapue, avec une tête courte et peu séparée de 3, 5 seulement. La teinte de fond est noire avec une large raie médiane jaune clair qui s'interrompt un peu plus bas que le milieu, puis se dilate pour entourer le point noir qui occupe l'extrémité inférieure. Sur la tête elle se dilate aussi en losange, continu avec deux taches latérales ; le ventre est gris, mais jaune sous la tête et au bord de la sole blanche. Le pigment ne laisse apercevoir les yeux qu'au bord ventral du front et dans les taches latérales où il ne sont pas très nombreux. La bouche est à 5 mm. de l'extrémité, le pore génital à 3 plus bas.

Il est assez probable que cette espèce est identique au *B. expeditionis* très sommairement décrit par Loman (1895, p. 32, fig. 2) de l'W. de Bornéo, qui présente aussi une raie jaune

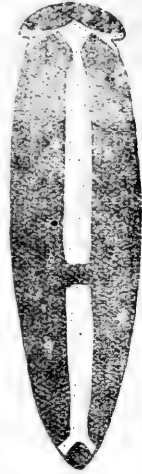


Fig. 5. *Bipalium poiense* vue dorsale de l'individu unique, x 1, 5.

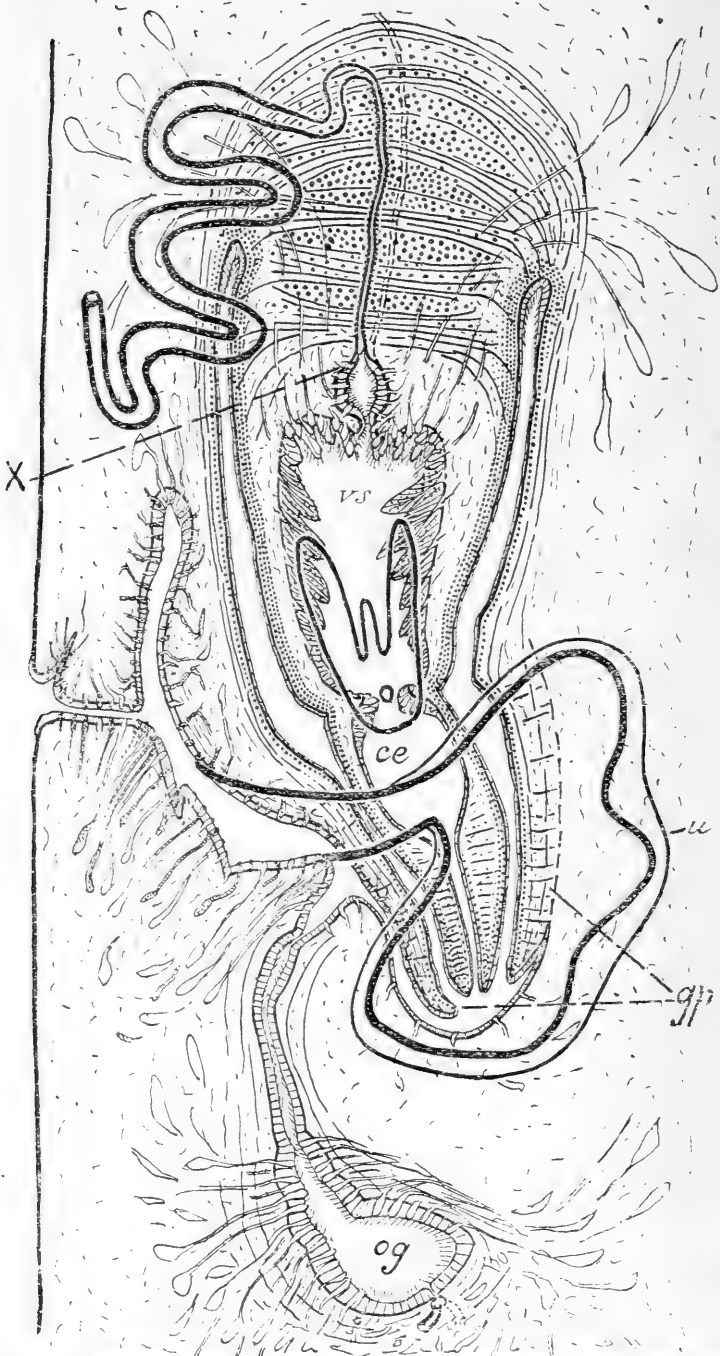


Fig. 6. *Bipalium poiense*, coupe sagittale schématique de l'appareil copulateur.

interrompue ; mais elle ne se prolonge pas jusqu'à la tête, dont l'ornementation paraît différente, et porte elle-même une ligne noire médiane ; il est prudent d'attendre l'étude anatomique d'un spécimen de ce type. Comparer aussi les *B. claviforme* du même auteur (Loman, 1890, p. 141, pl. xii, fig. 6 ; Graff, qui a d'ailleurs sans doute vu une autre espèce, p. 436, pl. x, fig. 10--15), *ocellatum* et *robiginosum* de Graff (p. 434 et 435, pl. x, fig. 1--7), tous de Buitenzorg, qui ont une certaine similitude d'ornement plutôt que de forme ; le dernier a un appareil copulateur assez différent comme nous le verrons.

L'appareil copulateur a quelques affinités avec les deux précédents, mais s'en écarte par la plus haute différenciation du pénis et la présence d'un "utérus." Tout l'ensemble est entouré d'une musculature commune longitudinale assez développée. Le bulbe, dont la longueur n'atteint pas la moitié de celle du pénis libre, est plus arrondi que dans les précédents, mais montre la même disposition alternée des fibres, ici cintrées en coupole ; les canaux déférents le traversent séparément sous forme capillaire. Au dessous, ils se réunissent dans une première petite vésicule renflée au sein du parenchyme et qui se jette dans une seconde beaucoup plus grande ; leur épithélium est papilleux surtout dans le bas, dans la première et le haut de l'autre il est traversé par l'aboutissement de glandes rouges extérieures au bulbe. A la moitié de sa longueur le pénis présente une constriction, de même que l'atrium qui l'entoure ; au-dessus il renferme autour de la vésicule de larges sacs tapissés d'un épithélium sécréteur rouge ; autant qu'on peut en juger sur la coupe longitudinale, il y en a de chaque côté deux avec un plus petit intercalaire (en trait fort dans la fig. 6, texte), se réunissant pour s'ouvrir ensemble dans le rétrécissement du canal : la coupe vers le milieu de la vésicule doit être analogue à celle que figure Ritter-Zahony (1905, p. 188, fig. 3) pour *Placocephalus bergendali*. A partir de là, le canal éjaculateur d'abord spacieux se rétrécit vers le bout ; son épithélium reste bas.

La musculature pénienne comprend surtout une couche circulaire externe, plus épaisse dans le haut, et une interne seulement dans le bout du canal éjaculateur ; la première au niveau des culs de sac se réfléchit autour de l'atrium qu'elle revêt en entier. Celui-ci est étroit et forme dans sa dernière partie autour du pénis une véritable gaine suspendue dorsale-

ment dans l'atrium commun; le tout est de plus dévié à droite, ce que la figure ne peut rendre; son épithélium est bas, sauf dans les culs de sac où il est cilié; on y trouve une abondante sécrétion rouge ayant sans doute reflué du pénis car les glandes manquent.

L'ototype est orienté longitudinalement, avec une extrémité renflée, ciliée, recevant les glandes coquillères et l'abouchement commun des oviductes. Il débouche dans l'atrium commun environ à mi-chemin de l'orifice externe et du fond dévié à droite qui renferme la gaine du pénis (ce fond a un épithélium plus bas et dépourvu des gl. bleues et rouges abondantes à l'entrée); au même niveau, l'atrium émet à gauche un caecum dilaté en une cavité spacieuse (en trait fort dans la fig. 6), tapissé d'un épithélium bas prenant fortement l'hématoxyline et entouré d'une musculature propre surtout circulaire; on doit certainement le regarder comme un "utérus," ou plutôt une bourse copulatrice comme en présentent quelques Terricoles, où elle est plus rare et moins individualisée que chez les Paludicoles.

Toutes les particularités ci-dessus placent cette espèce fort à part; un entrecroisement des fibres du bulbe, en dehors de celui qui existe dans le boudin plus allongé des précédents, n'a été décrit que chez une espèce de Madagascar, *B. woodworthi* Graff, d'après Mell, d'ailleurs fort différente par sa topographie générale comme tous les *Bipalium* Malagaches qui sont sans doute d'origine commune; mais c'est probablement une structure assez répandue. Le *B. robiginosum* Graff, espèce à raie longitudinale, a le pénis beaucoup plus petit, caractères que présente aussi le *B. bergendali* de Ritter-Zahony (pl. ii, fig. 11) que nous avons rapproché pour les culs de sac de la vésicule, ni l'un ni l'autre n'a d'utérus développé.

BIPALIUM PSEUDOPHALICUM de Beauchamp. (Fig. 7 et 8.)

Un seul individu du Mt. Poi, altitude non indiquée, mesurant 45 mm. sur 4, 5, la tête 5, 5 de large. Dos noir brun avec une bande transversale nucale jaune rougeâtre, une autre un peu au-dessous renflée au milieu, et deux petites taches latérales vers le tiers inférieur. La face ventrale est brun clair, la sole à peine moins foncée avec raie médiane noirâtre. La bouche se trouve à 20 mm., le pore où fait saillie la papille ♂ à

7 plus bas. Par son aspect extérieur cet individu paraîtrait appartenir au cycle de variation du *B. pennissenense*, dont nous discuterons plus loin les affinités, avec réduction des dernières bandes transversales et tête un peu moins échancrée en bas; pourtant l'appareil génital est très différent et beaucoup plus évolué.



Il est caractérisé par la réduction du pénis propre, et la grand développement au contraire du canal copulateur papilleux et dévaginable en une sorte de faux pénis, d'où le nom spécifique. Le bulbe musculaire est de forme ovoïde, ses fibres principalement longitudinales avec une couche circulaire en dedans; il s'étire en deux cornes pour recevoir les canaux déférents, pourvus également à ce niveau de fibres circulaires. Ceux-ci se renflent aussitôt dans le parenchyme central et s'y réunissent en un court canal commun, le tout tapissé d'un épithélium papilleux chargé de grains rouges. Il aboutit à une vésicule séminale lobée, à revêtement plus régulier mais recevant dans ses culs de sac les glandes extrinsèques traversant les muscles; elle débouche à la pointe, dilatée en tube rappelant un peu le flagellum de quelques Triclades, du cône très obtus, sans muscles, qui représente le pénis propre.

Fig. 7. *Bipalium pseudophallium*, vue dorsale de l'individu unique, x1, 5.

L'atrium ♂ est spacieux, avec un épithélium assez haut, cilié, entouré de fibres circulaires, puis longitudinales; il se rétrécit brusquement en un canal copulateur traversant la papille génitale ♂ très effilée et saillante au pore commun; sa paroi externe, invaginable et représentant l'extrémité du canal, est couverte de verrues obtuses et cuticularisées, tandis que la base est lisse. Sur toute la papille l'épithélium est peu visible, mal conservé ou "eingesenkt"; des muscles longitudinaux, et bien entendu la couche circulaire interne se réfléchit en dehors à l'extrémité.

L'atrium commun, peu étendu, a près de l'orifice un épithélium haut avec nombreuses glandes bleues, qui disparaît dans le fond. Là s'ouvre l'ootype, divisé par un étranglement en deux parties à peu près égales; la ventrale n'est peut-être qu'un atrium ♀ individualisé, elle a un épithélium bas



Fig. 8. *Bipalium pseudophallicum*, coupe sagittale schématique de l'appareil copulateur.

recevant des glandes bleues et des glandes rouges, celles-ci surtout dans le court canal plissé qui la sépare de l'atrium commun. La dorsale au contraire a le revêtement habituel très haut et basophile traversé par les glandes coquillières; elle forme en haut un cul de sac qui reçoit les deux oviductes.

Une seule espèce décrite offre des disposition analogues, c'est *B. (Placocephalus) fuscatum* Stimpson, espèce de plus grande taille que la nôtre et sans bandes transversales qui se trouve du Japon aux Indes en passant par les Natunas et Buitenzorg (la preuve anatomique d'identité n'a pas été faite pour toute ces stations. Le schéma de Graff (fig. 66, p. 220) correspond bien au nôtre, sauf que la papille ♂ paraît plus massive et plus musculaire (peut-être parceque partiellement invaginée), que le bulbe est plus court et entièrement rempli par la vésicule sans parenchyme ni partie dilatée des canaux déférents; il y aurait aussi un petit utérus que je n'ai pas rencontré. En tous cas les deux espèces sont très voisines.

BIPALIUM GRAFFI Jos. Müller. (Fig. 9 et pl. fig. 7.)

Cette espèce a été bien décrité (1902, p. 78, pl. iv, fig. 2, 2a, 2b) sur un exemplaire unique et incomplet appartenant au British Museum et provenant de Bornéo, district de Baram, près de Sarawak; en même temps J. Müller décrivait (p. 79, pl. iv, fig. 3, 3a, 3b) un *B. böhmigi* du Mt. Matang, Sarawak, 3,000 pieds, également unique, qui paraît n'en être qu'une variété. Mon individu, étiqueté "Bakong, Baram River," est de conservation parfaite. Il mesure 95 mm. sur une largeur de 7. La tête, mutilée dans celui de M. est plus large (12 mm.) et plus auriculée que dans aucune des espèces ici décrites tout à fait en faucille à bout rabattu (fig. 7, pl.). La teinte du dos est plutôt un gris très foncé légèrement brunâtre; les 3 paires de macules claires sont peu distinctes, sauf la première nettement en A (chez *B. böhmigi* elles se développent en 6 paires de taches rejoignant une raie médiane). La tête présente sur fond blanc d'ivoire la bande marginale et les 3 taches gris noir indiquées par M.; ces dernières un peu plus grandes.

La face ventrale est d'un gris beaucoup plus clair où tranchent en blanc jaunâtre la sole, une bande submarginale et deux taches sous la tête. Les yeux forment une bande serrée sur tout le bord de la tête, qui s'éparpille presque jusqu'au milieu.

Je donne de l'appareil copulateur un schéma comparable aux autres (fig. 9); celui de *M.* (pl. v, fig. 3) montre une distorsion

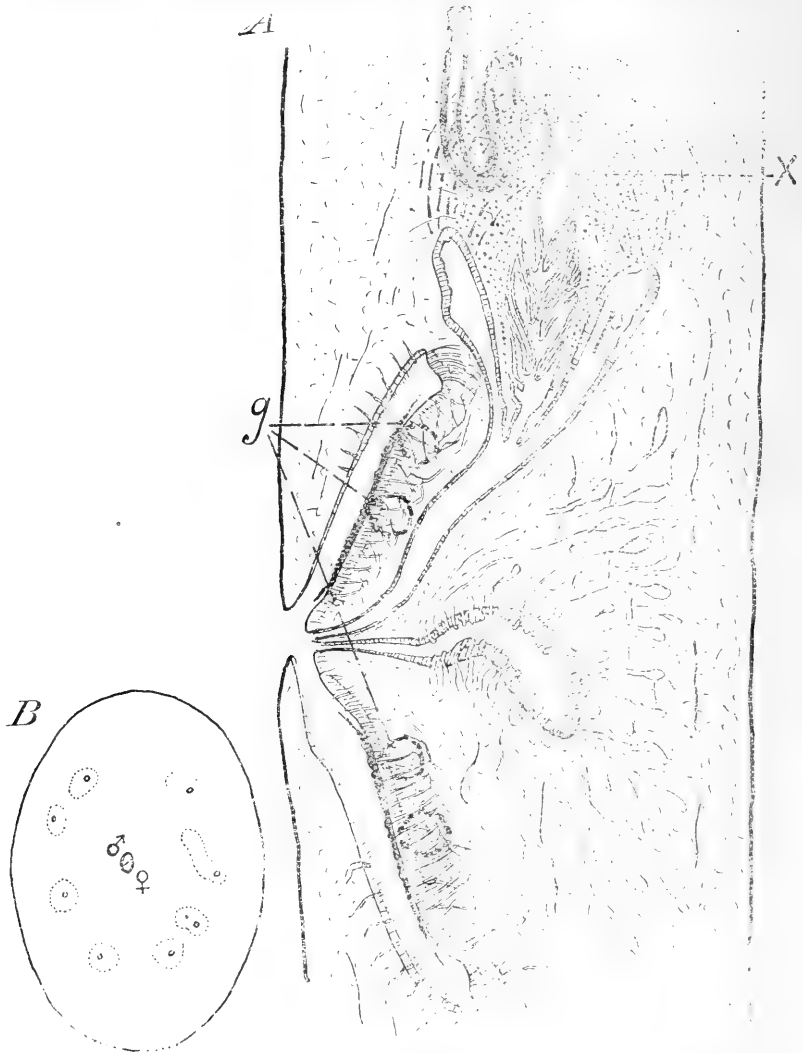


Fig. 9. *Bipalium graffi*: A, coupe sagittale schématique de l'appareil copulateur; B, tubercule génital et ses glandes vu de face.

du bulbe et un orifice faisant communiquer sa cavité avec celle de l'atrium qui sont certainement des lésions du spécimen.

Le pénis peu développé est creusé d'un canal éjaculateur dilaté en vésicule séminale, formé par la réunion des canaux déférents qui se gonflent progressivement après leur entrée dans le bulbe, garni de longues papilles convergentes à épithélium vacuolaire ; les fibres du bulbe sont surtout circulaires en dedans, en coupole par dessus. L'atrium s'amincit en un long canal copulateur qui vient déboucher au centre du tubercule génital elliptique formant le fond de l'atrium commun ; sa musculature est très faible, son épithélium haut seulement dans les culs de sac, avec des cils mal conservés. L'ootype débouche en dessous du précédent, et se porte perpendiculairement vers le dos, il est médiocrement dilaté et reçoit les oviductes par une portion commune très courte ; les glandes coquillières sont très développées.

Tout ceci est peu caractéristique, la principale particularité se trouve dans les glandes qui s'ouvrent à la surface du tubercule génital et que je n'interprète pas tout-à-fait comme M. Il en compte 11, j'en trouve 8 disposées grossièrement par paires (fig. 9 B. texte), il y a sans doute une variabilité individuelle. De plus il les considère comme de simples réservoirs recevant par des tractus à travers le parenchyme musculaire la sécrétion de corps glandulaires dont il ne peut préciser l'emplacement. Je suis convaincu que ceux-ci n'existent pas, et que les 8 masses rondes ou étirées en boudin sont bien formées par les cellules glandulaires elles-mêmes, allongées et vacuolaires mais groupées en acinus (ce qui est fort rare chez les Platodes), comme l'a fort bien figuré M. lui-même (pl. vi, fig. 1) ; malgré leur compression réciproque on y distingue de petits noyaux allongés, et le long de la lumière des bâtonnets rouges qui paraissent la sécrétion ; leur extrémité seule s'étire par places hors de l'acinus principal et forme les petits nodules accessoires également vus par M. Comme il le dit l'orifice de sortie est difficile à voir et peut-être temporaire ; on le reconnaît à un petit amas de sécrétion granuleuse qui décolle le plateau couvrant tout le tubercule ; ce plateau n'est autre chose qu'une sécrétion rouge coagulée, épanchée par des glandes nombreuses, perpendiculaires à la surface et très allongées, que M. paraît avoir prises pour des fibres musculaires, ce qui n'étonnera guère ceux qui ont quelque habitude de l'histologie si particulière des Platodes. Quant à l'épithélium du tubercule, il est "eingesenkt" et ses noyaux doivent être cherchés en-dessous de la couche conjonctive superficielle très dense bien vue par M.

Le *B. böhmigi* a une disposition tout-à-fait comparable (M. fig. 1, p. 88); la forme différente du tubercule avec glandes plus serrées peut tenir à l'état de contraction ou de maturité; la seule différence bien nette pour M. est qu'il recevrait dans

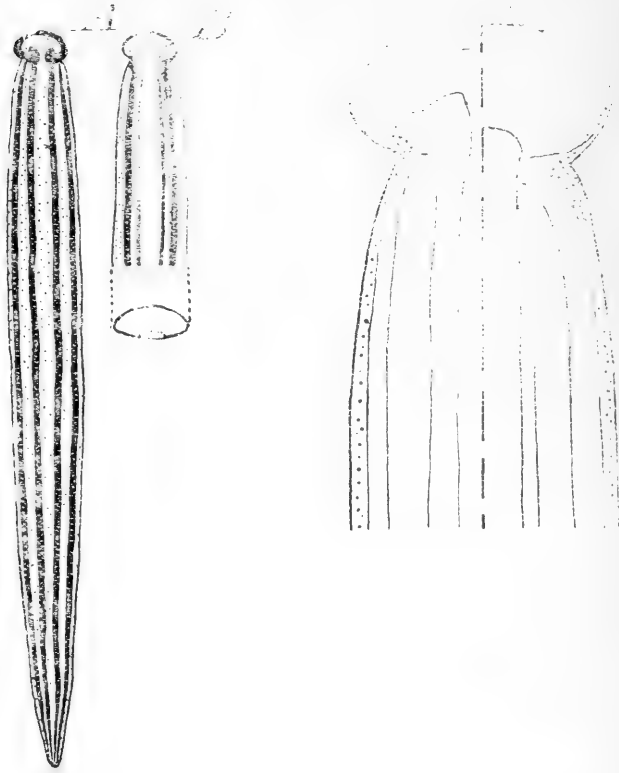


Fig. 10. *Bipalium mjobergi*: A, face dorsale d'un animal entier, x2; B, face ventrale de la région céphalique; D, schéma de la répartition des yeux, à gauche, face dorsale, à droite, face ventrale.

le canal éjaculateur des glandes érythrophiles extrinsèques, dont le corps n'a d'ailleurs pu être découvert, tandis que *graffi* n'aurait dans le bulbe que des tractus radiaires conjonctifs; j'en ai vu quelques-uns aussi, et de rares grains de sécrétion présents dans la lumière qui m'ont paru provenir de l'épithélium. Bref je ne doute guère que ces deux formes n'appartiennent au cycle de variation d'une même espèce.

BIPALIUM MJÖBERGI de Beauchamp. (Fig. 10 et 11.)

Cette espèce, dont j'ai reçu 4 individus du Mt. Poi, paraît mieux caractérisée par son ornementation que par son appareil copulateur assez banal. La forme est élancée, le plus grand pris à 5,200 pieds d'altitude mesure 54 mm. sur 4. La tête (fig. 10, ci-contre, *A* et *B*) est petite et peu détachée du corps, la teinte de fond jaune ocre uniforme, avec 4 raies noires longitudinales sur le dos, autant sur le ventre. Les dorsales sont équidistantes, les sub-médianes se renflent à la base de la tête et reçoivent là les sublérales en même temps que la bande marginale de celle-ci. Sur le ventre les deux du même côté sont très rapprochées entr'elles et les deux groupes limitent la sole qui n'est aucunement saillante (*c*) et ne se distingue qu'à sa teinte blanchâtre; les sublérales se jettent dans le collier incomplet formé par les dorsales, les submédianes s'amincissent et s'arrêtent un peu avant. La face inférieure de la tête est de la couleur de la sole. Bouche à 25 mm. de bord frontal, pore génital à 7 plus bas.

Les 3 individus pris à 5,450 pieds n'en diffèrent que par leurs raies un peu moins larges. Ils ont respectivement 50 mm. environ sur 5 (celui-ci a servi à l'établissement d'une série de coupes); --40 sur 4; --25 sur 3.5, mais sans extrémité céphalique, et dépourvu de pore génital. La disposition des yeux est indiquée sur le schéma ci-contre (10, *D*); ils se prolongent sur les côtés du corps. Aucune espèce connue n'offre un aspect analogue, les raies longitudinales quand elles existent étant irrégulières; on les trouve d'ailleurs surtout chez des formes de Madagascar.

L'appareil copulateur (fig. 11 texte) comprend un pénis conique à bulbe arrondi, saillant dans un atrium ♂ qui aboutit par un long canal copulateur sur un tubercule génital petit, à côté de l'ootype renflé en poire. La vésicule séminale très papilleuse s'étire en un prolongement (en partie double, un accident à la série de coupes ne me permet pas de préciser exactement le point de réunion) qui reçoit à l'entrée dans le bulbe chaque canal déferent, très sinueux et pourvu d'une musculature puissante. L'épithélium de l'atrium est bas sauf comme toujours dans les culs de sac et dans le canal copulateur où la ciliation est nette; il est entouré d'une musculature circulaire développée surtout autour de celui-ci; quelques fibres longitudinales, pas d'enveloppe commune. L'ootype a aussi

des muscles circulaires surtout autour du col, les glandes coquillières sont peu développées. D'ailleurs, bien que les canaux déférents fussent remplis de sperme, ce col et la pointe



Fig. 11. *Bipalium mjobergi*, coupe sagittale schématique de l'appareil copulateur.

du pénis n'étaient pas encore complètement perforés. Le centre du tubercule génital a comme il est fréquent un épithélium "eingesenkt" avec des glandes rouges, tandis que sur le reste de l'atrium il est cubique, avec glandes surtout bleues.

Cet appareil copulateur représente un type peu évolué, gardant le plan général des formes jeunes (voir fig. 1 texte) et très commun dans les *Bipalium* : c'est plus ou moins celui de *B. (Placocephalus) kewense* et *B. (Perocephalus) hilgendorfi* d'après Graff, *B. strubelli* d'après J. Müller, &., sans parler des formes de Madagascar décrites par Geba et Mell. dont la topographie est un peu différente et de quelques autres qui ont des différenciations supplémentaires comme les glandes du précédent. On appréciera suffisamment les différences d'après les figures; la faiblesse de la musculature commune et l'étirement de la vésicule séminale au devant des canaux déférents paraissent les caractères les plus particuliers. L'extérieur n'a d'ailleurs aucun rapport.

BIPALIUM PENRISSENENSE de Beauchamp. (Fig. 12 et 13.)

Cette espèce, représentée par 5 échantillons, 4 du Mt. Penrissen et 1 du Mt. Poi, est très variable extérieurement; pourtant l'anatomie a été trouvée identique à quelques détails près dans les 3 où elle a été étudiée. L'individu du Poi, le plus grand (fig. 12, B), mesure 27 mm. sur 5, la tête, grande et largement échancrée, 6 de large. Le dos est noir, sur la tête une bande submarginale jaune infléchie au milieu, sur le cou une bande transversale un peu en zigzag, ensuite 4 autres interrompues au milieu (la dernière presque pas), l'extrême bout jaune aussi. Le ventre est gris avec prolongation des bandes jusqu'à la sole noire, la face ventrale de la tête *jaune* avec bordure et trait médian noirs. La bouche est à 15 mm., après la troisième bande, le pore génital peu visible à 4 d'elle. Les yeux, très nombreux sur les oreillettes, forment une ceinture au bord de la tête qui s'épaissit au milieu, et sur ceux du corps, en plusieurs rangs, où on les aperçoit au niveau des bandes et même au bout inférieur. A été coupé.

Le plus grand individu du Penrissen, 4,000 pied, a 20 mm. sur 3.5, ornementation similaire mais fond un peu plus clair, bandes un peu plus rougeâtres et à bords droits, y compris la submarginale sans inflexion. Pas de tache au bout inférieur, bouche à 8, pas de pore apparent, j'ai donc jugé inutile de le couper. Un second de même provenance (fig. 12, A), brisé, a 8 sur 2.5, tête 4, une bande submarginale mince, une nucale interrompue ainsi que les 3 (seulement) autres transversales; entr'elles des taches irrégulières se prolongeant aussi à la face

ventrale, et dans le bas une raie médiane interrompue et l'ébauche de deux latérales. A été coupé et trouvé sexué. Un troisième (fig. 13, E), de 19 sur 3, tête 4, a la bande sub-

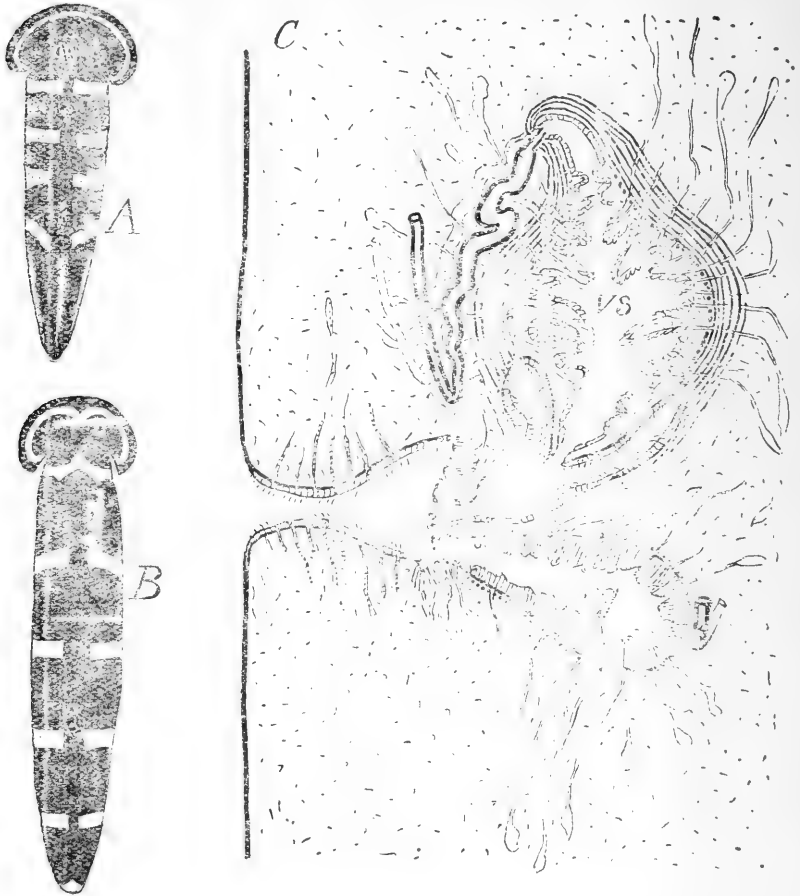


Fig. 12. *Bipalium penrissenense*: A, un individu du Mt. Penrissen, x5; B, individu du Mt. Poi, x2; C, coupe sagittale schématique de l'appareil copulateur dans l'individu A.

marginale remplacée par deux larges taches se touchant presque au milieu, pas de nucale, 3 transversales seulement, continues et un peu irrégulières (elles paraissent blanches par destruction de l'épiderme). Bouche à 11, pas de pore génital.

Enfin le dernier individu du Penrissen, pris à 3,000 pieds (fig. 13, *D*; 13 mm. sur 2.5, tête 3.5), seulement, a également deux taches sur la tête, mais plus petites, 4 bandes dont la première.

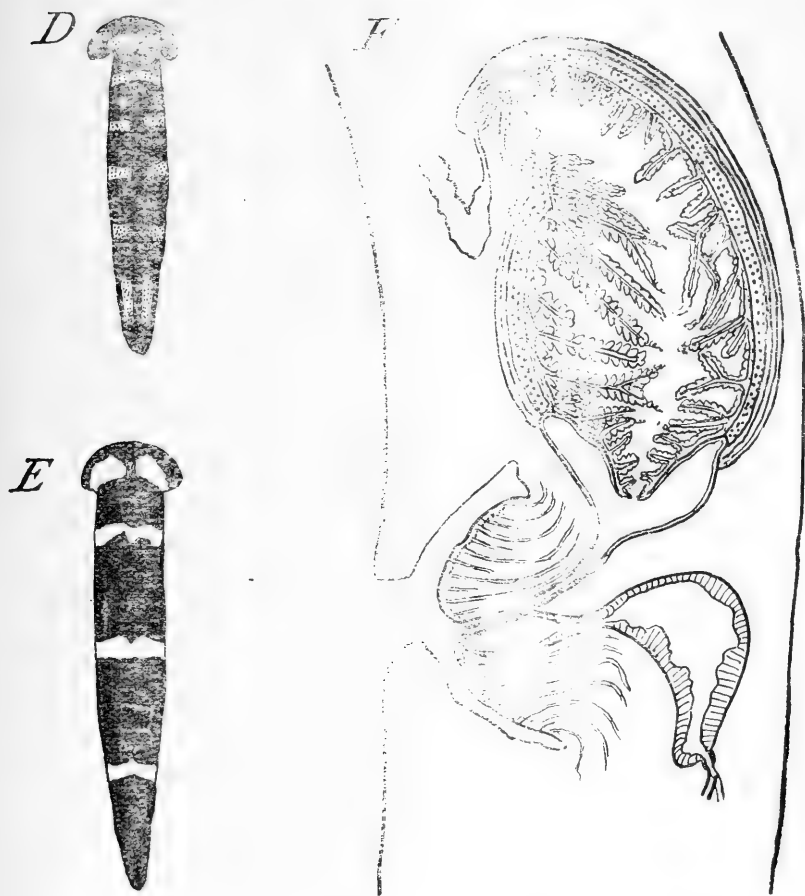


Fig. 13. *Bipalium penrissenense*: *D* et *E*, deux individus du Mt. Penrissen, $\times 2$; *F*, coupe sagittale schématique de l'appareil copulateur de l'individu *D*.

seule continue, est un peu trop bas pour être qualifiée de nucale, et 2 raies longitudinales près de l'extrémité qui à elle même une tache, également jaune orangé. La bouche est à 6 mm. (3^o bande) le pore à 3 au delà (4^o). A été coupé.

Ces descriptions rappellent surtout les *B. kuhli*, *sexcinctum* et *quadricinctum* Loman (voir Graff, pl. ix, fig. 38, 39, 40), tous 3 de Sumatra et connus par un seul exemplaire; mais aucun n'a de bande proprement nucale, et la raie médiane, ébauchée seulement dans l'un des nôtres, est partout nette. La seconde espèce figurée par Houghton, *B. houghtoni* Moseley, appartient peut-être à ce type, mais la figure (que le texte déclare d'ailleurs peu exacte) est trop vague pour qu'on puisse l'affirmer. Un matériel considérable et de provenance variée sera nécessaire pour définir les limites de cette espèce polymorphe, d'autant que l'appareil génital est peu caractéristique et qu'il est difficile de dire jusqu'à quel point ses petites variations sont individuelles.

Le schéma que j'ai donné dans ma note préliminaire, et qui est reproduit ci-contre (fig. 12, C), a été élaboré surtout avec les coupes du second individu du Penrissen, figuré à côté (12, A); il montre une topographie tout à fait comparable à celle de l'espèce précédente et des autres citées à son propos. La vésicule grande et très papilleuse où viennent s'ouvrir de nombreuses glandes rouges extrinsèques, le prolongement recourbé vers le ventre et revêtu par la musculature, qu'elle forme pour recevoir les canaux déférents, la décomposition de celle-ci en couche longitudinale externe et circulaire interne en sont les traits les plus saillants. Mais dans l'individu du Poi (12, B) il y a déjà de légères différences: la partie libre du pénis plus développée (plus longue que le reste du bulbe), l'atrium ♂ étant plus profond, moins de papilles dans cette partie libre, les muscles circulaires en plusieurs couches surtout dans le haut, l'ootype plus renflé. D'autre part j'ai coupé ultérieurement le dernier individu de Penrissen (fig. 13, D) et constaté (13, F, les détails secondaires ne sont pas figurés) un pénis proportionnellement très petit, des papilles longues et ramifiées, un ootype recourbé vers le bas où se trouve reporté l'abouchement des oviductes, et surtout un tubercule génital renflé tandis qu'il est à peine saillant dans les 2 autres (la structure est d'ailleurs identique, épithélium "eingesenkt" et nombreuses glandes rouges filiformes, orifice ♀ nettement à gauche de l'orifice ♂). Je considère toutes ces différentes comme contingentes, liées peut-être même au degré de maturité, mais il sera comme je l'ai dit utile d'approfondir la question.

GENRE PELMATOPLANA von Graff.

Le genre *Pelmatoplana* a une répartition analogue à celle de *Bipalium*, mais un peu plus étendue : tandis qu'à l'E. il s'avance jusqu'aux Loyalty (Schröder), à l'W. il saute de Madagascar à l'Afrique occidentale où une seule espèce est décrite de la côte des Esclaves. Ce fait est remarquable, bien qu'il en existe d'autres exemples ; on peut il est vrai se demander jusqu'à quel point le genre est naturel ; il ne diffère du circumtropical *Geoplana* que par la forme plus effilée, crêtes glandulaires absentes et sole étroite, caractères qui ont bien pu apparaître indépendamment. L'espèce Africaine n'est point connue anatomiquement.

PELMATOPLANA GLANDULOSA de Beauchamp. (Fig. 14, et pl. fig. 8 et 9.)

Deux individus, le mieux conserve (qui a été coupé) de Lundu, long. 43 mm., larg. maximum 4, vers le tiers supérieur, s'effilant inférieurement. Dos gris noir, un peu plus foncé de part et d'autre d'une raie médiane jaune clair qui se perd sur la tête ; (pl., fig. 8) bords jaunes également se confondant avec la face ventrale, sole étroite et non saillante. Bouche à 21 mm. de la pointe supérieure, pore génital à 8 plus bas. Les yeux forment sur le bord de la tête plusieurs rangées qui se prolongent en s'amincissant jusque vers le milieu du corps, avec une densité maximum sur le léger étranglement supérieur, où ils débordent à la face ventrale. Ils paraissent plus nombreux que dans aucune espèce décrite. Le second individu, du Mt. Penrissen, 4,500 pieds, déformé dans sa partie inférieure, mesure environ 50 mm. sur 3, même ornementation (le jaune un peu plus foncé), bouche à 24.

Ces marques ne diffèrent guère de celles de certaines espèces connues, *P. humberti* Graff (p. 392, pl. iii, fig. 32) de Ceylon (mais les yeux y sont peu nombreux), *P. bogoriensis* Graff (p. 392, pl. iv, fig. 36--37) de Büitenzorg (mais la largeur est maximum à l'extrémité inférieure) ; l'anatomie n'est d'ailleurs connue dans aucune des deux.

L'appareil copulateur de la nôtre est formé comme dans toutes les *Pelmatoplana* (fig. 14 ci-contre) d'une partie ♂ et d'une partie ♀ orientées en sens inverse et à peu près de même

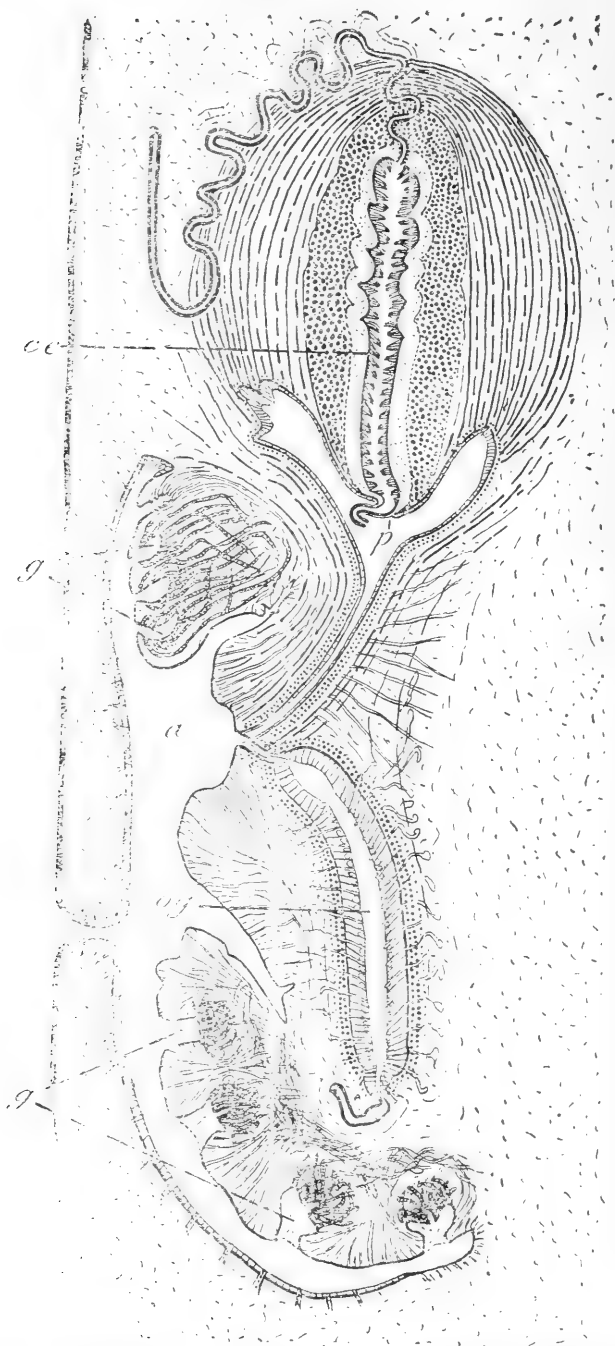


Fig. 14. *Pelmatoplana glandulosa*, coupe sagittale schématique de l'appareil copulateur.

longueur, à partir de leurs orifices contigus au fond de l'atrium commun; sa meilleure caractéristique est fournie par les groupes de glandes qui s'ouvrent en haut et en bas de celui-ci. Le bulbe pénien est volumineux, ovoïde, formée en dehors de fibres longitudinales cintrées avec quelques tractus radiaires (glandulaires?), en dedans d'une couche circulaire épaisse séparée par un peu de parenchyme du canal éjaculateur onduleux, à épithélium dissocié en papilles basophiles. Il reçoit les deux canaux déférents à travers la musculature par une portion impaire très mince et s'ouvre à l'extrémité d'un cône pénien très surbaissé par un petit tube flagellaire. L'atrium ♂ se rétrécit aussitôt en un long canal copulateur entouré de fibres circulaires (quelques fibres longitudinales et quelques glandes rouges éparses autour), et tapissé d'un épithélium plat. L'ootype, à peu près symétrique du canal copulateur par rapport au plan transversal des orifices, est un long canal à épithélium cylindrique traversé par les glandes coquillières, avec un manchon de muscles circulaires bien développé et quelques fibres longitudinales; au fond souvrent indépendamment les deux oviductes.

Le tubercule génital où s'ouvrent les deux conduits dans une petite dépression (le ♀ un peu à gauche) a comme d'habitude un épithélium "eingesenkt" où débouchent de nombreuses glandes rouges. Au-dessus et au dessous la coupe médiane montre deux coussinets de même structure creusés de cryptes glandulaires (fig. 14, *g*). Sur l'inférieur ou ♀ le plus grand, on compte 4 dépressions dont chacune (pl., fig. 9) se termine par un récessus plus étroit où s'ouvrent à la fois des glandes rouges très serrées, dont les corps s'enchevêtrent au-dessous en plexus, et des glandes bleues à portion terminale granuleuse, entrelacées aux autres; dans les mailles du plexus se trouvent des cellules arrondies à gros noyau, sans doute conjonctives. Sur le coussinet supérieur ou ♂, disposition analogue avec 3 dépressions plus étroites et glandes bleues dans toute leur étendue; mais au-dessus et au-dessous, et de part et d'autre de cette rangée médiane, d'autres culs de sac moins individualisées reçoivent seulement des glandes rouges. Dans les parties latérales de l'atrium les coussinets inférieur et supérieur arrivent à se fusionner; le repli annulaire plissé ainsi constitué renferme encore des cryptes glandulaires au moins dans sa moitié supérieure, 2 rangées de 4 de chaque côté semble-t'il.

Parmi les *Pelmatoplana* anatomiquement connues, c'est avec *P. moluccana* Graff (fig. 47, p. 196) que la nôtre a le plus d'affinité, car les autres Indo-Malaises (*trincui* et *sarasinoroni*) figurées par Graff ont bien un long conduit ♀ analogue au nôtre, mais qui est en réalité un utérus en cul de sac près de l'entrée duquel débouchent les oviductes, et les deux de Madagascar décrites par Mell ont un ootype court et oblique qui donne naissance au fond à un canal génito-intestinal¹ en même temps qu'un long pénis saillant directement dans l'atrium commun. Elle diffère d'autre part de *moluccana* par la différenciation d'un canal copulateur et d'un tubercule génital analogue à celui des *Bipalium* et jusqu'alors inconnu dans le genre, en même temps que par celle des coussinets et des cryptes glandulaires.

Je donne pour terminer la liste d'ensemble des espèces décrites ici; on remarquera que si l'on acceptait les identifications que j'indique comme douteuses, le matériel du Dr. Mjöberg renfermerait toutes les espèces déjà connues à Bornéo, plus 4 nouvelles, et dans le cas contraire, 6 nouvelles (marquées d'un astérisque); par contre aucune n'est connue sûrement d'un autre pays; j'ai déjà indiqué la valeur toute relative de ces constatations.

Bipalium moseleyi Loman

Bipalium everetti Moseley

**Bipalium choristosperma* de Beauchamp

**Bipalium poiense* de Beauchamp = ? *B. expeditionis*
Loman

**Bipalium pseudophallicum* de Beauchamp

Bipalium graffi J. Müller = ? *B. böhmigi* J. Müller

**Bipalium mjobergi* de Beauchamp

**Bipalium penrissenense* de Beauchamp = ? *B. hough-*
toni Moseley

**Pelmatoplana glandulosa* de Beauchamp

¹ Je n'ai rencontré dans aucune de mes espèces cet organe, auquel Steinböck (1924) accorde une grande fréquence et une grande importance phylogénique chez les Turbellariés.

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Explication de la planche 13.

Lettres communes à toutes les figures, texte et planches.

a, atrium commun.

a ♂, *a* ♀, atrioms mâle et femelle.

cd, canaux déférents.

ce, canal éjaculateur.

cg, épithélium glandulaire

g, glandes de l'atrium commun.

ge, glandes du canal éjaculateur.

go, glandes coquillières.

gp, gaine du pénis.

od, oviductes pair.

og, ootype.

p, pénis.

pp, papille génitale ♂.

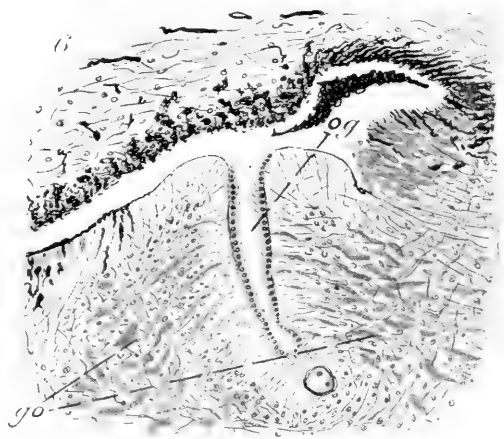
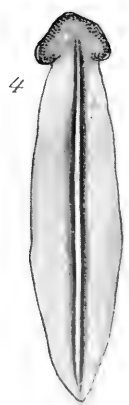
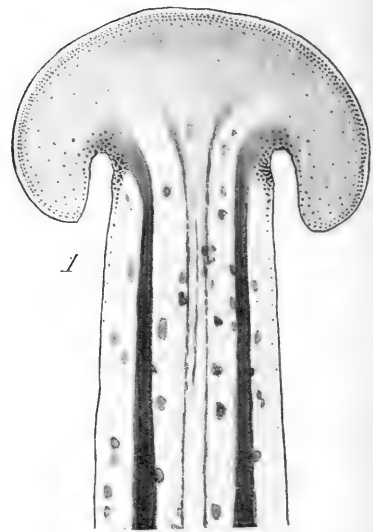
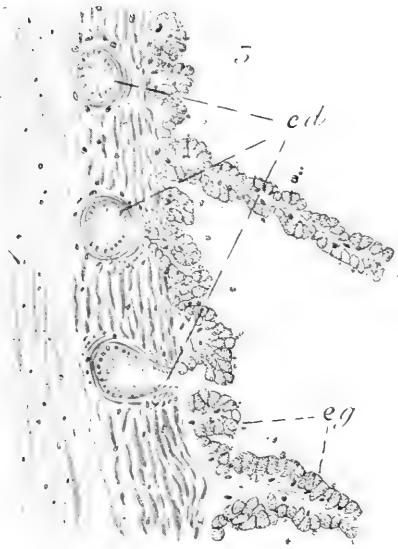
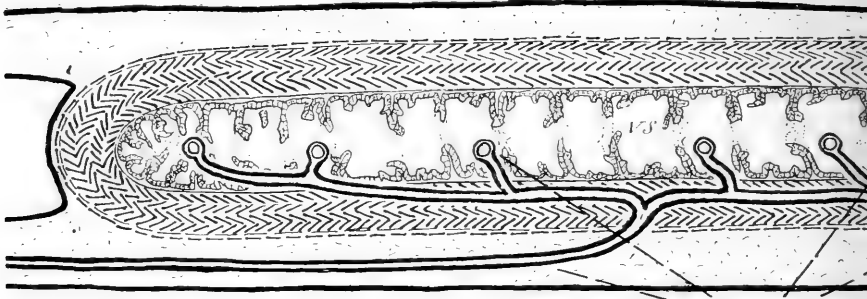
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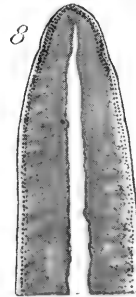
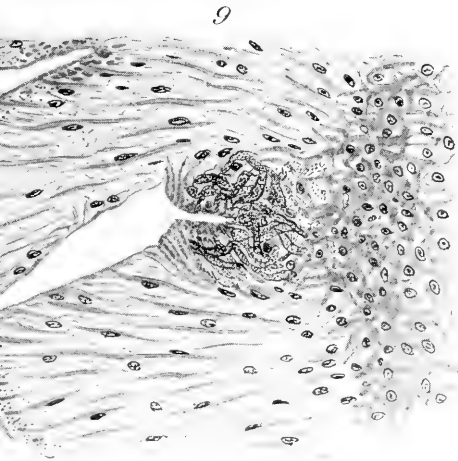
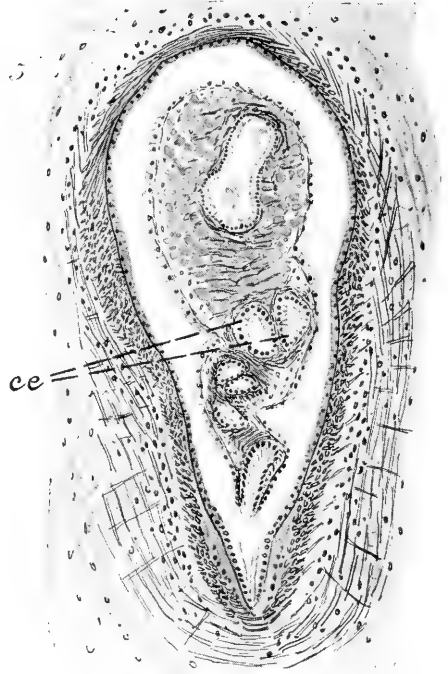
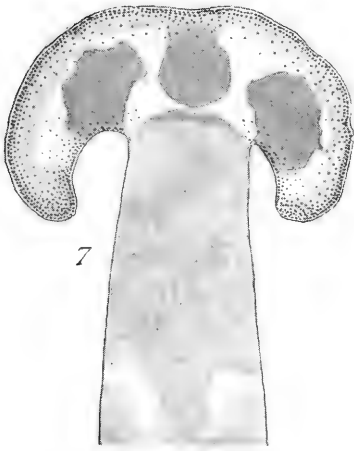
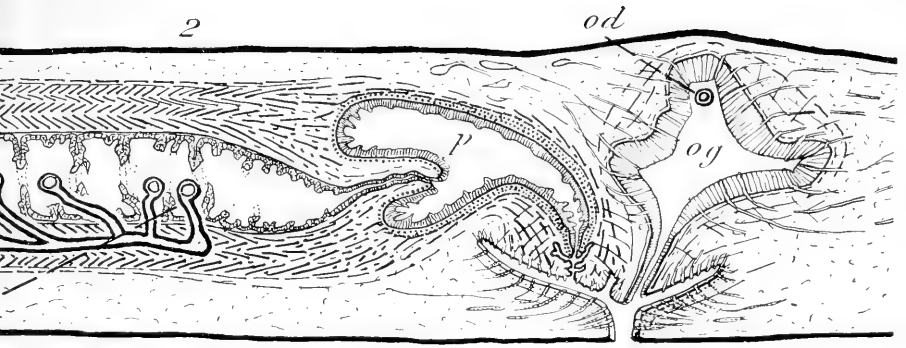
vs, vésicule séminale.

x, point de réunion des voies ♂ paires.

- Fig. 1. *Bipalium moseleyi* Loman. Extrémité céphalique, vue dorsale, x4.
- „ 2.—id.—Coupe sagittale schématique de l'appareil copulateur.
- „ 3.—id.—Portion de la vésicule séminale avec l'abouchement de trois branches d'un canal déférent.
- „ 4.—*Bipalium choristosperma* de Beauchamp, l'individu unique, face dorsale, xl,5.
- „ 5.—id.—Coupe longitudinale, intéressant l'atrium ♂, le début du canal copulateur, le pénis avec les doubles canaux éjaculateurs coupés à plusieurs niveaux.
- „ 6.—id.—Abouchement de l'ootype dans l'atrium ♀.
- „ 7.—*Bipalium graffi* J. Müller, extrémité céphalique, vue dorsale, x3, 5.
- „ 8.—*Pelmatoplana glandulosa* de Beauchamp, extrémité céphalique, vue dorsale, x4.
- „ 9.—6 id.—Une des cryptes glandulaires inférieures de l'atrium commun.









XX.—Some Lycid Beetles from Mt. Poi and Mt. Penrissen in Sarawak. By R. KLEINE.

CALOCHROMUS ORBATUS C. O. Waterh.

Cistula Ent. ii, 1872, p. 197.

Mt. Poi, 5000 feet.

CALOCHROMUS AEMULUS C. O. Waterh.

Cistula Ent. ii, 1877, p. 198.

A very dark specimen from Mt. Poi, 4000 feet, I refer without hesitation to this species.

PLATEROS EXPRESSUS n. sp.

Dark brown, only the margin of elytra and sometimes prothorax yellowish, moderately shining; elytra with dense and long hairs. Frons in ♂ as broad as the diameter of the eye; in ♀ broader, slightly impressed, hairy; antennae in ♂ dentate, in ♀ more slender, simple. Prothorax in ♂ a little broader than long, anterior margin rounded, protruding, anterior angles indistinct, the sides and posterior margin more or less straight, posterior angles rectangular, the basal impression short, only the margins punctured; in ♀ more rectangular. Scutellum at the extreme tip slightly sinuate. Elytra with distinct ribs and square reticulation.

Length of body, 5 mm. Width (humerus) 1.5 mm. Mt. Poi, 1500--2000 feet.

Typus in Sarawak Museum and cotypus in my collections.

The new species is easily separated from already described ones by its coloration. The lighter coloured parts of elytra stand out immediately from the darker parts, only at the lateral margin the dark colour approaches the basis. The shape of penis (fig. 2) distinguishes it directly from other species.

Sar. Mus. Journ., No. 10, 1926.



Fig. 1. Middle joint of antennae of *Plateros expressus* n. sp.

Fig. 2. Penis.

CONDERIS FAUSTERI Bourg.

Ann. Soc. Ent. Franc. lxxi, 1902--03.

A single specimen with deep blackish prothorax and scutellum, I must refer to this species. Bourgeois draws in his description attention to the fact that colour varieties of the above-mentioned kind occur. In all other characters it agrees well with Bourgeois' species.

Mt. Poi, 4350 feet.

DILOPHOTES PULCHELLUS n. sp.

♀. Black, only elytra with the exception of a small apical part cinnabar red, moderately shining. Prothorax and elytra dull; frons as broad as twice the diameter of the eyes, roughly and longitudinally sculptured, with scattered hairs; antennae strong, 3rd--11th joints of about the same length, $1\frac{1}{2}$ times as long as broad, undentate, of the shape of those of *D. commendatus* Kleine; prothorax at the hindangles as broad as deep, sides straight backwards dilated, posterior margin buckled in towards the middle, posterior angles only slightly protruding outwards; sculpture at the anterior margin dense and strong, the keel sharp, the narrow longitudinal furrow, falling in front of the posterior margin, is dissolved into isolated single punctures; elytra with three ribs, the 1st faint, in its posterior half vanishing, 2nd strong and nearly reaching the apex, 3rd distinct only at the base; puncture and hairs normal.

Length of body, 7 mm. Width (humerus) 1.5 mm. Mt. Penrissen, 4000 feet.

Typus in Sarawak Museum.

Easily distinguished from all other species by its brick-coloured elytra.

SCARELUS ARDENS n. sp.

Uniformly cherry-reddish, strongly shining, densely hairy. Head with shallow lateral impression; eyes small black. Antennae of about twice the length of the body, 1st joint club-shaped, 2nd very small with a dorsal tubercule or spine, 3rd--11th nearly of the same length, filiform, the basal joints rounded, cylindrical, the other ones towards the tips laterally compressed; prothorax broader than deep, anterior margin rounded, sides slightly dilated backwards, posterior margin on both sides of the middle bent forwards, areola very small, touching the anterior and posterior margin; 1st rib of elytra

indistinct, 2nd and 3rd strongly developed, reticulation of the broad furrows square-rectangular, in the furrows scattered long hairs.

Length of body 4.6 mm. Width (humerus) 1.75--2.0 mm.

Mt. Penrissen, 4000 feet. Also taken by Mr. G. E. Bryant at Mt. Matang, 2000 feet.

Typus in Sarawak Museum and British Museum, cotypus in my collections.

Easily distinguished from the few described species by its typical coloration.

XXI.—Protaphes, a new Lycid-genus from Sarawak. By R. KLEINE (Stettin).

(Sixth contribution towards the knowledge of the Lycidae).

Rostrum absent, frons impressed; eyes big, prominent. Antennae long, in ♂ reaching to the posterior third of elytra, in ♀ only to their middle, joints 3-11 many times longer than broad, only slightly dentate, laterally compressed, in ♂ strongly hairy. Prothorax square, at the anterior margin slightly rounded, sides and posterior margin nearly straight, posterior angles sharp, with five distinct sharply defined areolae, the middle areola large and broad, open at the anterior margin, broadly rounded at the posterior margin. Elytra with four slightly elevated primary ribs, secondary ribs at the base similar to the primary ones, but otherwise faint and narrow; the reticulation distinct, generally square. Abdomen and legs in both sexes normal.

Typus: PROTAPHES CONFERTUS n. sp.

The new genus comes in the vicinity of *Taphes pyropterus*, etc., not only in the shape of the prothorax but also in the genital apparatus, which is fairly similar to the one of the genus *Taphes*. It differs from *Pyropterus* by the long and elongate 3rd joint of antennae. The antennae form generally a good separating character; in *Taphes* the joints are short in *Protaphes* very long. The relationship with *Taphes* is further more evidenced by the fact that in ♂ the joints are provided with scattered long hairs, which in ♀ are absent. The rib formation of the elytra forms another separating character. Whereas *Taphes* and *Pyropterus* have strongly elevated primary ribs, the primary and secondary ribs in *Protaphes* are equally raised at the base, and are otherwise fairly similar. The entirely different shape of prothorax forms a character of importance.

PROTAPHES CONFERTUS n. sp. (Fig. 1, 2 & 3.)

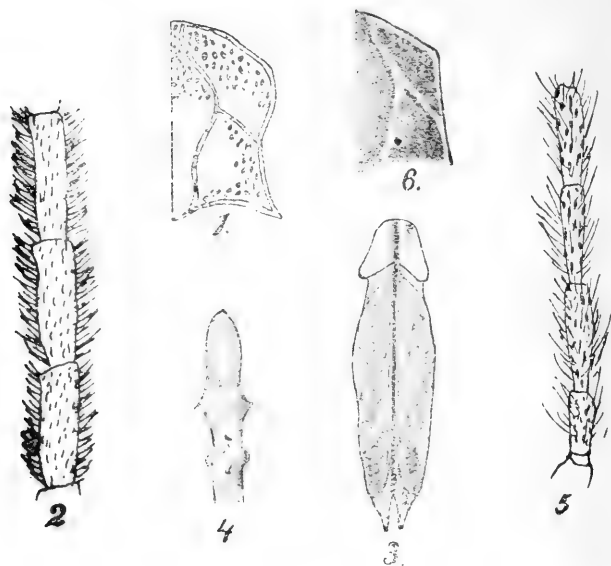
Yellowish, abdomen, legs and antennae more or less brownish, the whole body dull shining. The lateral areolae of prothorax very deep, the middle one shallow, the puncture at the anterior and lateral margin strong and deep. Elytra shortly and densely hairy.

Length of body in ♂, ♀ 5.5--8.5 mm.

Width (humerus) in ♂, ♀ 1.5--2.0 mm.

Distribution: Philippines (Surigao, Mindanao. Butuan, Iligan) coll. Fuller Baker.

Types in my collections (3 ♂, 3 ♀). Shows very little variation except in size.

*Prothaphes.*

1. Prothorax of *Protaphes confertus* n. sp.
2. Basal joints of Antennae of *P. confertus* n. sp.
3. Outlines of body of Penis of *P. confertus* n. sp.
4. Penis of *P. confirmatus* n. sp.
5. Basal joints of Antennae of *P. confirmatus* n. sp.
6. Prothorax of Antennae of *P. confirmatus* n. sp.

PROTAPHES CONFIRMATUS n. sp. (Fig. 4, 5 & 6.)

♂: Colour markings as in *P. confertus*, but the posterior margins of elytra more or less brownish-black. Antennae more slender than in *confertus*, from the 4th counted at least four times as long as broad, roughly sculptured, strongly hairy. Prothorax with the hind angles strongly produced. Otherwise very like *confertus*.

Penis (fig. 4) entirely differently shaped.

Length of body 7.0 mm. Width (humerus) about 1.5 mm.

Distribution: Sumatra, Bukit Gabah on the S. W. Coast, Benkoclen plateau 2000--3000 feet in jungle, 1918.

2 ♂ (now in my collections) collected by H. Lucht.

In spite of the great similarity of the species, easily recognized by the coloration of elytra. A close inspection of the genital apparatus is necessary.

PROTAPHES ARROGANS n. sp.

Smoky-brown in varying shades. Elytra in the posterior half and abdomen darkest, prothorax and antennae brownish, elytra in their basal parts rusty reddish; everywhere densely and depressedly hairy, velvet-like antennae long, reaching beyond the middle of the elytra, undentate, 1st joint club-shaped, 2nd very small, 3rd at least of the length of the 1st, but distinctly shorter than the 4th the following joints at least twice as long as broad about equal in length, with scattered long hairs.

Length of body 5 mm. Width (humerus) about 1 mm.

Distribution: S. E. Borneo, Martapura.

Coll. Doherty.

Typus in Brit. Museum.

Key to the Species.

- Elytra unicoloured, yellowish.....*P. confertus* n. sp.
 Elytra with dark brown or black posterior margin.
 Main colour of elytra yellowish, posterior angles of prothorax strongly produced.....*P. confirmatus* n. sp.
 Main colour of elytra smoky-brown, posterior angles of prothorax nearly square.....*P. arrogans* n. sp.



XXII.—On the First Malaysian Ptiliid (Staphylinioidea). By Dr. KARNY, Buitenzorg, Java.

As no Ptiliidae have been previously recorded from the whole Malaysian region, it seems to be of some interest to describe here the only specimen collected by Dr. E. Mjöberg. I name it :—

PTENIDIUM MJÖBERGI n. sp.

Of relatively larger size, being fully 1 mm. long. General colour dark brown, legs, antennae and palpi paler. Head a little shorter and much narrower than the pronotum, rounded behind the eyes; surface smooth, with only two indistinct, not well defined, small dimples near either antennal base. Eyes moderately large, hardly longer than the marginal space behind them, very little protruding. Maxillary palpi (fig. 2*a*) pale lemon yellow; basal joint inversely infundibuliform, strongly widened basad, constricted distad; second joint almost cylindrical, somewhat widened distad, with the outer distal angle produced; third joint obliquely ovate, strongly constricted at extreme base, transversely truncate at apex; apical joint staff-like, about as long as the preceding one, with a blunt, setigerous angle near base at outer margin. Antennae (fig. 2*b*) considerably shorter and stouter than in the allied species (fig. 2*c*, *d*), third joint not so staff-like, produced in distal half, following joints shorter and thicker, apical joint more narrowed and less round towards the tip. Colour of antennae bright ferruginous, distad becoming gradually more greyish; penultimate joint distinctly greyish-brown infumate in distal half; last joint of this colour throughout its whole length, slightly paler at extreme base and tip only.

Pronotum moderately large, with slightly produced fore angles and rounded hind angles, widest beyond the middle;

sides rounded, margined; fore border emarginate, hind one truncate. The whole disc marked with remote foveolate punctures, especially larger and closer along fore and hind margin; between them throughout the whole surface, very

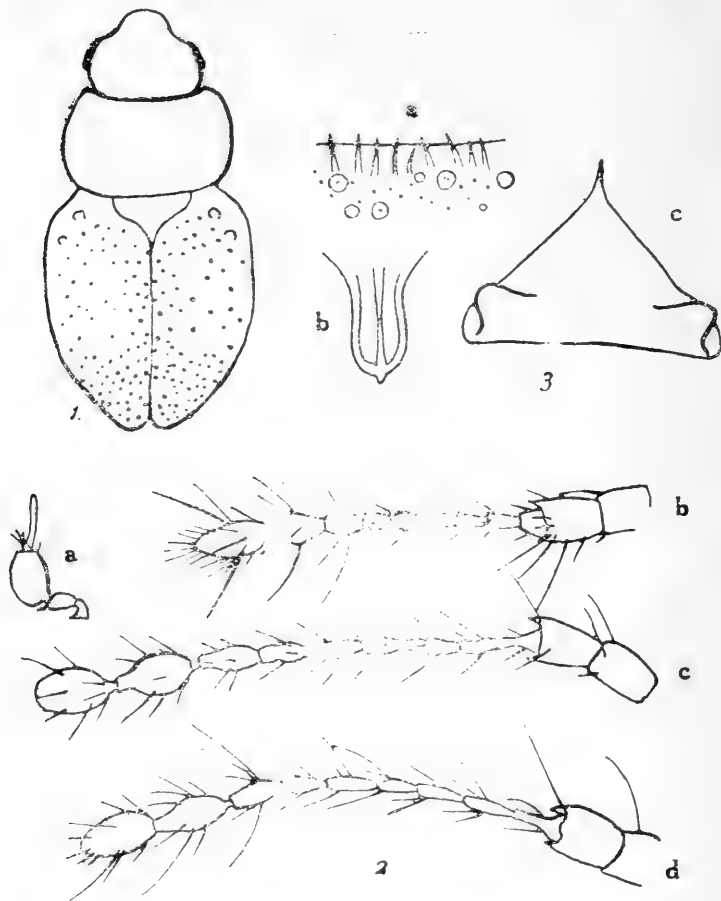


Fig. 1. *Ptenidium mjobergi*. Outline of body, enlarged.
 Fig. 2. *Ptenidium mjobergi*. a Sculpture near fore margin of pronotum. b Prosternal process. c Scutellum. (All equally enlarged.)
 Fig. 3. a Maxillary palpus of *Ptenidium mjobergi*. b, c, d, Antennae of *Ptenidium mjobergi* (b), *punctatum* Gyllh. (c), and *reitteri* Flach (d). (All equally enlarged.)

fine, impressed dots. Along the fore margin, a row of thick, rather transparent horn-like setae is arranged (probably sense cones; fig. 3a). Prosternal processus (fig. 3b) rounded at apex, with sharply bordered lateral margins, and with a prominent median carina which overreaches backwards the rounded apical margin; between this carina and the lateral borders on either side a long broad sulcus.

Scutellum (fig. 3c) large, triangular, strongly pointed at apex, with a lobe-like processus near either basal angle. Foveolate punctures along basal cross sulcus not visible, perhaps obstructed by the hind margin of pronotum. Tegmina twice as long as wide, widest before the middle, then gradually tapering distad, narrowly rounded at apex. General colour greyish-brown throughout, apical part darkened again. Surface in the humeral region with two callosities which are more transparent than the surroundings; dark punctures are closely arranged along all margins, much less numerous on the middle area; between them throughout the whole surface very fine, impressed dots. Legs rather long and stout, of the usual shape, ferruginous.

Measurements:—Head 0.23 mm. long, 0.27 mm. wide; antennae 0.30 mm. long; pronotum 0.26 mm. long, 0.41 mm. wide; tegmen 0.52 mm. long, 0.26 mm. wide.

One specimen from Mt. Poi, 4000 feet, which I have named after its discoverer, Dr. E. Mjöberg.

This new species comes in the key of Matthews (p. 77) near *Pt. punctatum*, in that of Flach (p. 493-499) to the subgenus *Gillmeisterium*. From all these European species it is distinguishable at once by the thick, short antennae which do not reach the hind margin of pronotum in *Pt. mjobergi*, whilst overreaching it in the other species. Thus in fig. 2b--d the antennae of *Pt. mjobergi* are (at the same enlargement) absolutely shorter than in *Pt. punctatum* and *Pt. reitteri*, whilst the former species is larger than both the others. From the Ceylonese *Pt. marcocephalum* Neitner differing by the shape and sculpture of pronotum; whilst in the Japanese *Pt. magnum* Ericson (1909) the prosternal processus has no median length sulcus. As to the sculpture, *Pt. lawsoni* from New Zealand, seems to be more closely allied with my new species than any other, but it has (after the description by Matthews) long, slender, paler antennae and its body is broader, more ovate and convex even than in *Pt. punctatum*, whilst *Pt. mjobergi* is scarcely as broad and ovate as this European species.



XXIII.—Anthribidae from Northern Sarawak. By DR. K. JORDAN.

The twelve specimens of this family obtained on Dr. Mjöberg's expeditions belong to nine species, of which two are undescribed.

1. ACORYNUS PASSERINUS Pasc. (1860).

Tutau River (W. Kalabit country).

2. ACORYNUS PHEBUS n. sp.

Near *A. passerinus*. Rostrum narrower between the antennae, its dorsal intermediate carinae not parallel with the median carina, but converging distally. Eyes more prominent, the outline of the occiput and frons in a lateral aspect therefore less slanting.

Pronotum more strongly depressed transversely, the dorsal carina more convex towards the sides, and with a minute median angle directed backwards; the luteous pubescence of the sides much more extended than in *A. passerinus* and with a more whitish-grey tint; a brown lateral arciform mark as in the allied species and above it a small subapical longitudinal spot, the brown central area strongly and almost evenly narrowed from the carina forward, being anteriorly about as wide as the third antennal segment is long and posteriorly, suddenly widened behind the carina; in middle a luteous grey linear spot across the carina and further forward a shorter one.

Elytra broader than in *A. passerinus*, behind subbasal swellings distinctly depressed across suture, stripes of punctures deeper, third interspace slightly elevete and bearing a greyish-white line from subbasal swelling to brown median patch and a second, shorter, line behind this patch, the markings otherwise almost the same as in *A. passerinus*. Apical two-fifths of tibiae and the second to fourth tarsal segments brown.

Length (head excl.) 4 mm.

One ♀ from Pah Trap (Kalabit country, 3000 feet).

3. *APATENIA VIDUATA* Pasc. (1859).

One specimen from Mt. Dulit, 3500 feet.

4. *XENOCERUS DELATUS* Pasc. (1859).

Specimens from Mt. Dulit and Mt. Murud.

5. *XENOCERUS VARIABILIS* Pasc. (1860).

Specimens from Mt. Murud, 6500 feet.

6. *XYLINADES ASPERICOLLIS* Jord. (1895).

One specimen from Pah Trap and Tutau River (Kalabit country).

7. *APOLECTA DEPRESSIPENNIS* Jord. (1895).

Specimens from Mt. Murud, 6500 feet.

8. *ARAECERUS FASCICULATUS* Degeer (1775).

One specimen from Pah Trap (Kalabit country).

9. *DYSNOS SERICEUS* sp. n.

The largest species known to me. Eyes converging above as in the other species of *Dysnos*, but remaining widely apart. Base of rostrum and of frons impressed. Antennae barely reaching base of rostrum, segment 3 shorter than 4, club shorter and broader than in other species, flat, symmetrical; segments 9 and 10 cordiform, 11 ovate.

Prothorax much broader than long, its sides nearly parallel from base to middle, then strongly narrowing to apex; lateral angle of carina slightly obtuse and a little rounded off, true basal angle of prothorax projecting backwards and outwards, the short basal lateral longitudinal carinula oblique, the angles which it forms with the dorsal and lateral carinae equal in size; the lateral carina extending to near middle.

Scutellum semicircular, somewhat convex. Elytra cylindrical, strongly punctate, striate, alternate dorsal interspaces slightly convex, subbasal swellings very distinct, behind them a transverse depression. Pygidium triangular, with rounded apex and an indication of a smooth median line.

Mesosternal intercoxal process truncate, about as broad as a midcoxa. Third tarsal segment not broadened (♀).

Black, rufescent, variegated above with ill-defined spots of a golden silky pubescence; basal segment of antenna red, end segment rufescent luteous.

Length 5 mm.

One ♀ from Mt. Murud, 6000 feet.



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No. 11.

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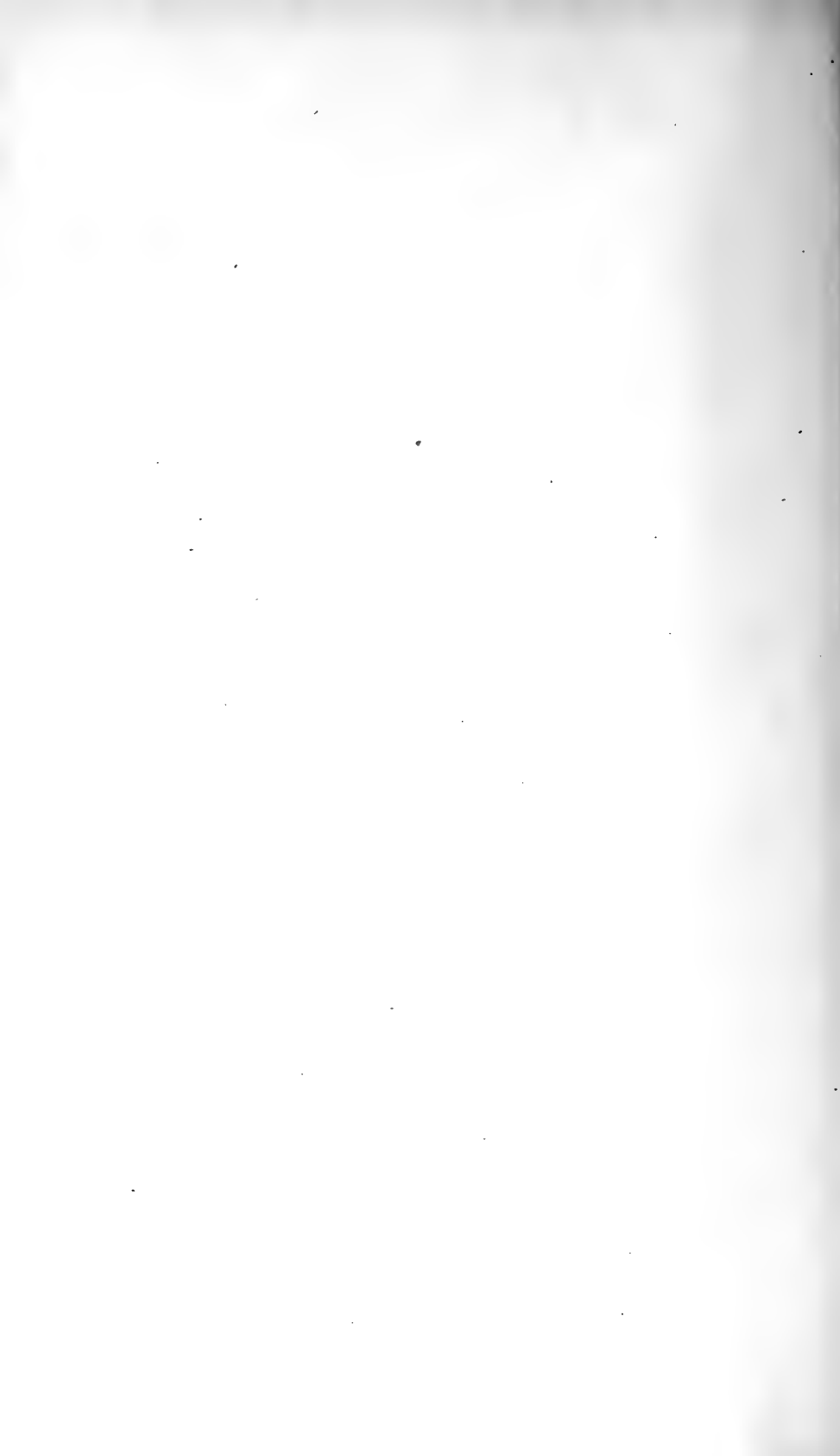
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**XXIV.—On a Collection of Stag-Beetles
(Fam. Lucanidae) from Sarawak.** By
P. NAGEL, Hannover, Germany.

C. —————

The first part of Mr. P. Nagel's study of the Lucanidae was published in the "Sarawak Museum Journal" Vol. III (Part III) No. 10, 1926, pp. 292--302, with one Plate. The following corrections to this paper are, however, necessary.

p. 297 : Under *C. magnificus*, line 3 read "metallicæ, partim cupreo-nitentes, subtus....."

p. 300 : Under *E. mjobergi*, line 3/4 read "margine antico ad labrum duobus foveis parvis instructo, nec perpendiculariter truncato".

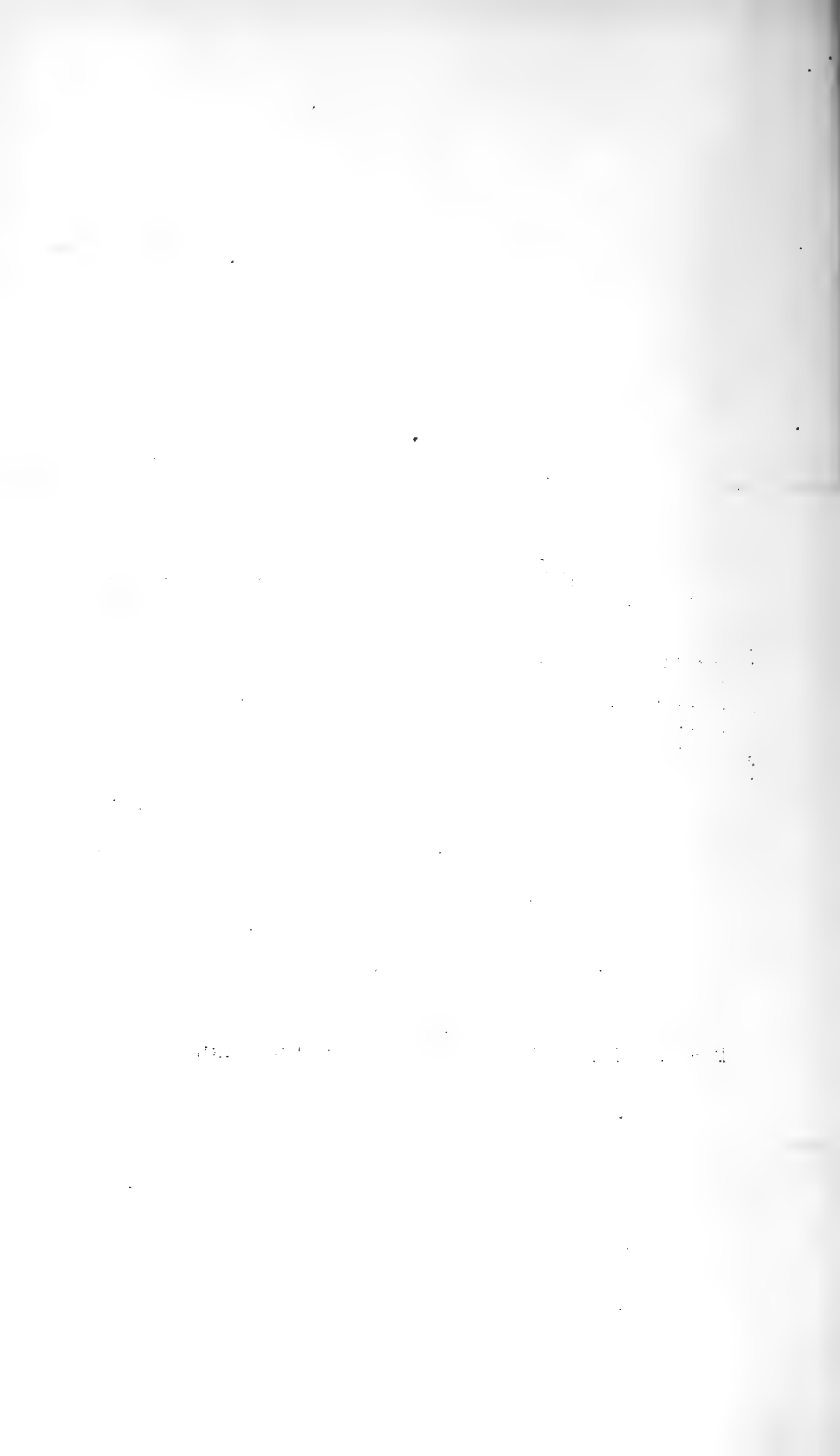
E. mjobergi is apparently a synonym of *Eur. thoracicus* Moll. (Veste Didier, Encycl. Ent. Paris, Coleopt. 1926, p. 32.)

The Explanation of Plate 12 is moreover incorrect and should be as follows :

- Fig. 3 *Gnaphaloryx pallidus* ♂ sp. n.
- .. 4 *Odontolabis leuthneri* var *brunnea* ♂ var. n.
- .. 5 *Gnaphaloryx borneensis* ♀ sp. n.
- .. 6 *Xenostomus krieschei* ♀ sp. n.
- .. 7 *Aegus punctatissimus* ♂ sp. n.
- .. 8 .. *falcicornis* ♂ sp. n.
- .. 9 .. *sexlineatus* ♂ sp. n.

The second part of his paper is published herewith.

ad apicem (in Gn. velutino sordidæ usque ad medium inter-
2 longitudinalibus setosis instructa; apice rotundata. Pedibus
punctatis, tibiis anticis pluridentatis, coeteris unispinis (in
Gn. velutino inermibus).



**XXIV.—On a Collection of Stag-Beetles
(Fam. Lucanidae) from Sarawak.** By
P. NAGEL, Hannover, Germany.

G. TRISCUSPIS.

The type of *G. tricuspis*, a most rare and interesting species was described from Solok (Sumatra); to my knowledge this species is now recorded also from Borneo for the first time (S. M. J., No. 10, p. 302).

G. BORNEENSIS nov. spec. (Fig. 5).

♂ ignotus.

♀ *Gnaph. velutino* consimilis. Supra fuscus, subferrugineo velutinus, haud nitidus; subtus brunneus, omnes partes punctatissimæ et puncta omnia seta singula lutea ornata. Capite densissime punctato; margine antico recto, angulis anticis valde rotundatis; inter oculos longitudinaliter depresso, in medio tuberculo transverso instructo. Cantho postice rectangulariter truncato ut in *Gn. velutino* ♀. Clypeo porrecto, rotundato ac punctato. Mandibulis capite brevioribus, punctatis, nitidis, supra canaliculatis. Mento semicirculariter rotundato, valde rugoso (in *Gn. velutino* angulis rotundatis, sparsim punctato). Prothorace transverso, capite latiore, angulis anticis productis rotundatisque, lateribus antice convergentibus (in *Gn. velutino* parallelis), dense punctato, margine punctisque dense velutinis. Scutello subtriangulari, punctato, setoso. Elytris prothorace haud latoribus, illo certe $2\frac{1}{2}$ longioribus, elytra singular longitudinaliter 5 carinis setosis, inter carinas singulas a base fere usque ad apicem (in *Gn. velutino* solum usque ad medium) lineis 2 longitudinalibus setosis instructa; apice rotundata. Pedibus punctatis, tibiis anticis pluridentatis, coeteris unispinis (in *Gn. velutino* inermibus).

Gn. velutino ♀ appropinquat, sed illo maxime differt: 1. mandibulis supra canaliculatis, clypeo producto rotundatoque, mento rugoso; 2 capite longitudinaliter depresso et tuberculo instructo; 3. prothoracis latitudine lateribus haud parallelis; 4. interstitiis elytrorum lineis 2 longitudinalibus a basi fere usque ad apicem instructis; 5. tibiis intermediis posticisque unidentatis.

Longitudo corp. 17 mm; latitudo elytr. 7 mm;

Hab. Mons Dulit (Sarawak) Borneo Septentr.

This species is allied to *Gn. velutinus* Thoms. (Ann. Soc. Ent., France (4) ii, 1862, p. 426), but clearly distinguished from it by several characteristic signs. The head is more finely punctured, the clypeus porrected and rounded, not broad and short. Between the eyes we may observe a longitudinal groove and in the middle of the head is provided with a transverse oval tubercle. The mandibles are channelled and not rounded on the upperside; if they are closed, the clypeus fills out the whole space between them. Mentum rugose. The prothorax is smoother, its sides convergent anteriorly. The squamose 5 costae upon each elytron are not developed so distinctly as in *Gn. velutinus*, but the two intermediate lines between the costae reach from the base nearly to the tip, which is rounded. The undersurface is brown and deeply punctured and rugose; each point bears a golden bristle, which is short on the abdomen, but longer on the metasternum. The four posterior tibiae are armed somewhat below the middle with one spine.

1 ♀. The type in the Sarawak Museum's collection.

ÆGOTYPUS Parry.

1. Æ. TRILOBATUS Parry.

Pro. Ent. Soc. London 1862, p. 113; Trans. Ent. Soc. London, (3) II, 2864, p. 59, t. 7, fig. 7 ♂; 1. c. 1874, p. 371.

Mt. Murud, 11 ♂, 4 ♀. Mt. Duilt, 1 ♂, 2 ♀.

Male specimens in all degrees of development from 11--13, 5 mm. Major Parry has said in his diagnosis from the mandibles: "mandibulis robustis, intus ad basim unidentatis". The mandibles of the largest males are slender, but they have 2 small teeth near the base; in all other parts they are completely conformable with the smaller specimens.

AEGUS McLeay.

1. AE. AMICTUS Deyr.

Ann. Soc. Ent. Belg. ix, 1865, p. 35, t. 2, fig. 8.

Mt. Murud, 3 ♂.

2. AE. FALCICORNIS nov. spec. (Fig. 8.)

♂. Piceus, nitidus, *Aeg. hamato* Jakowl. appropinquans. Capite transverso, opaco, tenuiter et sparsim punctato, valde fornicato, et in medio leviter depresso; hic puncto singulo profundo et magno instructo, lateribus parallis, angulis anticis posticisque rotundatis, margine antico late excavato. Cantho angustissimo. Mandibulis capite fere duplo longioribus, valde incurvatis et elevatis, dente basali magno et truncato, ante medium dente secundo instructis. Prothorace transverso nec capite latiore, lateribus tenuiter punctatis et postice convergentibus, in disco nitio, angulis anticis rotundatis, posticis truncatis. Scutello impunctato. Elytris prothorace angustioribus, nitidissimis, 9—striatis, striis 3 externis punctatis et aureo-pilosis. Subtus piceus, omnibus partibus nitidissimis. Mento opaco, excavato, sparsim et tenuiter punctato. Abdomine punctato. Tibiis anticis glabris et 2—3 dentibus parvis instructis, 4 posticis striato-pilosis. intermediis spina minuta, posticis inermibus. Long. corp. (mand. excl.) 12 mm; mand. 3 mm; latit. max 5 mm.

♀ ignota. Hab. Mt. Penrissen, Sarawak, Borneo Septentrionalis.

This species is allied to *Aeg. hamatus* Jakowl. and to *Ae. malaccus* Thoms. Pitchy black, legs somewhat clearer. The head is dull and much vaulted, its centre slightly depressed, so that on each side of the head a large gibbosity is formed; some of the very fine punctures may be seen only with the glass; in the middle of the head exists a singular deep puncture. The anterior margin is broadly excavated, the ocular canthus very narrow. The mandibles are much rounded and elevated; they are nearly twice as long as the head and stronger than in *Aeg. malacco*; the denticulation has the inversed form as in *Aeg. hamato*. The large truncated median tooth of *Ae. hamatus* is placed at the base in the new species and its median tooth is slender, triangular and forwards. The prothorax has the sides dull and finely punctured, the disc very shining;

the sides are straight and convergent behind, the anterior edges rounded, the posterior truncated. The much shining elytra are narrower than the prothorax; they have 9 stripes; the 3 outer ones punctured and covered with golden bristles. The scutellum is shining. The underside excepted, dull and sparsely punctured mentum is very shining, the abdomen provided with deep punctures. The front-tibiæ armed with 2-3 little teeth are shining, the 4 posterior bear stripes of golden pubescence; the intermediate ones have a minute spine, the posterior are unarmed.

2 ♂ Mt. Penrissen and Mt. Poi, Southern Sarawak, The type in the Sarawak Museum, the cotype in my own collection.
♀ unknown.

3. AEG. HAMATUS Jakowl.

Horae Soc. Ent. Ross. xxxiv, 1900, p. 635.

1 ♂ Kalabit Country, ♂ Pah Trap, 1 ♀ Mt. Dulit.

4. AEG. IMPRESSICOLLIS Parry.

Trans. Ent. Soc. London. (3) II, 1864, p. 58, t. 5, fig. 3.

2 ♀ Mt. Murud and Songei Tutau.

5. AEG. MALACCUS Thoms.

Revue Zool. 1856, p. 516 (= *rectangulus* v. Voll. Tijdschrift Ent. iv, 1861, p. 114, t. 7, fig. 7; 1. c. viii, 1865, p. 156.)

2 ♂, 1 ♀, Pah Trap.

6. AEG. OGIVUS Deyr.

Ann. Soc. Belg. ix, 1865, p. 33, t. 2, fig. 5, ♂.

4 ♂, 1 ♀, Lio Matu; 4 ♂, 2 ♀, Mt. Poi; 4 ♂, 2 ♀, Mt. Murud.

7. AEG. PARALLELUS Hope (Westw.)

Cat. Lucan. 1845, p. 22. Westw. Trans. Ent. Soc. Lond. 1864, p. 56.

2 ♂ Lio Matu, Mt. Murud.

8. AEG. PARRYI Waterh.

Ann. Mag. Nat. Hist. (6) v, 1890, p. 37.

2 ♂ Mt. Murud, Pah Trap.

9. *AE. PUNCTATISSIMUS* nov. spec. (fig. 7.)

♂ Niger, subtus piceus. Capite transverso, punctatissimo, fornicato, margine antico late excavato; angulis anticis rotundatis, ante oculos gibba instructo. Mandibulis gracilibus, incurvatis, capite $1\frac{1}{2}$ longioribus, tenuissime punctatis, dente basali parvo et retrorso directo, ante medium dente parvo sursum ac introrsum directo instructis. Prothorace capite latiore, punctatissimo, lateribus fere parallelis, leviter excavatis, angulis anticis posticisque truncatis. Scutello punctato. Elytris prothoracis latitudine, angulis humeralibus acutis, 7 punctato-striatis, interstitiis nitentibus, interstitio suturale punctato, interstitiis 3 et 5 ad apicem conjungentibus, margine late punctatissimo et griseo-piloso. Subtus punctatissimus. Mento excavato. Tibiis striato-pilosis, anticis 3—4 denticulatis, intermediis 2 spinis instructis, posticis inermibus. Long. corp. (mand. excl.) 14,5 mm; mand. 3 mm; latit. max. 6 mm. Hab. in monte Murud, Sarawak, Borneo septentr.

♀ ignota.

This species belongs to the group of *Aeg. capitatus* Westw. It compares well in size, and is deeply and very thickly punctured on the head, on the prothorax and the bears before the eyes the usual tubercles. The mandibles are more slender, curved inwards and very finely punctured; they have a small basal tooth directed backwards and inwards; somewhat before the centre a smaller tooth which arises on the upper margin directed upwards and inwards. The prothorax has the anterior and posterior angles broadly truncated; it is broader than the head, its sides are nearly parallel and somewhat excavated. The elytra have 7 punctated stripes, the intervals are shining, the sutural-interval punctured. The sides of the elytra are broadly and thickly punctured and covered with bristles. The stripes and intervals finish before the tip of the elytra, the 3rd and 5th interval are joined at the end. The undersides is pitchy-brown; the tibiae have longitudinal stripes of short bristles. The front tibiae are 3--4 denticulated, the intermediate have 2 small spines, the posterior are unarmed. The type, 1 ♂, in the Sarawak Museum's collection.

10. AEG. SEXLINEATUS nov. spec. (Fig. 9.)

♂ Niger, elytra picea lateraliter fortiter punctata et griseo-pilosa. Capite subsurdo, in disco sparsim sed perspicue, lateribus dense punctato; lateribus postice divergentibus; angulis anticis truncatis, posticis rotundatis, ante oculos tuberculo instructo, margine antico valde-fere semicirculariter-excavato. Mandibulis capite longioribus, ad basim subsurdus apicibus levis, leviter incurvatis, dente basali retrorso directo et in meido dente breve triangulo instructis. Antennis nigris. Prothorace capite latiore, subsurdo, dense et ad latera fortiter punctato, in medio leviter depresso, angulis anticis posticisque truncatis et hic leviter incurvatis, lateribus fere parallelis. Scutello punctato. Elytris prothoracis latitudine, 6—striatis, humeris et lateribus punctatissimis; interstitio suturale punctato, interstitio secundo in exordio et in latere inferiore punctato, ceteris levis, Subtus piceus, punctatus; mento valde excavato, punctato. Genis epipleurisque punctatis. Metasterno depresso. Abdomine aureo-piloso. Tibiis striato-pilosis, anticis 5--6, intermediis unispinosis, posticis inermibus.

Long corp. (mand. excl.) 20 mm; mand. 5,5 mm; latit. max. 9 mm. Hab. in monte Murud, Sarawak, Borneo septentrionalis.

♀ ignota.

This species belongs also to the section of *Ae. capitatus* Westw. The head and the prothorax are black, dull, diffusely and at the sides coarsely punctated. The anterior angles of the head are truncated, the posterior rounded; front margin deeply excavated, the excavation limited by an acute tip on each side. The mandibles are slender, flattened, each one armed with two teeth; the basal tooth long and directed backwards, the median triangular tooth arising on the upper margin is short and not curved upwards and inwards, but directed immediately inwards. Prothorax broader than the head, the anterior and posterior angles truncated and the truncation somewhat excavated; the sides nearly parallel; in the disc we may observe a faint groove. The elytra are pitchy-black and have 6 longitudinal deep stripes. The sutural interval is punctured and finishes at the tip of each elytron; the second is punctured only in its beginning and on the interior sides. the other-ones are smooth; the shoulders and the outer margin

deeply punctured on $\frac{1}{3}$ of the breadth of the elytra. The underside and the legs pitchy-black, most of the parts punctured. Mentum excavated and punctured. Metasternum depressed. The anterior tibiae are armed with 5--6 strongly developed teeth, the intermediate-ones have a little spine, the posterior are unarmed. All tibiae bear stripes of grayish bristles.

1 ♂, the type, in the Sarawak Museum's collection.

XENOSTOMUS Boileau.

1. X. KRIESCHEI nov. spec. (Fig. 6.)

♂ ignotus.

♀ Supra piceus, subferrugineo velutinus, haud nitidus. Capite transverso, dense punctato, punctis subferrugineo velutinis, ante oculos et in disco bigibboso, angulis rotundatis, margine antico recto emarginato, angulis truncatis. Mandibulis capitis fere longitudine, nitidis, punctatis et supra canaliculatis, unidentatis. Mento punctato, valde excavato, margine antico piloso. Cantho angusto, angulis posticis nec rectangulariter truncatis. Prothorace transverso, capite latiore, lateribus fere parallelis, postice perpaulo divergentibus, dense punctato, punctis subferrugineo velutinis, angulis anticis posticisque rotundatis, medio in disco levissime striato. Elytris prothorace latioribus, angulis anticis acutis, posticis valde rotundatis, fornicatis, longitudinaliter 6—striatis, interstitiis dense punctatis, punctis omnibus dense subferrugineo velutinis. Subtus punctatus. Femoribus punctatis, punctis femorum abdominisque velutinis. Tibiis striato-pilosis, anticis 3--4 dentatis, 4 posticis unispinosis. Pedibus pilosis.

Long. corp. 17,5 mm; latit. elytr 7 mm;

Hab. in Monte Murud, Borneo Septentrionalis (Sarawak.)

Xen. punctipenni Parry (*ritsemae* Boil.) 1. statura graciliora, corpore magis fornicato; 2. angulis anticis capitis rotundatis; 3. capite prothoraceque ac elytris tenuiter punctatis; 4. punctis omnibus dense subferrugineo velutinis maxime differt.

I will compare *Xen. krieschei* with *Xen. punctipennis* Parry (= *ritsemae* Boil., Bull. Soc. Ent. France 1898, p. 265), a most common species in Borneo and Sumatra. The new species is

distinguished by its punctures thickly covered with brownish short hairs, in which it resembles *Gnaphaloryx velutinus* Thoms., but all punctures on the whole body are not so large and deep as in *Gn. punctipennis*, so that the upper surface is much smoother. The head has the anterior angles rounded, the small ocular canthus is not rectangular, truncated backwards; the excavated clypeus is broader than in the named species, with truncated angles. The mandibles are more slender and armed with an obtuse tooth (which is bifid in *Xen. punctipennis*). The body is more slender and vaulted. The prothorax has the rounded anterior angles not so produced and shows a very indistinct longitudinal groove on the disc. The elytra are more rounded at the tip and also the scutellum is more rounded. The femora have several longitudinal hairy stripes. The 4 posterior tibiae are armed with a spine somewhat below the midst. I name this species in honour of Dr. med. R. Kriesche, Berlin-Wilmersdorf, who has aided me to correctly identify the Sarawak specimens.

1 ♀, the type, in the Sarawak Museum's collection.

12. NIGIDIUS McLeay.

1. N. KINABALUENSIS Rits.

Notes Leyd. Mus. xix, 1897, p. 187.

1 ♂ River Tutau.

13. FIGULUS McLeay.

1. F. IMPRESSICOLLIS Rits.

Not. Leyd. Mus. xvii, 1896, p. 139.

1 ♂ Kalabit Country.

2. F. SUBCASTANEUS Westw.

Ent. Mag. v, 1838, p. 263. Burm. Handb. v, 1847, p. 438.

1 ♂ Baram Station.

This species described from Java is new for Borneo.

14. GARDANUS Westw.

1. C. SULCATUS Westw.

Ann. Soc. Nat. (2) i, 1834, p. 113, t. 7, fig. 1—Burm, Hamdb. v, 1847, p. 440. (= *Cornutus* Gray in Griff. Ann. Kingd. 1832, t. 46, fig. 3).—Cast. Hist. Nat. ii, 1837, p. 175.

1 ♀ Kuching.

**XXV.—A Revision of the Dytiscid-genus
Lacconectus (Motsch.)** By A. ZIMMERMANN.

Through the kindness of Dr. E. Mjöberg, I have received for determination a small collection of *Dytiscids* belonging to the Sarawak Museum. The material comprises besides some common species, two specimens of the apparently very rare *Pleurodytes dinentoides* Sharpe and numerous specimens of *Lacconectus fulvescens* Motsch., previously recorded only from India and therefore new to Borneo.

This zoo-geographical statement has given me reason to revise the interesting genus and to give a key to all known species, adding also the description of a new form.

A.—Dorsal side nearly smooth or only very finely punctured
.....Group I.

B.—Dorsal side with deep, rounded punctures or distinctly
transversely striated.....Group II.

GROUP I.

1. Elytra as well as the whole body, brownish red.
2. Size large, 4.3--5 mm.
3. The punctures of elytra, though fine, yet quite recognizable by use of larger magnification. Striæ of elytra strong; besides the two middle ones, the punctures of which are very densely placed, there are three more striæ, one near the suture, consisting of only very few punctures, a second one in the middle and a third one near the lateral margin.

L. BASALIS Sharp.

4. Elytra at the base with a blackish, in the middle slightly wider border, behind this an obsolete yellowish crossband consisting of two or three confluent maculæ.

Broad—oval, slightly convex; ventral side reddish, epipleuræ blackish except near the base; dorsal side also reddish, head near the eyes, the eyes and the prothorax in the centre, slightly darker; elytra shining, slightly iridescent, yellowish-brown, the above mentioned subbasal band and a broader lateral band posteriorly lighter yellowish, the latter not quite reaching to the margin but interrupted by a narrow blackish band, which behind the middle takes the shape of a small macula and before the middle continues as a much broader band reaching the shoulders. Dorsal side with very fine, on the head and prothorax somewhat stronger reticulation; elytra finely and not deeply, but fairly densely punctured; the four basal joints of the fore and middle tarsi in ♂ fairly strongly dilated.

Length of body 5--5.5 mm.

Locality: Burma, Cochin China.

4a Elytra at the base slightly lighter coloured than on the disc, but the colouration vague, not forming a crossband; basal margin without darker-band.

L. RITSEMAE Reg.

5. Body 4.6--5.2 mm.; lateral margin of elytra with narrow blackish band.

Oval, only slightly convex, moderately shining, the whole body yellowish-reddish, only the head near the eyes and the prothorax anteriorly and on the disc vaguely darker coloured; elytra light brownish, showing vague signs of a yellowish-red colouration near the base and on the disc; the reticulation with extremely fine punctures, more indistinct behind the middle, posteriorly disappearing almost entirely and showing only somewhat stronger punctures; striæ distinct; the four basal joints of the fore and middle tarsi in ♂ only slightly dilated, only slightly broader than in ♀.

Locality: Java, Burma.

L. LIVIDUS Reg.

5a Body 4.5 mm.; lateral margin of elytra not darker coloured.

Slightly smaller than *L. ritsemæ* the colouration of elytra nearly uniform, the lateral margin not darkened, the disc hardly noticeably darker than the base; punctures, reticulation and striæ as in the preceding species. Perhaps only a variety of it!

Locality : Burma, Tenasserim.

L. FULVESCENS Motsch.

3a Dorsal side with indistinct punctures, nearly smooth, striæ fine, secondary ones very faint; no puncture near the suture.

Easily distinguished from the preceding species by the smaller, more narrowly oval body, by the much finer striæ and the extremely fine hardly noticeable punctures, which become more distinct towards the posterior half; the colouration in general is the same, but the head more extensively and strongly darkened; elytra more shining, brownish-yellow without any limited maculæ; the reticulation is very fine and regular all over.

Length of body 4-4.2 mm. (forma typica).

The specimens from Borneo are larger, (4.3 mm.) body more tapering towards the ends, the darker colouration of prothorax forms a discal macula, the elytra dark brown with the lighter coloured parts less outstanding; the lateral margin blackish; the reticulation is very much finer, hardly any longer noticeable and almost absent on the posterior parts of elytra.

Localities : North India, Tenasserim; Borneo : Sarawak, Mt. Poi (3000 feet), Mt. Penrissen (3500 feet), leg. Dr. E. Mjöberg, Mt. Matang.

L. OCEANICUS Reg.

2a Size smaller, 3.5--3.7 mm.

The smallest species of the genus, very similar to *L. fulvescens* but easily distinguished by the smaller size, by the posteriorly more elongate and more strongly tapering shape, by the still finer, posteriorly entirely obsolete striæ of elytra and by some differences in colouration; the darker shadows on the disc of prothorax much more extensive; elytra at the suture and at the base narrowly, at the lateral margin comparatively broadly darkened; the subbasal lighter cross-band stands out fairly distinctly against the uniformly light-brown background; the reticulation especially in ♂, very fine, the details no longer definable; punctures entirely absent.

Localities: Mentawi Islands and Balabac.

GROUP II.

1. Dorsal side to the greatest extent yellowish-red or brownish-red.

L. STRIGULIFER n. sp.

2. Elytra with two faint striæ and numerous short rows of punctures.

In my work, "Neue Schwimmkafer" (Ent. Blatter., xix, 1923, p. 36) I refer to a *Lacconnectus* species from India, which in spite of its striking and aberrant sculpture was not described as a new species chiefly owing to fact that I had access only to a single female specimen. I did not feel quite sure that we did not have to do with a dimorphic sexual sculpture. Later on, however, I received also a single male specimen from the same locality, which makes sure that it represents a species of its own.

Broadly oval, in shape and size nearest to *L. lividus*; brownish-yellow, moderately shining; posterior coxæ slightly darker; head near the eyes darkened; on the prothorax broader shadows in the middle and on elytra a fine sutural line and a triangular-shaped marking, in the middle of the base brownish;

the subbasal crossband as in *L. basalis*, but does not extend so far towards the margin and does not reach the shoulder; reticulation distinct everywhere; macro sculpture consisting of numerous fine and very short streaks, which in the middle of prothorax are less numerous and which take the shape of irregular punctures near the ends of elytra, but which otherwise are regularly distributed; the four basal joints of the fore and middle tarsi in ♂ fairly strongly dilated.

Locality: India.

L. PUNCTIPENNIS n. sp.

2a Elytra with two strong discal striæ and scattered and strong punctures.

In size, shape, and colouration nearest to *L. basalis*, but not quite so broadly oval; above and underneath yellowish-red. head near the eyes blackish; across the disc of prothorax a darker shadow; elytra slightly darker, brownish-red, a narrow basal band and at the lateral margin a fairly broad band, not reaching quite to the end, blackish; a band near the suture and a subbasal indistinct crossband, externally limited by the dark shoulders, yellowish-red; head and prothorax with distinct reticulation and small microscopic punctures; elytra on account of the almost entirely absent reticulation more shining, with double punctures consisting of extremely fine and very densely and regularly arranged points and much stronger irregularly arranged ones; the discal striæ strong.

Locality: Banjoewango (Java). leg. MacGillavry; one specimen in my collection.

1a Dorsal side to the greatest extent black.

L. BICOLOR Zimm.*.

3 Ventral side red.

A species easily recognized by its size and colouration; oval, slightly convex, underneath red, above dull black, shining; head with exception of a brownish shadow near the eyes and a broader irregular lateral border on prothorax, red; sometimes the latter is completely uniformly red; elytra with two subbasal

* Ent. Blatter. xix, 1923, p. 36.

maculae which sometimes form a crossband; there is also a sublateral macula in the middle and a diffuse broad crossband before the end; as a rule the colouration is faint and indistinct; reticulation extremely fine, very regular and finely punctured; the striae of elytra moderately strong, also the two medium rows normal, the one near the suture marked by some points in the posterior third.

Length of body 6.5--7 mm.

Locality: South India.

L. SIMONI Reg.*.

3a Ventral side brownish black.

Abdomen reddish, prosternum, the base of epipleurae, legs, antennae and palpi reddish-yellow; above black, head anteriorly and a big macula red; prothorax with a broader lateral margin dilated behind the eyes; elytra as a rule with a red marking, consisting of two subbasal, a sublateral one in the middle and one before the end, which latter is combined with the lateral one; of the two basal maculae the interior small, rounded, often missing, the external one much bigger, transverse, reticulation very fine, especially on elytra, which, as also the prothorax (less in the ♀) is covered by strong, very short, deeply impressed streaks, among which the two discal striae stand out only faintly.

Locality: Ceylon.

* Another species, *Lacconnectus festae* Griff. from Ecuador is unknown to me. The species in colouration is similar to *L. basalis* but seems to be distinguished by its size (6.5 mm.) and the lack of striae of elytra. The occurrence of a species of this genus otherwise confined to the Indo-Malayan region, is certainly strange. A closer examination, however, will perhaps show that *L. festae* has to be entered within the very closely related American genus *Aglymbus* Sch.

XXVI.—Platypodidae from Borneo. By LT.-
COL. WINN-SAMPSON, F.E.S.

Many small consignments have been received from time to time from this locality, and more recently a large collection made by Dr. Mjöberg, late Curator of the Sarawak Museum. From these sources and the collection in the British Museum, the following list has been compiled, but owing to want of time and the arrival of still more material which will require to be carefully examined, the *Platypodidae* only are now dealt with.

FAMILY PLATYPODIDAE.

Genus *CROSSOTARSUS* Chapuis.

Group *CROSSOTARSI GENUINI*, Chap.

Crossotarsus cincinnatus, Chap.

Originally described by Chapuis from Borneo, but this locality is not given by Strohmeier (Gen. Insect. Wytsman, 1914, p. 33) who only mentions "Sunda Islands," from which place I have not seen any specimens. It appears to be rarely met with and the most recent capture was made by Mr. G. E. Bryant on Mt. Matang in 1915. The male (nec. Chap.) is unknown.

Type in the British Museum.

Crossotarsus pencillatus, Chap.

Chapuis gives the locality as Sarawak, and a series of both sexes was taken on Mt. Matang in 1915 (G. E. Bryant); other specimens have been taken at Kuching.

Type in the British Museum.

Crossotarsus wallacei, Thompson.

The localities mentioned by Chapuis are Singapore and Sarawak, to which Strohmeier adds Sumatra, and in my collection there is a single specimen labelled "Java," but with no collector's name.

Group CROSSOTARSI BARBATI, Chap.

Crossotarsus barbatus, Chap.

Described by Chapuis from the Moluccas, Ceram, Bouru; there are also two females (nec Chap.) in my collection from Borneo (teste Blandford).

Type in the British Museum.

Group CROSSOTARSI CANCELLATI, Chap.

Crossotarsus wollastoni, Chap

Chapuis described the female (lege male) from Sarawak, and recently, in a series received from Quop, W. Sarawak (G. E. Bryant) there is a female (nec Chap.) which is probably the same species, but more material is required before the question can be settled.

Type in the British Museum.

Group CROSSOTARSI TREPANATI, Chap.

Crossotarsus trepanatus, Chap.

I am unable to trace any specimens of this very distinct beetle except the type from the Wallace collection, captured in Sarawak.

Group CROSSOTARSI SUBDEPRESSI, Chap.

Crossotarsus saundersi Chap.

Both sexes were described by Chapuis from Celebes and Borneo, and Strohmeier does not add any others, but there are specimens in my collection from Sumatra (teste Blandford), also from Penang (G. E. Bryant leg.), India, Charval Div. (Dr. C. F. C. Beeson), and the Philippines.

Type in the British Museum.

Crossotarsus fragmentus, Samp.

Type was described from Singapore, and it has been suggested by Strohmeier (Gen. Insect. Wytsman, 1914, p. 35) as probably the male (nec Chap.) of *C. squamulatus* Chap., but long series of both sexes bred from Sundri wood by the Imperial Forest Zoologist at Dehra Dun, India (Dr. C. F. C. Beeson), show that the male is *C. fractus* Samp., which therefore sinks. The present species has been received from Java, Andaman Is., (Dr. Sharpe), and Borneo (Prof. Baker). A small variety of this species has just been received from the Philippine Is., and will be described with the other *Platypodidae* of that locality.

Crossotarsus (Platypus) omnivorus, Lea.

Described from Tasmania by A. M. Lea, under the genus *Platypus*, and also taken in the Illiwarra district, N.S.W. by H. W. Cox, and I have purchased three specimens labelled "Kina Balu, Borneo," one of which is a female.

Although described as a *Platypus*, it has been placed under "incertae sedis" by Strohmeier, but from its similarity to other described species, I am of opinion that it belongs to the above genus and group.

Since writing the above, Mr. W. Froggatt, Government Entomologist, N.S.W., has kindly sent me specimens of both sexes of this species found in "Brush log", Dorrigo, N.S.W., and the Bornean examples agree with these in every essential point.

Genus PLATYPUS CHAPUIS.

Group PLATYPI CUPULATI Chap.

Platypus cupulatus, Chap.

Recorded from Borneo by Chapuis, which locality, however, is not given by Strohmeier who only mentions Molucca and Sunda Is.; other specimens are reported from Tenasserim, Burma, Andaman Is., and Sumatra (teste Blandford.)

Type in the British Museum,

Platypus caliculus, Chap.

The type is described from Siam, to which Strohmeier adds Japan, Tonkin, Yunnan, and Sumatra, and further specimens have been found in Borneo, Andaman Is. (teste Blandford), and the Philippine Is.

It appears to the writer very doubtful whether this species is really more than a variety of the preceding one; the differences given by Chapuis are slight and not constant in long series, and the prothoracic group of punctures are present in specimens of *P. cupulatus* labelled by Chapuis himself, who also pointed out the great similarity between the two species.

Platypus aduncus, Chap.

The type was taken at Sarawak, Borneo, and I am only aware of one subsequent capture of this apparently rare beetle at Sandakan, Borneo (Prof. Baker).

Group PLATYPI SULCATI, Chap.

Platypus politus, Chap.

Chapuis described the male (lege female) from Borneo, and no further specimens appear to have been obtained.

Platypus signatus, Chap.

The type was described from Borneo, and specimens have been taken in Java; and quite recently I have received a pair from the latter locality. The female (nec. Chap.) I am describing in a list of the Javanese Platypodidæ.

Platypus suffodiens, Samp.

Originally described from Burma, it has more recently been taken in India, and specimens of the same species but of much larger size have now been received from Borneo.

Type in the British Museum.

Platypus westwoodi, Chap.

The type described from Borneo, but apparently a rare species.

Type in the British Museum.

Platypus spinifer n. sp.

♂. Front and elytra dark brown, the prothorax a lighter reddish-brown. Front flat, anterior half slightly raised centrally from the epistoma to the centre of the front, almost smooth but laterally and basally surrounded with coarse large punctures; the posterior portion of the front rugose and punctured, the centre of the vertex slightly raised.

Prothorax sub-quadrate, the sides slightly rounded and contracted towards the base; irregularly and coarsely punctured, especially laterally, the base very slightly sinuate, the central longitudinal groove extending obscurely to the centre, and posteriorly continued beyond the basal margin as a strongly grooved, obtuse spine. *Elytra* with the sulci broad and opaque, the interstices convex and shining as far as the declivity and thence granular to the apex; the third interstice broader than the rest, especially towards the declivity, and all are furnished with uniseriate short hairs on the declivitous portion; the transverse apical groove narrow and shining, ending laterally in blunt processes, slightly incurved, with three or four smaller and more pointed serrations above them on the outer elytral edge.

Abdomen having the first four segments convex and opaque, the first being furnished with a large central spine and the second with two equally large lateral ones, all the segments being coarsely punctured. The anterior tibiae on the outer side rugose basally, with three carinae towards the apex.

♀. *Front* furnished with a sub-triangular space just above the epistoma, covered with microscopic transverse ridges and margined with a few large punctures, exterior to which again the surface is strongly rugose; whilst posterior to this space there is a deep depression between the points of insertion of the antennae, the remainder of the frontal surface being very coarsely and longitudinally ridged, with some large but shallow punctures on the space between the eyes, the whole of the front being more or less hairy.

Prothorax oblong, shining, sparsely covered with shallow punctures more especially at the base; the central basal longitudinal groove extending nearly to the centre with elongate patches on each side, consisting of small, clearly margined, round pores, each patch being enclosed by a sharply-defined groove.

Elytra subsulcate until the commencement of the declivity, the first five interstices basally transversely carinate; the declivity longitudinal, rugose, punctate, apically subtriangularly depressed with a narrow apical margin. *Abdomen* with convex segments but without spines.

The anterior tibiae on the outside less rugose than in the male basally and with four carinae towards the apex.

Length, 6.1 mm.; breadth, 1.8 mm.

This species belongs to the group *sulcati* Chap.

Borneo: Quop (G. E. Bryant), Sandakan (Prof. Baker).

Types ♂ ♀ in coll. Sampson.

Group PLATYPI HIRTELLI, Chap.

Platypus curtus, Chap.

Chapuis gives the localities of this species as Singapore and Sarawak, Borneo; and specimens have now been received from India.

Platypus perrisi, Chap.

Determined by Chapuis from Singapore and Borneo; from the latter locality several females (nec Chap.) have recently been received, but no males.

Group PLATYPI BISULCATI, Chap.

Platypus candezei, Chap.

Recorded from Malacca and Borneo by Chapuis; more recently further specimens have been received from the latter locality.

Type in the British Museum.

Group PLATYPI ANTENNATI, Chap.

Platypus cordiger var. *bifrons*, Chap.

Chapuis describes the type from Singapore, and the variety from Borneo. From the latter locality a somewhat mutilated specimen has been recently received (Prof. Baker leg.) which may possibly be the male (nec Chap.) of Chapuis' variety; it has two small but distinct spines on the second interstice at the upper margin of the declivity, placed close together, as well as a single one on the fifth.

Type of the species in the British Museum.

Platypus excedens, Chap.

Described from New Guinea, Dorey. A single specimen has now been received from Borneo (G. E. Bryant),

Type in the British Museum.

XXVII.—Coleoptera (Lagriidae) from Northern Sarawak. By F. BORCHMAN.

The collection of *Lagriidae*, though small, has proved to be an interesting one, containing besides some previously described species also three characteristic new species. Of interest is also the capture of the hitherto unknown ♂ of *Cerogria rhytidonota* Frm. One form from Mt. Penrissen is also referred to here.

1. CEROGRIA RHYTIDONOTA Frm.

(Bull. Soc. Ent. Fr., 1903, p. 301).

Up to now only the ♀ was known.

♂. Length of body 13--15 mm.; very similar to the ♂ of *Cer. gigas* Lap., coppery-metallic shining, bases of femora and sometimes epipleurae of elytra brownish-red; sculpture of elytra, especially towards the end much rougher, anterior margin of prothorax more distinctly set off, the basal impressions deeper; antennae reaching beyond the shoulders, in the middle slightly incrassate; 4th joint nearly twice as long as 3rd, at the apex oblique, 7th joint and especially 9th dilated, tooth-shaped, apical joint as long as joints 5--10 together; shape of body as in *Cer. gigas*; the distance between the eyes as wide as their diameter; vertex slightly impressed; in everything else like *Cer. gigas*. of which *Cer. rhytidonota* perhaps may be only a variety.

Localities: 1 specimen from Kinabalu, 3000 feet, September, 1913; 1 specimen from Mt. Murud, 6000--7000 feet., leg. Dr. E. Mjöberg.

2. *CEROGRIA ORIUNDA* n. sp.

Length of body 12 mm. Closely related to *Cer. cinctrea* Fairm. but differing in following characters:—

Body above to the last third part of elytra with fairly dense, but not very long depressed reddish hairs, the last third and ventral side covered by silvery-grey hairs; prothorax more strongly tapering anteriorly, sides nearly parallel; the dorsal side with many more navel-shaped impressions between the finer ground sculpture. 1 ♀ from Mt. Murud, 6000--7000 feet, leg Dr. E. Mjöberg.

3. *CEROGRIA MACULIGERA* Bm.

1 ♂ with aberrant colouration, having the posterior half of elytra entirely black. Pah Trap, Kalabit country, 3000 feet, leg. Dr. E. Mjöberg.

4. *CEROGRIA DENTICORNIS* Frm.

An extraordinary large size ♀ (25 mm.); from Mt. Penrissen, leg, Dr. E. Mjöberg.

5. *OROPTERA PHYSOPTERA* Bm.

(Arch. Naturg., 1915 (1916), A. Heft, 6, p. 104).

6 ♀ from Mt. Murud, 6000--7000 feet, leg. Dr. E. Mjöberg.

All are considerably broader than the type-specimen from Batu Lawi, which I now recognize as the ♂. The apical joint of the antennæ is also slightly shorter in the Mt. Murud specimens.

6. *HETEROGRIA ATRA* n. sp.

Length of body 6 mm.; convex, shining, dorsal side with long black and white erect hairs mixed together; black mouth parts; forehead and two basal joints of antennæ dark brown; head normal, moderately strongly punctured; clypeus set off by a curved sharp furrow; antennae reaching beyond the shoulders, externally slightly incrassate, 3rd joint longer than 4th, 9th as long as broad, 10th slightly transverse, 11th bent, at the tip obtusely pointed, as thick as the 10th, as long as the 9th and 10th together, the tip reddish, distance between the eyes wide, forehead slightly convex,

tempora rounded, as long as one eye, neck distinct; prothorax somewhat transverse, slightly broader than the head, broadest near the anterior margin, roughly punctured, all sides with a distinct border, anterior border very faint, anterior angles rounded, base with wide border, sides before the hind angles slightly emarginated, at the anterior as well as the posterior margin a row of long erect setae; scutellum smooth, strongly shining; elytra striated, striae deeper towards the sides and reaching towards the tips, interstices slightly convex only, indistinctly transversely rugose, finely punctured, tapering towards the end; ventral side and legs of normal development.

1 ♀ from Pah Trap, Kalabit country, 3000 feet, leg. Dr. E. Mjöberg.

This species is easily separated from its nearest relations by its size and colouration.

7. NEMOSTIRA MELANURA n. sp.

Length of body 6 mm., in general shape recalling *N. sobrina* Brom. from Sumatra; light yellowish-brown, legs with exception of the bases of femora, antennae with exception of the two basal joints and the posterior half of elytra, blackish; moderately shining with fairly dense and fine long erect setae, ventral side with more depressed hairs; head with bottom-sculpture, very finely punctured; clypeus emarginated, separated from the forehead by a sharp curved furrow; forehead flat, tempora rounded, slightly shorter than the diameter of the eye; neck distinctly set off; antennae reaching nearly to the middle of the body, externally slightly incrassate, 3rd and 4th joint similar, apical joint as long as 9th and 10th together, joints not becoming shorter towards the apex, distance between the eyes the same as the diameter of the eye; prothorax slightly longer than broad, as broad as the head, broadest near the anterior margin, constricted before the bases, convex, the sides of the bottom sculpture fine with scattered punctures: anterior border very fine, the basal one much broader, sides not bordered; anterior angles rounded; scutellum small; elytra twice as broad as prothorax, shoulders strongly marked, increasing in width backwards, rounded, behind the shoulders transversely constricted; striae strong but becoming fainter towards the ends, interstices

slightly convex, each with a row of setae and finely punctured; epipleurae finely punctured; tibiae slightly curved; middle of sternum, especially laterally, strongly punctured; abdomen finely punctured; metatarsus of hind legs as long as the joints together.

1 ♀ from Pah Trap, Kalabit country, 3000 feet, leg. Dr. E. Mjöberg.

The species is characterized at once by its small size and the peculiar colouration. It is shorter than *N. sobrina* Bm. and entirely differently coloured.

XXVIII.—Staphylinidae from Mt. Poi & Mt. Penrissen, with descriptions of new species. By MALCOLM CAMERON, M.B., R.N., F.E.S.

OXYTELINÆ.

ELEUSIS HUMILIS Er.

Mt. Penrissen, 4000 feet, a single specimen.

BOROLINUS RUFUS Cam.

Mt. Penrissen, 4000 feet, a single specimen.

PRIOCHIRUS MOULTONI Bernh.

Mt. Poi, 5000 feet, a single specimen.

PRIOCHIRUS DORLÆ Heller.

Mt. Penrissen, 4000 feet, a single specimen.

PRIOCHIRUS (TRICANTHOCHIRUS) ACCESSORIUS n. sp.

Black, shining subdepressed. Head with 3 large teeth in front, the middle one distinctly longer than the lateral, spigot-shaped; at the inner side of the base of the lateral teeth with a small acute denticle, visible from above; frontal impression not twice as broad as long, vertex sulcate. Thorax transverse, the sides moderately closely punctured throughout except for a narrow space adjacent to the lateral margin; base not completely margined. Elytra distinctly longer than the thorax. Abdomen closely and rather strongly punctured, only the middle line impunctate. Antennæ ferruginous, the 1st joint emarginate, 3rd longer than 2nd, 4th moniliform, 5th to 10th transverse. Legs ferruginous. Length 7 mm.

General aspect of *P. tridens* Motsch., but differs in the longer spigot-shaped median tooth, longer, less stout, lateral teeth and narrow frontal impression; the abdominal puncturation is very simliar to that of *P. modigliani puncturatis* Bernh.; the antennæ scarcely differ form those of *P. tridens*.

Mt. Penrissen, 4000 feet, 3 specimens.

PRIOCHIRUS (CEPHALOMERUS) DIVARICATUS Cam.

Mt. Penrissen, 8 specimens.

In some of this series the inner frontal horns are practically parallel and not divergent as in the type.

PRIOCHIRUS (SYNCAMPSOCHIRUS) BRUNNEIPENNIS n. sp.

Black shining, elytra and abdomen brown with ferruginous apex. Frontal impression rather long, not twice as broad as long, depressed at the converging sides and elevated in the centre, the frontal margin or either side with a short, stout tooth much shorter than the side of the impression, in the middle very slightly crescentically emarginate: vertex medially sulcate. Antennæ with 1st joint emarginate at apex, 2nd shorter than 3rd, 4th and 5th moniliform, 6th to 10th transverse. Thorax strongly transverse, the sides parallel with 4 or 5 punctures, base completely bordered. Elytra half as long again as the thorax, longer than broad, with a few superficial punctures on the disc. Abdomen irregularly sculptured with larger and smaller punctures more or less confluent, coriaceous, with sparing coarse yellow pubescence. Legs ferruginous. Length 7.5 mm.

Very distinct from the four others of this subgenus by the absence on any accessory tooth at the side or below the frontal teeth.

Mt. Penrissen, 4000 feet, 2 specimens.

HOLOSUS PARCESTRIATUS Fauv.

Mt. Penrissen, 7 specimens.

LISPINUS IMPRESSICOLLIS Motsch.

. Mt. Penrissen, 6 specimens.

LISPINUS SUBCORIACEUS Cam.

Mt. Penrissen, 3 specimens.

TETRAPLEURUS FUSCIPENNIS n. sp.

Nearly opaque, dull ferruginous-red, the head except the front and the elytra except the extreme base, pitchy-black. Antennæ ferruginous. Legs reddish-testaceous. Length 2 mm.

Distinct from all the known species by the colour. Head narrower than the thorax, the eyes large and prominent occupying the whole of the side of the head up to the constriction of the neck; rather coarsely, closely and rugosely punctured, in front rather less coarsely, the antennæ tubercles shining and impunctate. Antennæ with 2nd joint short and stout, the 3rd a little longer and more slender, 4th and 5th subquadrate, as long as broad, 6th moniliform, 7th to 10th transverse, gradually increasing in width, the 10th fully twice as broad as long, 11th stout, conical. Thorax distinctly transverse, the sides very slightly rounded and finely denticulate in front, the posterior third almost straightly narrowed to the rounded posterior angles; the disc in front feebly longitudinally impressed, posteriorly with a deep transverse impression connected on either side with a large, deep, opaque impunctate impression adjacent to the posterior third of the sides and in front of this with a shallower oval fovea; sculpture very similar to that of the head. Elytra broader and longer than the thorax, longer than broad, the disc of each with 4 longitudinal keels, the external one very obsolete, more visible behind, the 1st (sutural) connected in a curve with the 3rd behind the 2nd and shorter keel, the whole surface covered with irregular rugose, more or less longitudinally confluent and somewhat superficial sculpture.

Abdomen coriaceous, scarcely punctured.

Mt. Penrissen, 4000 feet, a single specimen.

OXYTELOPSIS? GENALIS Fauv.

Mt. Penrissen, 4000 feet, one specimen.

OXYTELOPSIS BORNEENSIS n. sp.

Ferruginous: head large, quadrate, opaque; coarsely, closely sculptured, the front shining, simply punctate. Thorax almost semicircular, the anterior angles prominent, rounded, the sides feebly bisinuate, and finely denticulate, the disc longitudinally 3-sulcate, coarsely and closely sculptured.

Elytra broader and longer than the thorax, transverse, coarsely asperate. Abdomen coriaceous, finely and moderately closely punctured. Antennæ and legs testaceous. Length 2.75 mm. Colour of *O. pseudopsira* Fauv., with similarly formed antennæ, but differs in large quadrate head and longer temples, longer thorax and weaker impressions.

Mt. Poi, a single specimen.

OXYTELUS GRANADILLÆ Cam.

Mt. Poi (foot), a single specimen.

HOLOTROCHUS GLABERRIMUS n. sp.

Black, shining; the anterior part of the head, the anterior angles and side margins of the thorax, the posterior margins of the first four abdominal segments very narrowly and whole of the 5th to 6th segments rufo-testaceous. Antennæ and legs reddish-testaceous. Length 4 mm. (in well extended specimen). Head black, shining, in front of the level of the eyes reddish-testaceous and infuscate in the middle, the disc posteriorly with a very few fine punctures, otherwise impunctate. Antennæ with the 2nd joint shorter than the 3rd, 4th a little longer than broad, 5th and 6th scarcely longer than broad, 7th to 10th transverse. Thorax transverse, widest at the level of the first and second fourths, the sides in front slightly rounded, nearly straight or narrowed behind, the disc with a few fine scattered punctures, the sides with two setiferous punctures, in the middle with an extremely fine, scarcely perceptible impressed line. Scutellum with 10th and 11th finely punctured. Elytra as wide as and a little longer than the thorax, as long as broad, sutural stria fine, evanescent behind, the sides with 5 or 6 very fine setiferous punctures, otherwise impunctate. Abdomen very sparingly, superficially and finely punctured, the sides with a few setæ, the bases of the anterior segments feebly coriaceous.

Mt. Poi, (foot), a single specimen.

HOLOTROCHUS CORIACEIPENNIS n. sp.

Cylindrical, black; the posterior angles of the thorax, the apical of the elytra and posterior margins of the abdominal segments very narrowly ferruginous; elytra less shining than the fore-parts, impunctate and strongly coriaceous. Antennæ

ferruginous. Legs reddish-testaceous. Length 6.5 mm. Head shining, moderately finely and moderately closely punctured, the temples impunctate but strongly coriaceous. Antennæ with the 2nd and 3rd joints of equal length, 4th and 5th as long as broad, 6th to 10th transverse, 8th to 11th almost forming a club. Thorax transverse, the anterior angles rounded, the sides in front feebly rounded, behind almost straightly narrowed to the rounded posterior angles which are explanate, disc with a narrow impunctate line, the rest of the surface about as closely but more coarsely punctured than the head, in front of the posterior angles rather obscurely impressed. Scutellum coriaceous with a few fine superficial punctures. Elytra as broad as but a little longer than the thorax, scarcely transverse, impressed at the shoulders, less shining than the fore-parts, impunctate, strongly coriaceous somewhat obsoletely longitudinally strigose. Abdomen with the first four segments strongly coriaceous and very sparingly punctured, the 5th and 6th much less coriaceous, superficially and moderately closely punctured.

Mt. Poi, 5000 feet, 3 specimens.

OSORIUS BICORNIS Cam.

Mt. Penrissen and Mt. Poi, 5 specimens.

OSORIUS GIGANTULUS n. sp.

Black, shining, the sides of the thorax and posterior angles reddish-translucent; apex of abdomen reddish. Head very coarsely punctured, Antennæ and legs reddish-brown. Length 11 mm.

Allied to *O. robustus* Cam., the shape of the thorax being very similar, but the sculpture of the head is entirely different. Front of head bisinuate, the angles distinctly produced and bluntly rounded, the front in the middle, the vertex and antennal tubercles smooth, the sides of the front and the sides of the vertex covered with very large superficial punctures, the supra-ocular region striate, the striæ widely separated, the base with close, coarse, more or less transverse irregular punctures. Antennæ with 3rd joint much longer than 2nd, 4th to 10 oval, gradually decreasing in length. Thorax transverse, widest about the middle, the anterior angles prominent, the sides broadly feebly sinuate just behind, then gently rounded to

the rounded, upturned and rather broadly explanate posterior angles and obscurely crenulate; disc in the middle with broad impunctate space, the rest of the surface covered with large irregular, superficial punctures, but not so large as those on the head. Elytra as broad as and a little longer than the thorax, slightly transverse, the shoulders with a blunt backwardly directed tooth on the margin; puncturation coarse, superficial and not close. Abdomen very sparingly punctured, more or less coriaceous.

Mt. Penrissen, 4000 feet, 2 specimens.

OSORIUS RUGIFRONS Er.

Mt. Poi, 5000 feet, 2 specimens.

OSORIUS MJOBERGI n. sp.

Black, shining: the vertex, supra-ocular region, temples and front of the head finely, longitudinally, irregularly wrinkled, the anterior margin truncate and feebly crenulate, the angles rounded; middle of base superficially, irregularly punctured. Thorax rather closely covered with more or less longitudinal variable punctures, at the sides with a few fine longitudinal granules. Antennæ and legs reddish-testaceous. Length 8 mm.

Size and build of *O. diversicollis* Cam., but differing in the following respects: the thorax is more shining and less closely sculptured with distinct more or less longitudinal punctures and has at the sides some small longitudinal granules, whereas in *diversicollis* the very irregular and confluent sculpture gives a retiform appearance; in the present species the distinct longitudinal punctures are in general much less close and much less confluent and there are elongate granules at the sides, the disc is not sulcate and a smooth median space is scarcely apparent; the sculpture of the elytra and abdomen scarcely differs from that of *O. diversicollis*.

Mt. Penrissen. a single specimen.

OSORIUS GRANULICOLLIS n. sp.

Black, shining: head closely strigose, in front the ridges more or less broken and irregular. Thorax with close granular sculpture. Elytra closely and rather finely punctured. Antennæ and legs reddish-testaceous. Length 6.75 mm. Very similar to *O. cribrum* Bernh. in build, but smaller, the

sculpture of the head rather finer, the anterior border without a median denticle; the thorax is of the same build, but the granules are smaller and less close, the puncturation of the elytra and abdomen distinctly finer.

Mt. Poi, 5000 feet, a single specimen.

OSORIUS SPARSIFRONS Cam.

Mt. Penrissen, a single specimen.

PÆDERINÆ.

PINOPHILUS SEPARANDUS n. sp.

Pitchy-black, shining. Thorax as long as broad, the sides almost parallel for the anterior three-fourths. Elytra scarcely as long as the thorax, coarsely punctured; abdomen with the apex ferruginous. Antennæ slender, the first two joints reddish-testaceous, the following testaceous. Legs reddish-testaceous. Length 11 mm. Similar to *P. uniformis* Cam., in the build of the thorax, but less shining, with broader less coarsely punctured head and much shorter, more coarsely punctured elytra. Head transverse, subtriangular, temples dentiform; antennal tubercles and a narrow transverse space across the front shining and impunctate except for a row of rather large close punctures immediately behind the anterior margin, the rest of the surface closely and coarsely punctured. Antennæ with the first two joints much thicker than the following, these very slender at the base, club-shaped, all much longer than broad. Thorax as long as broad, the sides practically parallel for the anterior three-fourths, then rounded in continuity with the base; anterior border bisinuate, middle line posteriorly with short, narrow, shining space which is finely sulcate, otherwise closely and rather more coarsely punctured than the head, between the punctures very finely *strigose*. Scutellum with a few large punctures. Elytra much narrower and scarcely as long as the thorax, scarcely transverse, very coarsely and closely punctured and with a very fine ground sculpture. Abdomen rather coarsely and closely punctured, the last two segments ferruginous and much more finely and sparingly punctured; pubescence rather long and coarse.

Mt. Penrissen 4000 feet, a single specimen.

PTINOPHILUS BECCARII Fauv.

Mt. Poi, 5000 feet, a single specimen.

PALAMINUS GERMANUS Cam.

Mt. Penrissen, 4000 feet, a single specimen.

STILICOPSIS OBLIQUA Cam.

Mt. Poi, (foot), a single specimen.

STILICUS INDICUS Cam.

Mt. Poi, six specimens.

STILICODERUS UNICOLOR n. sp.

Black: head and elytra moderately shining, thorax and abdomen more opaque. Antennæ and legs black. Length 8.5 to 10 mm. Larger and more robust than *S. fœæ* Fauv., entirely black with orbicular head, but scarcely differing in sculpture from this species. Head rather shining, orbicular, broader than the thorax, closely, moderately finely punctured. Antennæ with the 3rd joint more than twice as long as 2nd, 4th to 10th all longer than broad, gradually decreasing in length, the last two or three joints somewhat pitchy. Thorax posteriorly and distinctly emarginate before the base, in the middle with a rather broad smooth line throughout, the rest of the surface closely covered with crateriform punctures. Scutellum coriaceous, impressed at base and with a few apical punctures. Elytra about as long as but broader than the thorax, scarcely transverse, coarsely, closely subserially punctured, except near the postero-external angles which are smooth, between the large punctures with fine, moderately close punctures. Abdomen very finely and closely punctured, sericeous.

♂ unknown.

Mt. Poi, 5000 feet, two specimens.

THINOCHARIS BORNEENSIS n. sp.

Subopaque, head black, thorax pitchy, elytra ochraceous the postero-external angles and apical border infuscate. Abdomen with the first two segments fusco-testaceous, the following pitchy. Antennæ fusco-testaceous. Legs testaceous. Length 3 mm. Larger and more robust than *T. carinicollis* Kr., with longer antennæ and thorax and different colouration. Head black, greasy-lustrous, subquadrate, broader than thorax,

the temples very slightly widened, behind the posterior angles rounded, the base slightly emarginate, very finely and very closely punctured. Antennæ with 2nd joint much shorter than 1st, there stout, the following slender, 3rd to 6th subequal, longer than broad, 7th to 10th longer than broad gradually decreasing in length. Thorax a little longer than broad, the sides straight, gradually narrowed behind, middle of disc with fine, smooth, shining line throughout, the rest similarly punctured to the head. Elytra wider and a little longer than the thorax, slightly longer than broad, more shining than the fore-parts, as finely but not so closely punctured as the thorax. Abdomen very finely and closely punctured and pubescent, a little more sparingly behind.

Mt. Poi, 5000 feet, a single specimen.

THINOCHARIS CARINICOLLIS Kr.

Mt. Poi (foot), three specimens.

MEDON MJÖBERGI n. sp.

Entirely black, greasy-lustrous. Head finely and closely punctured, thorax and elytra closely and finely granulate. Antennæ and legs reddish-brown. Length 6 mm. In build, colour and lustre very similar to *M. planatus* Bernh., but the head is a little larger, the puncturation not quite so close, the thorax less narrowed behind with quite different sculpture, the sculpture of the elytra is coarser, that of the abdomen finer and less close and much less pubescent. Head subquadrate, broader than the thorax, the posterior angles rounded, the base truncate, the front broadly, feebly impressed, finely and closely punctured. Antennæ with 3rd joint twice as long as 2nd, 4th to 7th longer than broad gradually decreasing in length, 8th to 10th about as long as broad. Thorax as long as broad, the sides straight, slightly narrowed behind, anterior and posterior angles broadly rounded, in the middle posteriorly with a fine short, sulcate median line, on either side lightly impressed, closely covered with a moderately fine, close, crateriform sculpture. Elytra broader and a good deal longer than the thorax, longer than broad, parallel and similarly sculptured to the thorax. Abdomen closely and finely punctured throughout, finely transversely strigose, finely, moderately closely pubescent.

Mt. Poi, 5000 feet, a single specimen.

MEDON SUBDEPRESSUS n. sp.

Nearly opaque, depressed parallel, the head black, thorax dark brown, elytra reddish-brown, the sides and apical margin narrowly blackish. Abdomen reddish-brown. Antennæ and legs reddish-testaceous. Length 4.5 mm. Head black, subquadrate, broader than the thorax, the temples a little widened behind, the posterior angles rounded, the base slightly emarginate, eyes shorter than the length of the temples, on either side behind the antennal tubercles broadly, shallowly impressed, the whole surface densely and finely punctured. Antennæ reaching a little beyond the base of the elytra, the 2nd joint much shorter than 3rd, 4th to 10th all longer than broad gradually decreasing in length, 11th a little longer than 10th. Thorax dark-brown, greasy-lustrous, obscurely rufescent along the margins, slightly transverse, anterior and posterior angles rounded, the sides almost straight and narrowed behind, in the middle line posteriorly with a fine shining groove, on either side of it rather broadly, feebly impressed, very finely and densely granulate. Elytra a little wider and a little longer than the thorax, about as long as broad, finely and closely asperate. Abdomen very finely and closely punctured and pubescent throughout.

In size lustre and colour very similar to *M. opacellus* Fauv., but flatter, the head smaller, sculpture of the fore part finer and antennæ much longer.

Mt. Poi, (foot), three specimens.

MEDON CINCLIVENTRIS n. sp.

Pitchy-black, moderately shining, the elytra with large reddish-testaceous humeral spot, the first two (visible) dorsal segments fusco-testaceous, the posterior margins of the last two testaceous. Antennæ and legs reddish-testaceous, femora infusate. Length 3.5 mm. About the size and build of *M. aspericollis* Cam.* from Java and similarly coloured, but the head is larger and less transverse and the puncturation is umbilicate, the puncturation of the elytra is much coarser, more or less transversely rugulose, the abdomen more shining and more sparingly punctured. Head broader than the thorax, quadrate, as long as broad the temples parallel, posterior angles rounded, base emarginate, the whole surface covered with moderately large, closely placed umbilicate punctures; the eyes shorter than the temples.

* This name being preoccupied, is changed to *renominatus*.

Antennæ with 2nd and 3rd joints subequal, 4th and 5th scarcely longer than broad, 6th to 10th slightly transverse. Thorax as long as broad, a little narrower behind, the sides straight; disc with very narrow shining median line, sulcate behind and slightly impressed on either side before the base; the surface covered with close and rather fine granules. Elytra broader and longer than the thorax, distinctly longer than broad, parallel, moderately finely, somewhat superficially, not asperately punctured. Abdomen finely, moderately closely punctured.

Mt. Poi, 5000 feet, a single specimen.

MEDON (*LITHOCHARIS*) OCHRACEOUS Gr.

Mt. Poi, three examples.

STAPHYLININÆ.

METOPONCUS NIGER n. sp.

Narrow, elongate, parallel, black moderately shining. Antennæ with the first two joints and apex of the last ferruginous. Legs black, tarsi yellow. Length 5.2 mm. Facies of *M. longiceps* Shp., but narrower and a little smaller, the head and thorax more punctured and the 1st joint of antennæ less dilated. Head much longer than broad, longer and wider than the thorax, the sides quite parallel, the posterior angles rounded, frontal furrows very deep, separated from each other by a prominent well developed keel, the lateral short, superficial, longitudinal, front with raised lines forming a Y, the arms extending to the insertion of the antennæ, the surface moderately finely and moderately closely punctured. Antennæ with the 1st joint dilated towards apex. 2nd scarcely longer than broad, 3rd to 10th transverse, compressed gradually increasing in width, the penultimate about four times broader than long, 11th long, conical. Thorax much longer than broad, narrowed behind on either side of the middle, with two large punctures one at about the level of the first and second thirds, the other about the level of the second and posterior thirds, and occasionally with a few smaller, widely separated punctures. Scutellum bipunctate. Elytra as long as but broader than the thorax, much longer than broad, very sparingly, scarcely perceptibly punctured. Abdomen very sparingly, scarcely perceptibly punctured.

Mt. Penrissen, 4000 feet., two specimens,

LEPTACINUS PARUMPUNCTATUS Gyll.

Mt. Poi (foot), a single specimen.

METOLINUS DISCALIS n. sp.

Black, shining, the elytra testaceous with the base and sides more or less blackish. Antennæ and legs reddish-testaceous. Length 4 mm. Yet smaller than *M. parvus* Cam., differently colored, the head longer, the thorax narrower and the elytra less finely punctured; from *M. exiguus* Kr., it differs in the much smaller and narrower build, different colour of the elytra, much more obsolete ground sculpture of the head and thorax and the clear reddish-testaceous legs. Head quadrate, distinctly longer than broad, broader than the thorax, frontal furrows short, narrow, parallel, the lateral short, longitudinal, ending in a setiferous pore; disc with four punctures placed on either side of it; ground sculpture very fine, transversely strigose. Antennæ with the 3rd to 10th joints transverse, gradually increasing in breadth, the penultimate fully twice as broad as long. Thorax much longer than broad, narrowed behind with four or five fine punctures on either side of the middle line and three or four externally, ground sculpture as on the head. Scutellum bipunctate, transversely strigose. Elytra broader and longer than the thorax, much longer than broad, finely superficially and very sparingly punctured. Abdomen with a few fine punctures at the sides of the segments, transversely strigose and with short, yellow, sparing pubescence.

Mt. Penrissen, 4000 feet, two specimens.

THYREOCEPHALUS BORNEENSIS Bernh.

Mt. Penrissen, 4000 feet, a single specimen.

PHILONTHUS SARAWAKENSIS Bernh.

Mt. Penrissen, 4000 feet, two specimens.

PHILONTHUS LONGICEPS Fauv.

Mt. Poi, (foot), Mt. Poi, 5000 feet, seventeen specimens.

AMICHROTUS SARAWAKENSIS Bernh.

Mt. Penrissen, 4000 feet, one example.

ATANYGNATHUS FUSCUS Kr.

Mt. Penrissen, 4000 feet, one example.

CONOSOMA FLAVOGUTTATUM Cam.

Mt. Poi, four examples.

CONOSOMA GRACILA Kr. (verisim).

Mt. Penrissen, 4000 feet, one example.

COPROPORUS SCAPHOIDES n. sp.

Robust, convex, attenuated behind, black, shining, the anterior and posterior margins of the thorax narrowly, the lateral margins broadly ferruginous; the suture of the elytra and extreme lateral and apical margins ferruginous. Abdomen black, the posterior margins of the segments more or less ferruginous. Antennæ and legs testaceous. Length (in extended examples) 4.5 mm.

A large robust convex boat-shaped species widest about the middle of the elytra and distinctly narrowed behind, of the colour of *C. flavicornis* Kr., but much larger, the antennæ rather shorter, the thorax less narrowed in front with much more distinct ground-sculpture, the elytra and abdomen distinctly more finely punctured, the former with longer lateral impression and more transverse. Head extremely finely and sparingly punctured, with very distinct transversely undulating striæ. Antennæ with 2nd and 3rd joints of equal length, the 4th and 5th scarcely longer than broad, the latter distinctly larger than the preceding, 6th to 10th transverse, gradually increasing in breadth. Thorax strongly transverse, similarly sculptured to the head. Elytra transverse, a little narrowed behind, a little longer than the thorax, very finely and moderately closely punctured much less finely and more closely than the thorax, ground sculpture obsolete except at the base where a few transverse striae are visible, the sides with a broad impression extending nearly to the shoulders. Abdomen strongly pointed, very finely and very sparingly punctured, transversely strigose. ♀: 8th dorsal segment quadrifid, the processes of equal length,

Mt. Poi, two ♀ specimens.

COPROPORUS VARIANS Cam .

Mt. Penrissen, 4000 feet, a single specimen.

List of species retained by the Author.

- 1 *Priochirus accersorius* n.
- 3 ,, *divaricatus*
- 1 ,, *brunneiipennis*
- 1 *Holusus parcestriatus*
- 1 *Lispinus subcoriaceus*
- 1 *Theapleurus fuscipennis* Type
- 1 *Oxytelopsis borneensis* Type
- 1 *Holotrochus glaberrimus* Type
- 1 ,, *coriaceipennis*
- 2 *Osorius bicoruntus*
- 1 ,, *gigantulus*
- 1 *Metoponeus niger*
- 1 *Metolinus discalis*
- 1 *Philonthus sarawakensis*
- 1 *Conosoma flavoguttatum*
- 1 *Coproporus scaphoides*.

XXIX.—New species of Staphylinidae from Borneo. By MALCOLM CAMERON, M.B., R.N., F.E.S.

PART II.

ALEOCHARINÆ.

OUSILUSA BRUNNEA n. sp.

Shining; head black, thorax, elytra and abdomen dark pitchy-brown the posterior margins of the segments lighter. Antennæ black, the first two joints testaceous. Maxillary palpi with 3rd joint black. Legs brown, tarsi testaceous. Length 3.2 mm.

A rather large, robust, dark brown species, much larger and darker than the two species described by me from Singapore, but similar anatomically. Head narrower than thorax, closely covered with rather large umbilicate punctures. Antennæ rather long, gradually thickened towards apex, 2nd and 3rd joints subequal, 4th to 7th longer than broad, gradually decreasing in length and increasing in width, 8th to 10th about as long as broad or slightly transverse, 11th long, conical, a little longer than the two preceding together. Thorax transverse, widest at the middle, the sides rounded and narrowed in front, straighter behind, the posterior angles obtuse, disc with a deep V-shaped impression in the posterior half, arising from a deep fovea in front of the scutellum; sculpture granular, moderately fine, close, sparingly pubescent. Elytra much broader than the thorax, convex, transverse, closely covered with rather coarse pointed granules, much coarser than those of the thorax. Abdomen a little narrowed behind, the first three visible segments each with three transverse rows of fine punctures, one at the base, another behind the middle and other along the margin, otherwise smooth and shining, the 5th finely and irregularly punctured, the 6th finely but much more closely punctured.

♂. 5th (visible) dorsal segment with two small tubercles close together near posterior border. 6th rather broadly emarginate, the emargination with four minute teeth and limited on either side by a larger tooth.

Tutau River, four specimens.

OUSILUSA CRASSICORNIS n. sp.

Near the preceding, but much smaller and narrower, the antennæ shorter and stouter, the 4th to 10th joints distinctly transverse, the 11th nearly as long as the three preceding together; the head less shining, much less coarsely and much more superficially punctured; thorax pitchy-brown, greasy-lustrous, not granulate, but with close superficial umbilicate punctures as on the head; the dorsal impression more U-shaped. The sculpture of the elytra is similar in character but much finer than in the preceding species. Abdomen yellowish-red, finely and sparingly punctured towards the margins of the segments, the bases impunctate. Length 2 mm.

♂. 6th (visible) dorsal segment very feebly emarginate and scarcely perceptibly denticulate. 6th ventral segment produced, narrowed and rounded at apex.

Tutau River, one specimen.

PLAGIUSA BORNEENSIS n. sp.

Subopaque, black, abdomen shining the posterior margins of the segments obscurely rufescent. Antennæ black, the 1st, 2nd and 11th joints reddish-testaceous. Femora dark brown, tibiæ and tarsi reddish-testaceous. Length 3.3 mm.

Very distinct from all the recognised species of this genus by the black colour and large size.

Head subpentagonal, black, subopaque, closely covered with moderately coarse granules; eyes rather prominent. Antennæ long, gradually thickened towards apex, the 2nd joint a little shorter than 3rd, elongate, 4th to 8th all distinctly longer than broad, gradually decreasing in length, the 9th scarcely longer than broad, 10th as long as broad, 11th scarcely as long as the two preceding together. Thorax transverse, widest before the middle, the sides rounded in front, rather strongly, arcuately narrowed behind, the posterior angles slightly obtuse, prominent; base before the scutellum with a small fovea; sculpture as on the head,

Elytra a good deal broader than, but about as long as the thorax, transverse with close and coarser granular sculpture than on the fore-parts except for a space adjacent to the middle of the posterior border which is shining and more sparingly granulate. Abdomen very shining, the bases of the first 3 visible segments a little constricted and strongly transversely impressed, the bases of the first 4 visible segments each with a transverse row of very fine and well separated punctures, 5th and 6th segments with a few fine scattered punctures, very sparingly pubescent.

♂ (?). 8th dorsal segment narrowed and crescentically emarginate.

Mt. Murud, 7000 to 8000, two specimens.

BRACHIDA ROBUSTA n. sp.

Convex, broad, robust, shining rufo-testaceous, the elytra scarcely infusate posteriorly. Antennæ black, the first 3 joints and the last, testaceous. Legs testaceous. Length 3 mm. Very similar in size, build and antennal structure to *B. reyi* Shp., but the elytra are less closely punctured and the abdomen more densely and finely punctured. Head transverse, extremely finely and very sparingly punctured, eyes large, temples short. Antennæ with the first 3 joints slender and elongate, the 3rd a little shorter than 2nd, 4th a little broader, about as long as broad, 5th to 9th stouter, all a little longer than broad, gradually decreasing in length, 10th about as long as broad, 11th elongate, oval. Thorax strongly transverse, widest at the middle, the sides rounded, more narrowed in front, posterior angles rounded, extremely finely and sparingly punctured and with sparse rather coarse yellow pubescence. Elytra scarcely as long as but wider than the thorax, transverse, closely, finely subasperately punctured and with pubescence as on thorax. Abdomen a little narrowed behind, finely and closely punctured and pubescent throughout.

Sungei Tutau, with Ants, one specimen.

(?) *GYROPHÆNA* (s. str.) *metallescens* n. sp.

Shining bronze-black, elytra testaceous (with brassy reflex in certain lights), the postero-external angles more or less infusate. Abdomen black, the first two visible segments clear yellow. Antennæ long, black, the first 3 joints testaceous. Legs testaceous. Length 3 mm. I place this

insect somewhat doubtfully in *Gyrophæna*, the tarsi and mouth parts (so far as can be seen without dissection) appertain to this genus as also the form of the head; the thorax, however, is very like in build that of *Euypeta labilis* Er., but rather more transverse, and so does not conform to the type found in this genus. Head strongly transverse, retracted behind the eyes, with 4 or 5 small punctures before the base, otherwise impunctate. Antennæ with the 3rd joint shorter and more slender than 2nd, 4th small, transverse, 5th to 10th all distinctly longer than broad, gradually decreasing in length, 11th conical, longer than 10th. Thorax slightly transverse, the sides rounded in front almost straight behind, disc with a row of 4 fine punctures on either side and a much larger one near the base externally, the sides with 2 or 3 fine punctures, otherwise without sculpture. Elytra scarcely longer but broader than the thorax, transverse, moderately finely and moderately closely, simply punctured, much more finely at the postero-external angles. Abdomen exceedingly finely and exceedingly sparingly punctured, practically impunctate.

Tutau River, a single specimen.

BRACHIDAMORPHA n. gen.

Facies of *Brachida* Muls., labrum transverse, feebly emarginate at the middle of the anterior border, the antero-external angles rounded. Mandibles moderate, lightly curved, pointed, the right with 3, the left with one small sharp tooth. Maxillary palpi with 1st joint small, 2nd elongate, curved, slightly thickened towards apex, 3rd short, oval, shorter but much thicker than the preceding, 4th small, subulate.

Inner lobe of maxilla strongly curved at apex, pointed, with 5 or 6 moderately long spines towards the base, ciliate proximally. Tongue narrow and elongate, extending to the level of the apex of the 2nd joint of the labial palpi. Slightly widened in front and split nearly to the middle. Labial palpi distinctly 3-jointed, 1st joint short and stout, very little longer than broad, the 2nd much narrower and much shorter than the 1st, a little longer than broad, 3rd a little narrower and twice as long as 2nd. Paraglossæ feeble, extending to the apex of the 1st joint of the labial palpi. Temples finely bordered below. Prothoracic epipleuræ not visible when viewed laterally. Mesosternal process acute, extending two-

thirds the length of the coxæ and meeting the acute metasternal process. Intermediate coxæ narrowly separated. Tarsi 4, 4, 5. The anterior pair with first 3 joints very short, subequal, 4th longer than the preceding together. Intermediate similar to the first, but a little longer. Posterior with the first 4 joints gradually decreasing in length, the 1st not as long as 2nd and 3rd together. Tibiæ finely ciliate. Elytra not sinuate at the postero-external angles. Antennæ thickened from the 4th joint. Type *rufescens*.

BRACHIDAMORPHA RUFESCENS n. sp.

Moderately shining, widest at the middle, narrowed in front and behind; head and thorax reddish-testaceous, elytra and abdomen pitchy brown, the former obscurely reddish at the shoulders. Length 1.75 mm. Head transverse, much narrower than the thorax, finely, moderately closely punctured and finely pubescent. Antennæ with the 1st and 2nd joints stouter than the following, the 3rd shorter and more slender than 2nd, 4th very small, transverse, 5th to 10th transverse, gradually increasing in breadth and forming a club, the penultimate joints more than twice as broad as long. Thorax strongly transverse the sides evenly rounded, narrower in front than behind, posterior angles rounded, rather more finely and more superficially punctured than the head.

Elytra longer and wider than the thorax, transverse, very finely and closely punctured, more finely than the fore-parts. Abdomen gradually narrowed from base to apex, very finely and rather closely punctured and pubescent throughout.

Mt. Dulit, 3000 feet, three specimens.

AMAURODERA SIMILIS n. sp.

Extremely like the ♀ *A. bomfordi* Epp., in colour and build differing only in the following respects: the smaller size (4 mm.) antennæ with joints 4 to 9 black, head more broadly rounded behind the eyes and so less attenuated, the thorax with much deeper and more distinct sulcus through nearly the whole length, the apices of the femora darker.

Mt. Dulit, 3500 feet, a single specimen.

FALAGRIA (s. str.) MONTICOLA n. sp.

Very similar to *F. dimidiata* Motsch., of similar colour and lustre, but larger, the temples completely coarctate with base, more sparingly and obsoletely punctured, the antennæ distinctly longer but similarly constructed, the individual joints longer, the thorax not at all flattened in the middle in front so that the sulcus does not appear to open out, and more obsoletely punctured, elytra rather less closely punctured. Length 3.5 mm.

Mt. Dulit, 3500 feet, three specimens.

TACHYUSA ASPERATA N. SP.

Subopaque, pitchy, densely, finely sculptured and pubescent throughout. Abdomen scarcely constricted at the base. Scutellum, base and apical margins of the elytra testaceous-yellow. Antennæ pitchy, the first 3 joints and the last, testaceous. Femora pitchy, the tibiæ and tarsi testaceous. Length 2.75 mm. Very similar in build to *T. scitula* Er., but more opaque, and differently coloured and sculptured.

Head black, closely and finely granulate, finely pubescent. Antennæ rather long, slender, all the joints longer than broad, the third longer than 2nd. Thorax scarcely transverse, rounded in front, widest a little behind the anterior angles, more strongly narrowed and feebly arcuate behind, posterior angles obtuse; before the scutellum with a small fovea; similarly sculptured to the head. Elytra broader but as long as the thorax, slightly transverse, equally densely but more finely sculptured than the fore parts, finely pubescent. Abdomen with the first 2 segments transversely impressed, very finely and very closely punctured and pubescent throughout, scarcely more sparingly behind.

Mt. Dulit, 3000 feet, a single specimen.

ATHETA (ACROTONA) MJÖBERGI n. sp.

Pitchy, moderately shining, elytra and abdomen brownish-testaceous the former a little infuscate at the base. Antennæ with the first 3 joints testaceous. Legs testaceous. Length 2 mm.

A narrow fragile species with the facies of *Oxygoda exigua* Er. Head black, very finely, closely, asperately sculptured.

Antennæ slender, the 3rd joint as long as 2nd, 4th and 5th scarcely longer than broad, 6th to 10th slightly transverse not increasing in width, 11th broader and about as long as the two preceding together. Thorax transverse, widest at the level of the middle and posterior thirds, the sides rounded and narrowed anteriorly, less so behind, the posterior angles rounded, the whole surface covered with fine, close, granular sculpture, distinctly and finely pubescent. Elytra as long as but slightly broader than the thorax, transverse, very similarly sculptured to the thorax, finely pubescent. Abdomen gradually narrowed from base to apex, extremely finely and closely punctured, a little more sparingly behind, finely and closely pubescent.

Sungei Serambo, one specimen.

ASTILBUS BORNEENSIS n. sp.

Black, shining, the head thorax and elytra with distinct metallic-bronze reflex.

Antennæ with the first 2 joints reddish-testaceous. Legs reddish-testaceous, the apex of the femora narrowly infusate. Length 5.2 mm. Build of *A. levicauda* Bernh., but much larger, more robust and differently coloured. Head transverse, with the large eyes as broad as the thorax, finely, superficially and moderately closely punctured. Antennæ with 3rd joint distinctly longer than 2nd, 4th slightly longer than broad, 5th to 10th transverse gradually increasing in breadth, 11th oval oblong, longer than 9th and 10th together. Thorax scarcely broader than long, the sides sinuately narrowed behind, rounded and less narrowed in front, the posterior angles obtuse, in front of the scutellum with a fovea continued as a distinct median groove nearly to the anterior margin, posterior half of the disc also broadly impressed, puncturation closer, less fine and less superficial than that of the head, distinctly pubescent. Elytra broader but scarcely as long as the thorax, closely and less finely punctured, finely pubescent. Abdomen shining, practically impunctate and glabrous.

♂. 8th dorsal segment crescentically excised in the middle of the posterior margin and furnished with 3 or 4 moderate crenulations, the rest of the margin finely and closely crenulate, on either side with a small tooth externally.

Mt. Murud, five specimens.

ASTILBUS VELUTICOLLIS n. sp.

Head black, shining, thorax pitchy-brown, opaque densely punctured; elytra pitchy-black, shining; abdomen shining, reddish-testaceous, more or less infusate along the middle line, the 5th (visible) segment pitchy. Antennæ with 2nd and 11th joints testaceous, the rest more or less infusate. Legs testaceous. Length 3 mm. Head transversely subquadrate, with the large eyes as broad as the thorax, very finely and very sparingly punctured. Antennæ with 3rd joint longer than 2nd, the following all much longer than broad, 11th nearly twice as long as 10th.

Thorax distinctly transverse, widest behind the anterior angles, distinctly sinuate and narrowed behind, the posterior angles a little prominent and rounded, very closely and moderately finely punctured. Elytra considerably broader but along the suture about as long as the thorax, transverse, very finely but not very closely punctured and pubescent. Abdomen narrowed behind, the sides strongly elevated, practically impunctate.

♂. 7th dorsal segment deeply, coarsely and closely punctured; 8th distinctly crenulate along the posterior margin.

Mt. Dulit, 3500 feet above sea, a single specimen.

ASTILBUS STRIGICOLLIS n. sp.

Shining pitchy-black; elytra pitchy-brown; abdomen with the anterior margins of the first 2 (visible) segments rather broadly, the posterior narrowly, testaceous. Antennæ testaceous, the intermediate joints more or less infusate. Legs pitchy, femora at base and the tarsi testaceous. Length 3.2 mm.

Head transverse, a little narrower than the thorax, the eyes large, temples short, coarctate with the base, almost impunctate. Antennæ rather long, scarcely thickened towards apex, the 3rd joint longer than 2nd, 4th to 10th all distinctly longer than broad, gradually decreasing in length, 11th longer than 10th. Thorax longer than broad, convex, the sides narrowed and sinuate before the obtuse posterior angles, rounded in front, widest at the level of the 1st and 2nd thirds, before the scutellum with a deep, shining fovea, the rest of the surface except the extreme margins rather coarsely, closely, longitudinally strigose, the ridges more or less interrupted.

Elytra shorter and broader than the thorax, transverse, closely covered with short longitudinal granules, except at the posterior margin and epipleuræ which are without sculpture. Abdomen with a few setiferous punctures along the posterior margins of the segments otherwise without sculpture or pubescence.

Mt. Dulit, 3500 feet above the sea, a single specimen.

MYRMEDONIA BORNEENSIS n. sp.

Very shining; head black; thorax pitchy-brown the sides lighter; elytra pitchy, the base and disc more or less pitchy-testaceous; abdomen pitchy-testaceous the posterior margins of the segments and the apex more or less testaceous. Antennæ black, the 1st joint pitchy or pitchy-testaceous, 2nd testaceous. Legs testaceous. Length 5 mm.

Of the build of *M. semiflava* Bernh., but larger and more robust, the colour of the abdomen more obscure, the antennæ longer and less stout, the puncturation of the thorax a little finer, that of the elytra finer and more asperate. Head transverse a little narrower than the thorax, black, shining, the middle of the disc impressed, umbonate between the antennal tubercles, very finely, sparingly punctured especially in front, finely shagreened. Antennæ with the 1st joint long and thickened apically, 2nd much shorter, 3rd longer than 2nd, 4th to 6th a little longer than broad, gradually decreasing in length, 7th and 8th about as long as broad, 9th and 10th transverse, 11th as long as the two preceding together. Thorax a little broader than long, widest at the rounded anterior angles, nearly straightly, narrowed behind to the posterior angles which are furnished with a small sharp tooth; middle of the disc broadly and deeply impressed, especially behind, along the sides likewise broadly but less deeply impressed, very finely and very sparingly punctured and without ground sculpture. Elytra scarcely longer but broader than the thorax, scarcely transverse, closely, moderately finely punctured. Abdomen practically impunctate on the disc, very finely transversely strigose.

♂. 7th dorsal segment in the middle with a transverse row of 4 minute granules; before the posterior border with 4 small granules, of which the median pair are occasionally united to form a larger tubercle. 8th dorsal segment crescent-

tically excised from side to side, the margin scarcely visibly crenulate.

? district.

LEUCOCRASPEDUM ROBUSTUM n. sp.

Robust, shining, convex, rufo-ferruginous, the margins of the abdominal segments and apex testaceous. Antennæ and legs testaceous. Length 2.5 mm.

From the description would appear to be near *L. rufum* Fauv., but smaller, with shorter antennæ, the 8th to 10th joints being slightly transverse. The thorax is very finely and closely punctured and with a fine yellow pubescence; the elytra transverse, narrowed behind, less finely punctured than the thorax, and similarly pubescent, the abdomen is strongly pointed, closely and finely punctured and pubescent throughout, the sides with long black setæ.

Mt. Dulit, 3500 feet, a single specimen.

PSEUDOPLANDRIA RUFICOLLIS n. sp.

Shining, head black or more or less rufescent; thorax entirely, base of elytra more or less broadly red, posteriorly infuscate; abdomen pitchy-black, the 1st (visible) segment more or less, the posterior and side margins of the following reddish-testaceous. Antennæ blackish, the first 3 joints testaceous. Legs testaceous. Length 2.4 mm. A little more robust in build than *P. (Hoplantaria) frugivora* Cam., with longer antennæ, different colour and much finer and more sparing puncturation. Head transverse, eyes large, extremely finely and extremely sparingly punctured. Antennæ rather stout, 2nd and 3rd joints of equal length, 4th and 5th slightly longer than broad, 6th to 8th as long as broad, 9th and 10th transverse, 11th conical as long as the two preceding together. Thorax distinctly transverse the sides evenly rounded, the disc with 4 quadrately placed punctures, otherwise impunctate and glabrous. Elytra a little longer and broader than the thorax, slightly transverse, very finely, but not closely punctured, pubescence yellow, sparing. Abdomen with the posterior margins of the segments with some very fine punctures arranged transversely in 2 rows, otherwise practically impunctate, pubescence very scanty, yellow.

Mt. Dulit, 3500 feet, two specimens.

XXX.—New species of Staphylinidae from Borneo. By MALCOLM CAMERON, M.B., R.N., F.E.S.

OXYTELINAE.

EUPIESTUS BORNEENSIS n. sp.

Opaque pitchy black; thorax with six sharp parallel keels, the median pair interrupted by a deep transverse impression across the middle. Antennæ and legs ferruginous. Length 2.3 mm.

Smaller than *E. sculpicollis* Kr., and opaque, the head more rounded and less triangular, the thoracic keels parallel, not at all united; from *E. ocularis* Fauv., which it resembles in colour and opacity it differs in the much smaller size, shorter less robust antennæ, sharper thoracic keels, median impression shorter and transverse. Head subtriangular, narrower than the thorax, eyes not prominent, postocular area rounded, anterior margin rounded, front on either side deeply and broadly impressed, the space between umbonate, shining, finely and sparingly punctured; antennal tubercles well developed, shining, vertex deeply and broadly sulcate, opaque moderately finely and closely punctured, sulcate on either side above the eyes: antennæ with the 1st joint stout, 2nd--3rd of equal length, 4th scarcely, 5th to 10th distinctly transverse, not increasing in breadth after the 7th; 11th conical. Thorax transverse, the sides parallel for the first two thirds, then strongly contracted, emarginate before the rectangular posterior angles, the disc with six well defined, sharp, parallel keels of which the central pair are interrupted by a transverse depression about the middle, puncturation moderately coarse and close. Elytra a little broader than the thorax, square, each with four parallel keels, sutural, humeral

and two discal, the external interspace with two rows of large punctures, the others with one row. Abdomen coriaceous, moderately coarsely and closely punctured at the bases of the anterior segments. The whole insect appears to be covered with a secretion which obscures the sculpture.

Tutau River, a single specimen. In my collection.

ELEUSIS MJÖBERGI n. sp.

Entirely black. Very shining, very finely and very sparingly punctured, ground sculpture very fine: head in both sexes large, orbicular; thorax broadly depressed on the disc, finely carinate medially, lateral denticle very small; elytra a little longer than the thorax: antennæ slender, the penultimate joints as long as broad and reddish-brown, the 1st joint brown; femora brown, tibiæ-tarsi testaceous.

Length 2.75 to 3 mm.

Very near *E. pusilla* Kr., but (at least in well-coloured examples) black, more shining, the ground sculpture much less distinct, shorter elytra and longer, more slender antennæ and smaller eyes. Head large in ♂, larger orbicular, wider than the thorax, juxta-ocular sulcus narrow, extremely finely and very sparingly punctured. Very finely strigose: antennæ with the 2nd and 3rd joints of equal length, 4th to 6th a little longer than broad gradually decreasing in length, 7th to 10th stouter, as long as broad. Thorax obconical, the disc broadly impressed in its whole length on either side, very finely but distinctly carinate medially, the keel not extending the whole length, anterior border with a pair of large contiguous punctures on either side, sculpture as on the head. Elytra longer than broad, the sculpture as on the fore-parts: in less well-coloured examples the disc is more or less obscure, pitchy towards the base. Abdomen black, shining, impunctate, transversely strigose.

Tutau River, 5 examples.

BOROLINUS RUFUS n. sp.

Red, shining, apex of the mandibles pitchy. Antennæ black, the 1st joint pitchy-red, sulcate throughout, legs red. Length 15 mm. Very near *B. javanicus* Cast., but differs in the entirely red colour, rather broader build, the much

longer and more slender first joint of the antennæ which is completely sulcate, the shorter frontal horns, larger eyes, more transverse, more parallel-sided thorax.

Mount Dulit, 3500 feet, two specimens.

PRIOCHIRUS (*TRIACANTHOCHIRUS*) *MJÖBERGI* n. sp.

Black, shining depressed; frontal impression twice as broad as long, the teeth equal, pointed, prominent, vertex sulcate. Thorax distinctly transverse, slightly narrower behind, the sides moderately coarsely and moderately closely punctured practically to the lateral margin, base completely bordered. Elytra one-third longer than the thorax. Abdomen very finely biserially punctured, the apex red. Legs red. Length 10.5 mm.

Scarcely differing in the armature and frontal impression from *P. neptunus* Heller, but more depressed, the thorax more transverse, the sides rather more finely punctured, the abdomen more finely punctured, the antennæ a little stouter and the legs entirely red. The antennæ have the 1st joint emarginate at the apex, the 5th to 10th transverse, not increasing much in breadth. The thorax is scarcely alutaceous.

Songei Tutau, two specimens; Mt. Murud, 5000--7000 feet, numerous specimens.

PRIOCHIRUS (*TRIACANTHOCHIRUS*) *CORNEENSIS* n. sp. (Fig. 2.)

Black, shining, depressed; frontal impression $1\frac{1}{2}$ times as broad as long, the median tooth stout and prominent, slightly projecting beyond the level of the lateral teeth. Antennæ with the 1st joint emarginate at apex, the 7th to 10th joints transverse. Thorax transverse a little narrowed in front, feebly alutaceous, the disc sometimes bifurcate, the sides punctured practically up to the lateral margin, the base completely bordered. Elytra about a third longer than the thorax. Abdomen finely, biserially punctured, apex sometimes ferruginous. Legs black. Length 10 mm.

Size and build of *P. neptunus* Heller and with similar antennæ, but with stouter median tooth and the thorax completely margined at the base. From *P. poseidon* Bernh., (Fig. 1) it is distinguished by the narrower frontal impression which is more elevated in the middle and more depressed at the sides.

the teeth less distant from one another, the margin between the middle and lateral teeth more deeply arcuate, only the sides and parts of the base of the thorax distinctly alutaceous, the disc at most with a few feeble alutaceous patches and not uniformly conaceous as in *P. poseidon*.

Mt. Murud, 7000--7200 feet, several specimens.

PRIOCHIRUS (TRICANTHOCHIRUS) DIFFICILIS n. sp.

Black, shining, depressed; median tooth pointed, slightly projecting beyond the level of the lateral. Antennæ with 1st joint emarginate at apex, the penultimate joints slightly transverse. Thorax transverse, slightly narrowed in front, not alutaceous, the sides punctured nearly to the lateral margins, the base completely bordered. Elytra distinctly longer than the thorax. Abdomen finely biserially punctured, apex sometimes red. Legs black. Length 8--9 mm.

About the size and build of *P. dorice* Heller, but the frontal teeth are all shorter, the thorax narrowed in front and completely bordered behind. The antennæ scarcely differ from those of *P. dorice*.

Mt. Murud, 5000--6000 feet, 3 specimens.

PRIOCHIRUS (TRICANTHOCHIRUS) PARVIDENS n. sp.

Black, shining, depressed; the front 3-dentate, the median tooth minute, the lateral very small; frontal impression twice as broad as long, vertex sulcate. Antennæ with the 4th joint scarcely longer than broad, 5th and 6th as long as broad, 7th to 10th transverse. Thorax distinctly transverse, the sides parallel and with a row of small punctures separated by a smooth space from the lateral margin, base not completely margined, disc not alutaceous. Elytra a good deal longer than the thorax, Abdomen finely and sparingly punctured. Legs red. Length 8 mm.

Near *P. subtridens* Heller, but narrower, the median tooth minute, more pointed, the frontal impression shorter and broader, the abdomen less punctured and legs red and sometimes the apex of abdomen.

Mount Murud, 5000--6000 feet, several specimens.

Table of the Bornean species of the sub-genus TRIACANTHOCIRUS BERNH.

- | | | |
|----|---|--------------------------|
| 1. | Antero-external angles of the under surface of the head produced into a process distinctly visible from above. | 2 |
| | The angles not so produced. | 4 |
| 2. | The process long and sharp. | 8 |
| | The process short and blunt; the penultimate joints of the antennæ longer than broad. | <i>moultoni</i> Bernh. |
| 3. | Larger (13-16 mm.) and more convex, sides of thorax more coarsely punctured; penultimate joints of the antennæ moderately transverse. | <i>unicolor</i> Cast—(1) |
| | Smaller (10-11 mm.) and less convex; side of thorax less coarsely punctured; penultimate joints of antennæ strongly transverse. | <i>gutturalis</i> Bernh. |
| 4. | Middle tooth well developed. | 5 |
| | Middle tooth very small. Length 8 mm. | <i>parvidens</i> n. sp. |
| 5. | Legs entirely red. Length 10.5 mm. | <i>mjobergi</i> n. sp. |
| | Legs black. | 6 |
| 6. | Base of thorax completely bordered. | 7 |
| | Base of thorax not completely bordered. Length 10 mm. | <i>doriæ</i> Heller |
| 7. | Disc of thorax very distinctly uniformly alutaceous. Length 11.5-13 mm. | <i>poseidon</i> Bernh. |
| | Disc of thorax not or only feebly alutaceous in patches. | 8 |
| 8. | Thorax feebly irregularly alutaceous. Size larger. Length 10.5 mm. | <i>borneensis</i> n. sp. |
| | Thorax not at all alutaceous. Size smaller. Length 9 mm. | <i>difficilis</i> n. sp. |

PRIOCHIRUS (CEPHALOMERUS) BOROLINOIDES n. sp.

Black, shining, subdepressed; head 4-dentate, the inner long, stout, parallel, conical, considerably produced beyond the level of the apices of the outer, these much smaller, acute, dentiform; frontal impression as long as the sulcus of the vertex—(2) and but little wider than it, longer than the free inner border of the internal horn, inter-cornual border truncate. Thorax very slightly transverse, the sides parallel, moderately coarsely, biserially punctured, the base not completely bordered, feebly alutaceous. Elytra a little longer than the thorax, scarcely alutaceous, the sides with a row of rather close punctures. Abdomen with a row of fine punctures at the base and apex of each segment, except

(1)—Recorded by Fauvel (Mitt. Nat. Hist. Mus. Hamb. xxii, 1904, p. 77.). I have not seen specimens from Borneo.

(2)—Measured from the point where the sulcus begins to widen in this and following species.

medially, apex red. Antennæ black, the 1st joint completely sulcate, the 4th to 8th oval, gradually decreasing in length, the 9th and 10th as long as broad, 11th longer, conical. Legs black. Length 11.5 mm.

Remarkable in the comparatively long, conical inner horns, much produced beyond the level of the small lateral teeth and separated from them by a rounded emargination, the space between the horns semielliptical: viewed laterally these horns are seen to present a minute tubercle below and just behind the apex, whilst nearer the base a much larger denticle is visible. At the base of the external tooth is a small fovea, the head (except for the median sulcus and frontal impression) not otherwise impressed. The sides of the thorax present two rows of punctures the upper one of seven, one at the anterior and two at the posterior angles, with four intermediate, separated by an impunctate space both from the anterior and posterior punctures; the lower row is not interrupted and has numerous punctures.

Mt. Dulit, a single specimen.

Priochirus (*Cephalomerus*) *gazella* n. sp. (Fig. 3.)

Black, shining, subdepressed; head 4—dentate, the inner long, stout, conical parallel, considerably produced beyond the level of the outer teeth, these much smaller, acute, dentiform; frontal impression much wider and distinctly longer than the sulcus of vertex, a little longer than the free inner border of the horn, intercornual margin a little produced. Thorax slightly transverse, the sides parallel, biserially punctured, the base not completely bordered, feebly alutaceous. Elytra distinctly longer than the thorax, scarcely alutaceous, the sides punctured. Abdomen closely, finely and irregularly punctured at the bases and sides of the segments; apex ferruginous. Antennæ black, the 1st joint sulcate throughout, 4th to 6th oval, 7th moniliform, 8th to 10th about as long as broad or slightly transverse. Legs red, tibiæ brown. Length 10 mm.

Readily distinguished from the preceding species by the close, fine irregular puncturation at the bases and sides of the abdominal segments, which obscures the normal biseriate arrangement, and by the red legs; the frontal armature is very similar but the impression is much wider; the upper row of lateral thoracic punctures is not interrupted.

Mt. Dulit, 3,500 feet, four specimens.

PRIOCHIRUS (CEPHALOMERUS) DIVARICATUS n. sp. (Fig. 5.)

Black, subdepressed, shining; head 4—denate, the inner horns long, stout, conical, divergent, considerably produced beyond the level of the lateral teeth, these much smaller, dentiform; frontal impression much wider and a little longer than the sulcus of the vertex, slightly longer than the free inner border of the inner horn, the inter-cornual margin a little produced and rounded. Thorax scarcely transverse, the sides parallel, biserially punctured, the base not completely bordered, in places feebly alutaceous. Elytra a little longer than the thorax, slightly longer than broad, the sides punctured, the disc scarcely alutaceous. Abdomen finely and closely punctured at the sides and bases of the segments; apex red. Antennae black, the 1st joint sulcate throughout, 4th to 6th oval, 7th moniliform, 4th to 10th slightly transverse. Legs red. Length 10 mm.

Distinct from the preceding species by the diverging inner horns and smaller external tooth; viewed laterally the inner horn shows no trace of infra-apical denticle, but a distinct one is present near the base as in the other species.

Mt. Dulit, 3,500 feet, two specimens.

PRIOCHIRUS (CEPHALOMERUS) PROXIMUS n. sp. (Fig. 4.)

Black, shining, subdepressed; head 4—dentate, the inner horns long, stout, conical, scarcely divergent, considerably produced beyond the level of the outer teeth; these well developed, separated from the inner by a semi-circular emargination; frontal impression much wider but shorter than the sulcus of the vertex, as long as the free margin of the inner horn, inter-cornual space a little produced; disc on either side with a large deep fovea between the base of the inner horn and the eye. Thorax scarcely transverse, the sides parallel, biserially punctured, the base incompletely bordered, feebly alutaceous. Elytra a little longer than the thorax, distinctly coriaceous, the sides finely punctured. Abdomen finely and very sparingly biserially punctured, impunctate in the middle line, apex red. Antennae with the 1st joint sulcate throughout, 4th to 6th oval, 7th to 10th as long as broad. Legs red. Length 8.5 to 10 mm. Distinguished from the preceding species by the deeply bifurcate head, shorter scarcely divergent inner horns, larger outer

teeth, strongly coriaceous elytra and the different abdominal puncturation. Viewed laterally the inner horn presents no trace of sub-spiral denticle, but only one near the base.

Mt. Matang, Type (G. E. Bryant), Mt. Dulit, 3,500 feet, (Dr. E. Mjoberg).

PRIOCHIRUS (CEPHALOMERUS) MINOR n. sp.

Mt. Dulit, 3,500 feet, 2 specimens.

Differs only from the preceding by its narrower build, smaller size and the thorax as long as broad. Length 7 mm.

Table of the Bornean species of the sub-genus CEPHALOMERUS BERNH.

- | | | | |
|----|---|----------------------------|---|
| 1. | Head deeply and broadly foveate between the base of the inner horn and the eye; elytra strongly coriaceous. | <i>proximus</i> n. sp. | 2 |
| | Head not foveate; elytra feebly coriaceous. | | 2 |
| 2. | Base and sides of the abdominal segments closely and finely punctured. | | 3 |
| | Base and apex of the abdominal segments each with the usual row of punctures: frontal impression only slightly wider than the sulcus of vertex. Legs black. Size larger, 11.5 mm. | <i>borolinoides</i> n. sp. | |
| 3. | The inner horn viewed laterally with distinct subapical denticle. Elytra moderately coriaceous. | <i>gazella</i> n. sp. | |
| | The inner horn viewed laterally without trace of subapical denticle. Elytra scarcely coriaceous. | | 4 |
| 4. | Size larger 10 mm. | <i>divaricatus</i> n. sp. | |
| | Size smaller 7 mm. | <i>minor</i> n. sp. | |

PRIOCHIRUS (SYNCAMPSOCHIRUS) PARVUS n. sp.

Pitchy brown, shining, subdepressed, elytra black. Head 4—dentate, the teeth equal, small, their apices level, the median further from each other than from the lateral; frontal impression with the sides strongly converging in front, in the middle umbonate, the lateral margins well defined, a little shorter than broad posteriorly, the sides and truncate anterior border much longer than the free margin of the inner teeth; the internal tooth separated from the external by a semicircular emargination and a fovea adjacent, vertex sulcate. Antennæ with the 1st joint emarginate at apex, 4th to 6th moniliform, 7th to 10th transverse, the penultimate rather strongly so, 11th oval. Thorax distinctly transverse, not alutaceous, narrowly sulcate the sides parallel and with

5 or 6 punctures, the base completely margined. Elytra one third longer than the thorax, longer than broad, the sides with 2 or 3 small punctures, not alutaceous. Abdomen moderately finely closely punctured except along the middle. Legs red. Length 6.75 mm.

Mt. Dulit, 3,500 feet, a single specimen.

PRIOCHIRUS (CATACAMPTUS) BIDENS n. sp.

Black, shining, subconvex. Front of head with two short diverging teeth, antero-external angles rounded; frontal impression short and broad, the sides about as long as the free border of the tooth, the anterior margin without trace of denticles; vertex sulcate, near the sides with a feeble oblique impression, the sides parallel, the base coarsely punctured. Antennæ with the 1st joint emarginate at apex, the 3rd scarcely as long as the 4th and 5th together, these and the 6th only slightly longer than broad, the following as long as broad or slightly transverse. Thorax transverse, deeply and broadly sulcate, the sides distinctly narrowed in front, moderately coarsely and closely punctured, the base completely bordered. Elytra one third longer than the thorax, longer than broad, the sides and based with some fine punctures. Abdomen smooth in the middle, finely and sparingly punctured at the sides. Legs black, tarsi testaceous. Length 17 mm.

Build of *P. cilifrons* Heller but larger and without trace of denticle internal to the frontal tooth, the antero-external angles of the head are rounded and not prominent, the sides of the thorax much more thickly punctured and the abdomen more punctured. Viewed from the sides the frontal tooth shows an obscure blunt tubercle subapically. In one example the anterior margin of the frontal impression on either side of the middle line shows a trace of a tubercle.

Mt. Murud, 6,500 feet, 15 specimens.

HOLOSUS TACHINOIDES n. sp.

Black, shining, subconvex, narrowed posteriorly; the legs, posterior margins of the abdominal segments, most of the 5th and the whole of the 6th ferruginous. Antennæ pitchy. Length 4.75. Facies of *H. tachiniformis* Motsch., but puncturation of the head and thorax is much less fine, the

ground sculpture much more distinct, the sides of the latter not angulate, the elytra very finely but distinctly punctured, the abdominal striæ much more distinct and present on the 5th (visible) segment. Head moderately finely and closely punctured, alutaceous. Antennæ with 3rd joint longer than 2nd, 4th to 7th a little longer than broad, decreasing in length, 8th to 10th transverse. Thorax strongly transverse, widest behind, the sides evenly and gently rounded to the rounded anterior angles, without angulation in the middle, posterior angles acute, with a large deep impunctate impression, moderately finely and rather closely punctured, distinctly alutaceous. Elytra longer than the thorax, a little broader than long, the humeral angles prominent, extremely finely and moderately closely punctured, not alutaceous. Abdomen strongly attenuated from base to apex, the oblique striæ much more distinct than in *H. tachiniformis* Motsch. and present on the 5th (visible) segment.

Mt Murud; Tutau River; Kalabit Country; 9 specimens

LISPINUS MJOBERGI n. sp.

Black, shining, subdepressed; thorax transverse, strongly contracted at the base; elytra much longer than broad, the disc of each in the middle with a fovea. Abdomen finely strigose at the sides, the apex pitchy. Antennæ brown. Legs ferruginous. Length 7.5 mm. A large, rather broad parallel species. Head moderately finely, moderately closely punctured, much more sparingly in front, this without impression; antennal tubercle with a small obscure impression internally; ground sculpture scarcely visible. Antennæ with the 3rd joint longer than the 2nd, 4th to 8th a little longer than broad, 9th and 10th fully as long as broad. Thorax transverse, the sides for the anterior two thirds parallel, the posterior one third strongly contracted and sinuate, posterior angles blunt rectangular with a broad deep impression adjacent to the contracted part; median line finely sulcate on either side at the base with an obsolete impression, puncturation of the disc very similar to that of the head, the sides in front exceedingly finely and very sparingly punctured, the lateral impressions superficially punctured; ground sculpture feeble, vermicular. Scutellum moderately closely and superficially punctured.

Elytra much longer than the thorax, much longer than broad, parallel, rather more finely but about as closely punctured on the disc as on the thorax, towards the sides much more finely and more sparingly punctured, disc with a fovea in the middle, ground sculpture obsolete. Abdomen coriaceous at the bases and sides of the segments, superficially and sparingly punctured in the middle, the sides with fine oblique more or less branched striæ on the first four visible segments.

Mt. Dulit, 3,500 feet, 6 specimens.

LISPINUS SUBCORIACEUS n. sp.

Black, moderately shining, strongly coriaceous; thorax superficially impressed on either side at the base, longitudinally foveate against the posterior angles, in front of the fovea with a curved row of three large punctures. Antennæ brown; legs brownish-testaceous. Length 3.5 mm. Near *L. coriaceus* Fauv., but blacker, less depressed, rather less strongly coriaceous, thorax less strongly contracted behind, narrower, the dorsal impressions and foveæ less marked, head narrower and eyes less prominent, puncturation of the thorax and elytra finer.

Tutau River; 2 specimens.

PHOLÆONOUS CASTANEIPENNIS n. sp.

Black, rather shining, the elytra dark castaneous, darker towards the apex, fore-parts moderately coarsely, closely punctured. Antennæ with the 1st joint pitchy, 2nd pitchy at the base, the apex and 3rd, 4th and 5th joints testaceous, the rest black. Legs brownish red. Length 3.4 mm.

Head impunctate in front, transversely strigose, shining, broadly superficially depressed internal to the antennal tubercles, vertex on either side immediately in front of the ocelli with a shining oblique diverging keel and a small plaque between its outer end and the middle line on either side, the rest of the surface moderately coarsely, closely punctured, the interspaces strigose. Antennæ with 3rd joint longer than 2nd, 4th and 5th slightly longer than broad, 6th scarcely, 7th to 10th distinctly transverse, not increasing appreciably in width. Thorax transverse, subconvex, the sides evenly rounded from base to apex, a little narrower at the obtuse

posterior than at the rounded anterior angles, narrowly impressed at the sides for the posterior two-thirds; disc posteriorly near middle line very obsoletely impressed; sculpture as on the head. Elytra broader and fully half as long again as the thorax, the sides parallel, puncturation as on the thorax, but without ground sculpture. Abdomen greasy-lustrous, very finely and rather sparingly punctured, finely coriaceous.

Mt. Murud, 5000 to 6000 feet, 4 specimens.

OSORIUS BIDENS n. sp.

Black, shining; front of head on either side with a moderately long, slender, slightly decurved horn; declivous part of head impunctate, smooth, shining, slightly produced in the middle and impressed; supraocular region striate; vertex smooth in the middle on either side with two or three short feeble striæ and a few fine asperate punctures; occipital region smooth and shining; thorax with a few fine scattered punctures. Antennæ and legs pitchy-brown. Length 11 mm.

Near *O. bicornis* Heller, but larger and more robust, the frontal horns longer and more slender, the antennæ with the penultimate joints longer than broad, elytra more distinctly sculptured, the abdomen less finely and rather more closely punctured. Head on either side with a slender, slightly decurved, pointed horn, the front a little produced in the middle and foveate, impunctate and without ground sculpture; labrum broadly emarginate, transversely strigose, at the anterior margin with a row of small asperate punctures; supra-ocular region shining with a few fine striæ; vertex smooth in the middle and without ground sculpture, on either side with three or four feeble striæ, more or less broken up into elongate punctures; occipital region shining, coriaceous and with a few fine punctures anteriorly. Antennæ rather long, the 3rd joint longer than 2nd, 4th to 10th all distinctly longer than broad, 11th a little longer than 10th. Thorax transverse, the sides very slightly rounded, very feebly emarginate before the rounded posterior angles and moderately broadly impressed adjacent thereto; anterior angles not prominent; disc with a large puncture on either side of the middle, the rest of the surface extremely finely and extremely sparingly punctured and without ground sculpture. Elytra

longer than the thorax, distinctly longer than broad, longitudinally impressed by the scutellum and at the shoulders, finely, very sparingly irregularly punctured. Abdomen moderately finely and moderately closely punctured, coriaceous, pubescence long, yellow, sparing.

Lio Matu, 16 specimens.

OSORIUS BICORNUTUS n. sp.

Differs only from the preceding in the smaller size (7 mm.), testaceous more slender antennæ, the penultimate joints of which are not longer than broad, the fine distinct and close striation of the vertex, less transverse thorax and lighter reddish-testaceous legs. From *O. bicornis* Heller by the distinct striation of the vertex, longer penultimate antennal joints and much more distinctly punctured abdomen.

Baram district, 8 specimens.

OSORIUS BIDENTATUS n. sp.

Very near the preceding but differs as follows: the frontal horns are stouter and rather shorter, the vertex on either side is not striate but presents only a few fine elongate punctures, the antennæ and legs are pitchy black, the penultimate joints of the former slightly transverse. Length 6.5 mm.

Baram district, a single specimen.

OSORIUS PLANIFRONS n. sp.

Black, shining; front of head feebly longitudinally strigose, at the sides sparingly, asperately, punctured; supra-ocular region finely strigose; vertex smooth in the middle, at the sides with some fine interrupted striæ; occipital region finely punctured (especially towards sides), coriaceous. Thorax at the sides in front finely strigose, the rest of the surface very finely and sparingly punctured. Elytra finely, irregularly wrinkled, not punctate. Abdomen finely and sparingly punctured. Antennæ pitchy-testaceous. Legs brownish-red. Length 8.5 mm. Build of *O. rugifrons* Er.; differs in the much less strongly sculptured head, broader and differently sculptured thorax, impunctate elytra and much less punctured abdomen. Head moderately shining, very finely wrinkled and coriaceous on the declivous front, at the sides with a few asperate punctures, between the antennal tubercles scarcely

strigose but irregularly wrinkled; supra-ocular area finely strigose, greasy-lustrous; vertex smooth and shining in the middle, at the sides with a few interrupted striæ; base finely and closely punctured and coriaceous, shining. Antennæ with the 4th to 8th joints longer than broad, 9th and 10th about as long as broad. Thorax a little broader than long, the sides gradually narrowed in a nearly straight line from the prominent anterior to the rounded posterior angles, adjacent to which is a small impression, middle of disc rather broadly smooth, and with an obsolete oblique impression nearer the base on either side of the middle line; base and posterior angles impunctate, the rest of the surface very finely punctured, the punctures somewhat elongate, closer at the sides where by more or less coalescing a few fine striæ are formed. Elytra distinctly longer than broad, finely wrinkled, not coriaceous. Abdomen coriaceous, finely and sparingly punctured with traces of irregular striæ towards the sides.

Baram district, 2 specimens.

OSORIUS DIVERSICOLLIS n. sp.

Black, moderately shining, declivous part of head feebly, irregularly longitudinally strigose, at the sides sparingly, asperately, punctured, supra-ocular region finely, regularly strigose; vertex with fine irregular confluent striæ; occipital region punctured and without ground sculpture. Thorax transverse, sides straight, narrowed behind, with very irregular, confluent superficial impressions giving a vermicular appearance to the sculpture. Elytra coarsely wrinkled, not punctured. Abdomen coriaceous, very finely and sparingly punctured. Abdomen and legs ferruginous. Length 7.8 mm. Head as above described. Antennæ slender, the 9th and 10th joints scarcely longer than broad. Thorax greasy lustrous, with prominent anterior and rounded posterior angles, the sides straightly convergent behind, somewhat obsoletely impressed near the posterior angles, disc narrowly impunctate in the middle line and not coriaceous, sulcate for the anterior third, base impunctate and coriaceous, the rest of the surface curved with very irregular, confluent, superficial impressions. Elytra distinctly longer than broad, coarsely wrinkled, coriaceous only at the base, greasy-lustrous. Abdomen coriaceous, sparingly punctured.

Baram district, a single specimen.

OSORIUS SPARSIFRONS n. sp.

Black, shining, elytra castaneous: declivous part of head not strigose, finely and sparingly asperately punctured, not coriaceous, supra-ocular region extremely finely strigose; vertex at the sides with interrupted striæ, in the middle with a few very fine elongate and ordinary punctures moderately closely placed: base punctured. Thorax transverse, the anterior angles prominent, the sides straightly narrowed to the rounded posterior angles, adjacent to which is a broad, somewhat obsolete impression, finely, not very closely punctured on the disc, more coarsely more closely towards the sides, very shining and not coriaceous. Elytra longer than broad irregularly wrinkled, not coriaceous. Abdomen coriaceous, finely and sparingly punctured. Antennæ reddish-testaceous, all the joints longer than broad, the penultimate only slightly so. Legs ferruginous. Length 7 mm. Similar in build to the preceding, but smaller and more shining, the sculpture of the declivous part of the head is similar to that of *O. frontalis* Fauv., but finer.

Baram district, a single specimen.

OSORIUS ASPERIFRONS n. sp.

Black, moderately shining; front of head rather closely asperately punctured; vertex entirely longitudinally striate, the striæ rather broad, the base impunctate and coriaceous. Thorax scarcely transverse, the sides scarcely rounded anteriorly, feebly emarginate before the rounded posterior angles, the anterior angles not prominent; posterior angles with a small fovea, middle line narrowly impunctate the rest of the surface closely, rather finely asperately punctured. Elytra longer than broad, closely and more coarsely asperately punctured than the thorax. Abdomen rather finely, rather closely punctured, coriaceous. Antennæ with the first two joints reddish testaceous, the rest black, 3rd joint shorter than 2nd, 4th and 5th small, moniliform, 6th to 10 larger, moniliform. Legs pitchy-brown. Length 5 mm. Very similar in size and build to *O. frontalis* Fauv., but the declivous part of head more closely asperate, the vertex distinctly striate, thorax a little narrower, less distinctly emarginate before the posterior angles and the puncturation much denser and asperate both on this and the elytra.

Baram district, a single specimen.

Table of the Bornean species of the genus OSORIUS LATR.

1. Front of head furnished with two horns.	7
Front of head without horns.	2
2. Sculpture of thorax consisting of simple or asperate punctures.	3
Sculpture of thorax consisting of either close more or less elongate granules, or very irregular superficial confluent punctures.	6
3. Puncturation of thorax dense, asperate.	<i>asperifrons</i> n. sp.
Puncturation of thorax simple.	4
4. Abdomen very finely and sparingly punctured, not or very obsoletely striate at the sides.	5
Abdomen more densely punctured, striate.	<i>hewitti</i> Bernh.
5. Front of head in the middle very finely, irregularly longitudinally wrinkled, impunctate, the sides with a few asperate punctures.	<i>planifrons</i> n. sp.
Front of head finely, sparingly, asperately punctured.	<i>sparsifrons</i> n. sp.
6. Sculpture of thorax consisting of short, elongate granules, closely placed. Elytra distinctly punctured.	<i>cribum</i> Bernh.
Sculpture of thorax consisting of very irregular, superficial confluent punctures and giving a vermicular appearance. Elytra wrinkled.	<i>diversicollis</i> n. sp.
7. Penultimate joints of the antennæ distinctly longer than broad. Size larger 11 mm.	<i>bidens</i> n. sp.
Penultimate joints of the antennæ not distinctly longer than broad. Size smaller 6.5 to 7 mm.	8
8. Vertex of head distinctly striate. Legs furruginous.	<i>bicornutus</i> n. sp.
Vertex of head with a few fine punctures. Legs pitchy.	<i>bidentatus</i> n. sp.

PÆDERINÆ.

PINOPHILUS UNIFORMIS n. sp.

Black, shining; apex of abdomen pitchy-red. Head coarsely and closely punctured; thorax with the sides slightly rounded. Antennæ and legs reddish-testaceous. Length 13 mm.

In size and superficially like *P. javanus* Er., but the head is without a transverse impunctate space between the eyes, the thorax is shorter, the sides slightly rounded, the puncturation coarser, the median impunctate line broader and the elytra more coarsely punctured. Head coarsely and closely punctured, except for a smooth triangular space in front, the sides of the latter and the anterior border with some coarse punctures. Antennæ slender the 3rd joint more slender but

of the same length as 2nd, all the joints narrowed at the bases, longer than broad, decreasing in length, the 10th scarcely longer than broad. Thorax as long as broad, the sides slightly rounded, a little narrower behind, the angles rounded; median smooth line extending to the anterior fourth; puncturation coarse and close, but less coarse than that of the head. Elytra a little longer and wider than the thorax, distinctly longer than broad, rather more coarsely punctured than the thorax. Abdomen rather finely and moderately closely punctured and grey pubescent throughout, not iridescent.

Kalabit country, 3000 feet, 2 specimens.

PARAPROCIRRUS BORNEENSIS n. sp.

Pitchy black, scarcely shining, elytra and abdomen pitchy brown. Antennæ with the first two joints reddish-testaceous, the following testaceous. Palpi testaceous. Legs reddish testaceous. Length 9 mm. Differs from *P. miricornis* Fauv. in the colour, the larger size, shape of the head and differently coloured antennæ and palpi. Head broader than the thorax, including the eyes as broad as long; eyes large and prominent, postocular area coarctate with the base, front bordered, broadly shallowly emarginate the whole surface closely, coarsely, umbilicately punctured and with numerous erect yellow hairs. Antennæ with the 3rd joint as long as 2nd, 4th, 5th and 6th a little longer than broad, 7th and 8th as long as broad, 9th and 10th transverse, 11th as long as the 4th to 10th together, bacilliform.

Thorax distinctly longer than broad, widest at the rounded anterior angles, from thence obliquely truncate to the neck, posteriorly straight, gradually narrowed to the rounded posterior angles, the middle line posteriorly with a fine raised shining keel, the rest of the surface similarly punctured to the head but less coarsely, pubescence similar. Elytra a little longer and broader than the thorax, longer than broad, closely, coarsely, rugosely punctured, with long semi-erect yellow pubescence. Abdomen a good deal narrower than the elytra, gradually narrowed behind, the first three segments rather closely and roughly punctured, less roughly more superficially and less closely posteriorly, coriaceous, with long coarse yellow pubescence, 5th and 6th (visible) segments narrowly bordered at the sides.

Mt. Murud, 6000 feet, a single specimen.

PALAMINUS BORNEENSIS n. sp.

Rufo-testaceous, abdomen brown; thorax slightly transverse, coarsely, moderately closely punctured; elytra twice as long as thorax, closely transversely rugosely punctured. Antennæ and legs yellow. Length 5 mm.

Scarcely differing in build and colour from *P. indicus* Kr., but a little larger, the puncturation of the elytra is quite different being distinctly transversely rugose and giving a rougher appearance.

Mt. Dulit, 3,500 feet, a single specimen.

PALAMINUS GERMANUS n. sp.

Rufo-testaceous, abdomen brown; thorax distinctly transverse, coarsely and closely punctured; elytra twice as long as thorax, closely, transversely rugosely punctured. Antennæ and legs yellow. Length 5 mm. Very near the preceding, but the thorax is more transverse and more closely punctured and the puncturation of the elytra finer.

Mt. Murud, 6000 feet, a single specimen.

ASTENUS ALBIPES n. sp.

Black, posterior margin of the elytra very narrowly pale yellow. Antennæ, palpi coxæ and legs pale. Length 5 mm. In build very similar to *A. leptocerus* Epp., but the eyes are larger, the postocular space more nearly parallel; thorax longer and the elytra a little longer and differently coloured. Head longer than broad, the eyes large, the posterior angles broadly rounded, closely umbilicately punctured. Antennæ slender reaching the base of the elytra, all the joints much longer than broad. Thorax longer than broad, widest at the rounded anterior angles and narrowed behind, the sides each with three black setæ, puncturation as on the head. Elytra broader and as long as the thorax, longer than broad, rather coarsely, closely rugosely punctured, finely pubescent. Abdomen moderately coarsely, closely punctured in front, gradually more finely and sparingly behind and with long, greyish pubescence.

Mt. Dulit, a single specimen.

MEDON CRANIATUS n. sp.

Black, depressed, greasy-lustrous, abdomen brown. Head very large as broad as the elytra, densely and finely punctured. Antennæ, mandibles and legs reddish-brown. Length 9.5 mm.

Remarkable by the very large head, small eyes and depressed form. Head as broad as the elytra, quadrate, a little longer than broad, as long as the thorax, the temples nearly parallel, the posterior angles rounded, eyes small, base truncate, disc with fine median raised line, densely and finely punctured and grey pubescent, the sides with a few black setæ. Antennæ with 3rd joint much longer than 2nd, the 4th to 9th all longer than broad, gradually decreasing in length, the 10th as long as broad. Thorax as long as broad, the anterior angles obtuse, the sides gradually narrowed behind to the rounded posterior angles, disc with fine smooth raised line, punctuation and pubescence as on the head, the sides with a few black setæ. Elytra broader and longer than the thorax, distinctly longer than broad, closely finely asperately punctured and finely grey pubescent. Abdomen densely and finely punctured and pubescent on the first five segments, the 6th more sparingly, the posterior borders, sides and apex with long black setæ.

Mt. Murud, 6000 feet, a single specimen.

DOMENE (ENNALAGIUM) BORNEENSE n. sp.

Black, greasy-lustrous; head and thorax densely rugosely punctured. Antennæ and legs brown. Length 6 mm.

From *D. diabolicum* Bernh., would appear to differ in the larger size, longer terminal joints of the antennæ and absence of a shining plaque on the thorax; from *D. indicum* Cam., it differs in the broader, more quadrate head, broader thorax less narrowed behind and with straighter sides, and the rugose punctuation of the head and thorax. Head a little broader than the thorax, a little broader than long, subquadrate, the posterior angles rounded, the vertex in front lightly bi-impressed, punctuation close, fine, rugose, subumbilicate. Antennæ long, the 3rd joint a little longer than 2nd, the rest all distinctly longer than broad, the 11th longer than the 10th. Thorax a little longer than broad, the anterior angles rounded, obliquely truncate to the neck, gradually narrowed behind to the rounded posterior angles, the base lightly bi-impressed

before the scutellum, the posterior half with a very fine smooth line in the middle, the rest of the surface very similarly punctured to the head, the sides setose. Elytra a little broader and distinctly longer than the thorax, a little longer than broad, closely, finely, asperately punctured. Abdomen closely and more finely punctured than the fore parts throughout and closely grey pubescent.

Baram district, a single ♀ specimen.

STAPHYLININÆ.

PACHYCORYNUS BORNEENSIS n. sp. .

Head and abdomen black, the apex and posterior margins of the segments narrowly testaceous; thorax pitchy; elytra fusco-testaceous. Antennæ and legs testaceous. Length 3.3 mm.

Somewhat similar to *L. cribricollis* Fauv., but the head flatter and a little longer, less finely punctured (on the disc), thorax rather narrower and less finely punctured, elytra rather more closely punctured. Head a little longer than broad, depressed, the temples parallel, the posterior angles briefly rounded; frontal grooves well marked, the lateral foveate; temples very finely, moderately closely punctured, middle of disc rather broadly smooth, the rest of the surface moderately coarsely and rather closely punctured and with distinct transversely strigose ground sculpture. Antennæ with the 3rd to 10th joints transverse gradually increasing in breadth. Thorax fully one and half times longer than broad, more finely punctured than the head, on the disc about as closely, with smooth median space and scarcely visible ground sculpture. Elytra a little longer than the thorax, much longer than broad, rather finely, moderately closely, superficially punctured and without ground sculpture. Abdomen very finely and sparingly punctured, finely, transversely strigose.

Mt. Murud, 6000 feet, 2 specimens.

PACHYCORINUS DILATICEPS n. sp.

Black, moderately shining, apex of abdomen reddish-testaceous; head dilated behind the eyes, narrowed in front; elytra longer than broad, finely and closely punctured. Antennæ and legs reddish testaceous, femora more or less blackish along the anterior margins. Length 5.4 to 5.8 mm. Head suborbicular, rather strongly dilated and rounded

behind the eyes (especially in the ♂) and narrowed anteriorly, moderately coarsely and moderately closely umbilicately punctured, the middle and the space between the median frontal furrows smooth, ground sculpture fine and strigose. Antennæ with the 2nd and 3rd joints of equal length, the 4th to 10th transverse. Thorax rather more shining than the head and much narrower, longer than broad, on either side of the smooth median area with a row of ten moderate punctures, towards the sides irregularly punctured, ground sculpture as on the head. Elytra longer and broader than the thorax, finely and rather closely punctured and without ground sculpture. Abdomen finely but more closely punctured than in *P. dimidiatus* Motsch., transversely strigose.

Mt. Murud, 6000 feet.

PACHYCORINUS LATERALIS n. sp.

Black, moderately shining, the sides and posterior margins of the abdominal segments narrowly and whole of the 6th reddish testaceous. Head dilated behind the eyes. Elytra as long as the thorax, closely rather finely punctured. Antennæ and legs reddish-testaceous. Length 4.6 mm. About the size of *P. dimidiatus* Motsch., but the temples are rounded and dilated, the thorax longer and narrower and more strongly punctured, the elytra longer and more closely punctured and the abdomen more punctured; from the preceding species it is distinguished by its smaller size, less dilated head and less finely punctured elytra. Head little longer than broad, the temples slightly rounded and dilated, moderately finely and moderately closely, umbilicately punctured, the middle and inter antennal space smooth, ground sculpture strigose. Thorax long and narrow on either side with a row of nine or ten moderate punctures, externally irregularly punctured. Elytra as long as the thorax, closely and rather finely punctured, but not so finely as in the preceding species. Abdomen finely and moderately closely punctured.

Tutau River, a single specimen.

XANTHOLINUS (S. str.) *NIGROPOLITUS* n. sp.

Black, shining; head quadrate. Thorax with irregular row of seven dorsal punctures. Elytra finely, superficially not closely punctured. Antennæ black, the 1st joint dark brown. Legs reddish-brown. Length 12.5 mm.

A robust species. Head longer than broad, the temples parallel, the posterior angles briefly rounded; median frontal

furrows sinuate, the space between impunctate, longitudinally impressed, the lateral lightly curved; temples impunctate, the rest of the surface moderately finely, somewhat irregularly, not closely punctured, the punctures umbilicate, front of vertex impunctate, ground sculpture exceedingly fine and close, strigose.

Antennæ with the 3rd joint longer than 2nd, 4th to 10th transverse, gradually increasing in breadth. Thorax narrower than head, on either side of the middle with an irregular row of seven punctures, externally with eight or nine others, of which six or seven are more or less grouped antero-externally, along the lateral margin with a further row of six or seven others. Elytra as long as the thorax, longer than broad, more finely punctured than the thorax, the punctures scattered, irregular, finer towards the sides. Abdomen smooth centrally, the sides finely and moderately closely punctured, very finely transversely strigose.

Songei Tutau, a single specimen.

ACTOBIUS VALIDUS n. sp.

Robust, entirely black, shining. Thorax with dorsal row of seven or eight small punctures, externally with a few others, posterior margins of the abdominal segments narrowly, obscurely ferruginous. Antennæ pitchy, the last two joints testaceous. Legs reddish-testaceous the tibiæ infuscate. Length 4.5 mm. A robust entirely black species of the build of *Philonthus sordidus* Gr., but smaller. Head large, quadrate, as long as broad, a little narrower than the thorax, the posterior angles rounded, vertex and front impunctate, the sides with a few small scattered punctures. Antennæ slender, the 2nd joint dilated, shorter than the 3rd, all distinctly longer than broad, gradually decreasing in length, 11th as long as 10th. Thorax a little longer than broad, the sides parallel when viewed from above, on either side of the disc with a row of seven or eight small punctures, externally with a few more irregularly disposed. Scutellum with six or seven punctures. Elytra broader and a little longer than the thorax, a little longer than broad, moderately finely and moderately closely punctured, finely pubescent. Abdomen finely and closely punctured at the bases of the segments, more sparingly elsewhere.

Mt. Murud, 5000 to 6000 feet, a single ♀ specimen.

PHILONTHUS MJÖBERGI n. sp.

Black, shining; thorax with dorsal row of eight punctures on either side, strongly sericeous iridescent: elytra less shining, bronze-black. Abdomen iridescent. Antennæ black, the last joint obscurely testaceous. Legs black, the anterior and middle femora pitchy testaceous. Length 6 mm. In build somewhat similar to *P. peliomerus* Kr., but the thorax rather longer, multipunctate and strongly iridescent, elytra and abdomen more finely and closely punctured, the bases of the anterior segments more closely but not more coarsely punctured than the rest: less robust than *P. sericeicollis* Fauv., the thorax narrower and differently punctured, the elytra longer and more finely punctured, the antennæ longer and more slender. Head subquadrate, about as long as broad, a little narrower than the thorax, the temples shorter than the eyes, slightly convergent behind, the posterior angles rounded, front temples and middle of vertex impunctate, the base and juxta-ocular region moderately finely and moderately closely punctured, without the larger intra-ocular punctures. Antennæ extending to the middle of the elytra, slender, 3rd joint longer than 2nd, 4th to 10th all longer than broad, gradually decreasing in length, scarcely increasing in thickness, 11th longer than 10th. Thorax longer than broad, seen from above the sides nearly straight, slightly narrowed behind, on either side of the middle line with a row of eight moderately fine punctures, externally with four others, one of which is behind the anterior angles, along the lateral margin with six or seven fine punctures. Scutellum very closely and finely punctured. Elytra as long as but wider than the thorax, longer than broad, a little wider behind, finely and rather closely punctured, finely pubescent. Abdomen finely closely punctured and pubescent, a little more sparingly on the last two segments. First joint of posterior tarsi longer than the last.

♂: Anterior tarsi dilated. 6th ventral segment with a small rounded excision of the posterior border.

Baram St, a single ♂ specimen.

TACHYPORINÆ.

CONOSOMA SUBPLAGIATUM n. sp.

Head and thorax black, shining, the posterior angles and posterior border of the latter narrowly and obscurely reddish:

elytra dark reddish-brown, less shining, at the middle of the base with a somewhat quadrate yellow spot : abdomen pitchy-black. Antennæ long and slender, infuscate, the first three and the last testaceous. Legs testaceous. Length 4.3 mm.

Size and general facies of *C. littoreum* L. but the thorax and antennæ longer, the middle joints distinctly longer, the puncturation of the thorax and elytra distinctly less fine. Head extremely finely and moderately closely punctured, finely yellow pubescent. Antennæ long and slender, all the joints much longer than broad, the 11th longer than 10th. Thorax very finely and rather closely punctured, finely yellow pubescent. Elytra as long as the thorax, less shining, slightly transverse, more finely and more closely punctured. Abdomen very, finely and closely punctured, finely grey pubescent with black setæ at sides and apex.

Kalabit country, a single ♀ specimen.

CONOSOMA BASALE n. sp.

Head and thorax shining reddish-yellow, the former blackish behind, the latter on either side of middle at the base with indeterminate black spot : elytra testaceous, the posterior half with the exception of the suture, black, the scutellum and anterior half of the suture narrowly infuscate. Abdomen 1st segment ferruginous, the rest black with the posterior margins of the segments ferruginous. Antennæ with the first three and the last joints testaceous. Legs testaceous. Length 2.5 mm.

Size and general facies of *C. bipunctatum* Gr., but the thorax longer the antennæ longer and more slender, and different colour ; also near *C. suave* Fauv., but more robust, the antennæ longer, the elytra longer and the abdomen differently coloured.

Head scarcely perceptibly punctured. Antennæ with all the joints distinctly longer than broad, gradually decreasing in length, the penultimate not much longer than broad, the 11th longer than 10th. Thorax transverse, finely moderately closely punctured, finely yellow pubescent. Elytra a little longer than the thorax, a little longer than broad, very finely superficially and closely punctured, finely yellow pubescent. Abdomen very finely and rather closely punctured, more shining than the elytra. Very finely pubescent, the sides and apex with long black setæ.

Mt. Murud, 6500 feet, a single ♀ specimen.

CONOSOMA OBSUREGUTTATUM n. sp.

Shining brownish-yellow, the head pitchy behind: elytra each with four black setæ at the side, at the base of each with a small indeterminate pitchy spot, each slightly and indeterminately infuscate about the middle: abdomen with the base of the 3rd (visible) segment and the middle of the 4th black or infuscate. Antennæ testaceous, the 8th and 9th joints black. Legs testaceous. Length 2.8 mm. About the size and general facies of *C. bipunctatum* Gr., but with longer thorax and rather stouter antennæ. Head extremely finely and sparingly punctured. Antennæ short, the 3rd to 5th joints a little longer than broad, gradually decreasing in length, the 6th and 7th about as long as broad, the 8th to 10th distinctly transverse, gradually increasing in breadth, 11th rounded. Thorax slightly transverse, very finely, moderately closely punctured, finely yellow pubescent. Elytra longer than the thorax, distinctly longer than broad, finely more closely punctured than the thorax, finely yellow pubescent, sides with four setæ. Abdomen very finely and moderately closely punctured, the 1st (visible) segment densely yellow pubescent, the rest much more sparingly, the sides and apex with long black setæ.

Mt. Murud, 7000 to 8000 feet, 4 specimens.

TACHINOPORUS n. gen.

In the elongate form and strongly pointed abdomen much resembles a *Bolitoiid*, but the temples and posterior coxæ are not bordered; from *Tachyporus* it differs in the non-subulate 4th joint of the maxillary palpi, from *Tachinus* in the setiferous sides of the elytra and the facies; systematically its position would appear to be adjacent to these genera. Temples not bordered below; gular sutures separated. Tongue broad, bilobed, maxillary palpi with the 3rd joint short, the 4th more than twice as long, the base broad, gradually pointed to the apex. Labial palpi short, three-jointed, 2nd joint shorter than 1st, 3rd longer than 2nd, gradually narrowed and pointed, about as long as the 1st. Thorax almost circular, truncate in front, much wider than the elytra, the epipluræ partly visible when viewed laterally, the sides narrowly margined,

the base emarginate, posternum large, pointed behind, the epimera free, narrow, elongate. Mesosternum not keeled, mesosternal process narrow, acute. Metasternal process narrow, acute, meeting the preceding; intermediate coxæ narrowly separated. Abdomen narrow, elongate, pointed, margined, much narrower than the elytra. Elytra with a row of setiferous punctures on the side margin. Legs rather long; tarsi 5, 5, 5, the anterior short, the first four joints equal; the middle rather long, the 1st joint as long as the 2nd and 3rd together, 3rd and 4th shorter, subequal; the posterior long, the 1st joint longer than the 2nd, 2nd to 4th subequal, 5th as long as 3rd and 4th together. Tibiæ sparingly finely spinose.

TACHINOPORUS BASALIS n. sp.

Very shining, black, the fore-parts glabrous, abdomen slightly iridescent; elytra broadly testaceous at the base. Legs reddish-brown, the intermediate and posterior tibiæ black. Antennæ black, apex of 11th joint testaceous. Length 5.75 mm. Head much narrower than thorax, practically impunctate and glabrous without ground-sculpture; eyes moderate, not prominent, the temples short. Antennæ long, extending to the middle of the elytra, 2nd joint shorter than 3rd, 4th to 11th all much longer than broad and not increasing in thickness, 5th to 11th subequal, 4th a little shorter. Thorax viewed from above nearly orbicular, truncate in front, posterior angles broadly rounded, the anterior briefly rounded, the sides bordered, the base not bordered, middle of disc with fine impressed line except in front, very sparingly, scarcely perceptibly punctured, on the side margins with two or three fine punctures, glabrous and slightly iridescent without ground sculpture. Elytra much narrower and a little longer than the thorax, parallel, longer than broad, testaceous in front, black from the middle of the suture to the posterior third of the sides, the suture in front narrowly black, scutellum black, iridescent, impunctate: elytra with very indistinct fine, superficial and moderately close puncturation, on each side with five long black setæ. Abdomen as long as the foreparts together, narrower than the elytra, gradually pointed behind, finely, not closely punctured throughout, with fine short very sparing pubescence, distinctly transversely strigose, iridescent, the sides and apex with black setæ.

♀. 8th dorsal segment with four equally long spines, the lateral ones stouter: 6th ventral segment with four teeth, the lateral much less produced and separated from the inner by a triangular notch, the middle widely separated from each other by a broad rounded emargination.

Tutau River, 2 ♀ specimens.

TACHINUS FERRUGINEUS n. sp.

Shining ferruginous red, the head posteriorly a little infusate. Antennæ and legs reddish-testaceous. Length 6.75 mm. A broad robust species narrowed behind; broader in front than *T. humeralis* Gr., less parallel, very much more finely punctured and with much longer antennæ. Head very finely and very sparingly punctured, distinctly coriaceous. Antennæ with the 3rd joint a little longer than 2nd, 4th to 10th all longer than broad gradually decreasing in length, the 11th as long as the preceding. Thorax extremely finely and very sparingly punctured, coriaceous. Elytra much longer than the thorax, longer than broad, gradually narrowed behind, sculpture as on the thorax. Abdomen narrowed from base to apex, very finely and very sparingly punctured, finely transversely strigose.

♀. 8th dorsal segment with four long, pointed, equidistant, setiferous processes of which the external are stouter and a little more advanced than the median. 6th ventral segment with six long equidistant setiferous processes, the most external a little stouter than the others.

Mt. Murud, 5000 to 6000 feet, a single ♀ specimen.

TACHINOPROPUS n. gen.

Differs from *Tachinus* in the keeled mesosternum, the longitudinally impressed sides and rounded postero-external angles of the elytra, the elytra epipleuræ not at all visible when viewed laterally and the long 1st joint of the posterior tarsi; from *Coproporus* by the 3rd joint of the maxillary palpi being much shorter than 2nd, and the general facies of *Tachinus*.

TACHINOPROPUS FERRUGINEUS n. sp.

Broad, subdepressed, narrowed posteriorly, moderately shining, ferruginous, the head black, a variable extent of the disc of the elytra posterior black or blackish. Antennæ and

legs reddish-testaceous. Length (in well extended examples) 5 mm. A rather broad subdepressed species with facies of *Tachinus*. Head black, in front rufescent, the vertex with a very fine smooth shining line in the middle, between the bases of the antennæ with a fine transverse shining line, joined by the preceding, the rest of the surface finely, sparingly punctured, glabrous, very distinctly coriaceous; eyes not prominent, semi-circular. Antennæ with the 2nd and 3rd joints of equal length the 4th a little longer than broad narrowed at the base, the 5th much stouter, obconical, 6th scarcely longer than broad, 7th to 10th transverse, gradually increasing in breadth, 11th oval, oblong, nearly as long as the two preceding together. Thorax strongly transverse, widest a little in front of the obtusely rounded posterior angles, the sides margined, evenly rounded and narrowed anteriorly; base not bordered; puncturation and ground sculpture as on the head, glabrous. Elytra a little wider and longer than the thorax, transverse, very little narrower at the base, the sides very slightly rounded, broadly superficially impressed from the shoulder to the posterior third, postero-external angles broadly rounded, puncturation and ground sculpture as on the fore parts. Abdomen narrowed from base to apex, more shining than the fore parts, very finely and sparingly punctured, very finely and sparingly pubescent, ground sculpture very fine, transversely strigose, much less distinct than the fore parts.

♂. 8th dorsal segment in the middle on either side with a short, broad pointed lobe separated from each other by a shallow arched emargination, and from the less advanced postero-external angles by a broad shallow emargination; 5th ventral segment broadly triangularly impressed for the posterior two-thirds in the middle line; 6th broadly triangularly excised in the middle, on either side of the excision with a setiferous tubercle, between this and less advanced postero-external angle, broadly shallowly emarginate, the emargination with a small tooth, the postero-external angle with a long seta.

♀. 8th dorsal segment posteriorly with four long processes, the inner pair narrower and slightly more advanced than the outer; 6th ventral segment with six long processes, the two inner broader, more advanced and separated from each other by a deep oval excision, the apex of each with three spines, the lateral spines subequal and with a seta at the apex of each.

Mt. Dulit, 3500 feet, 4 specimens.

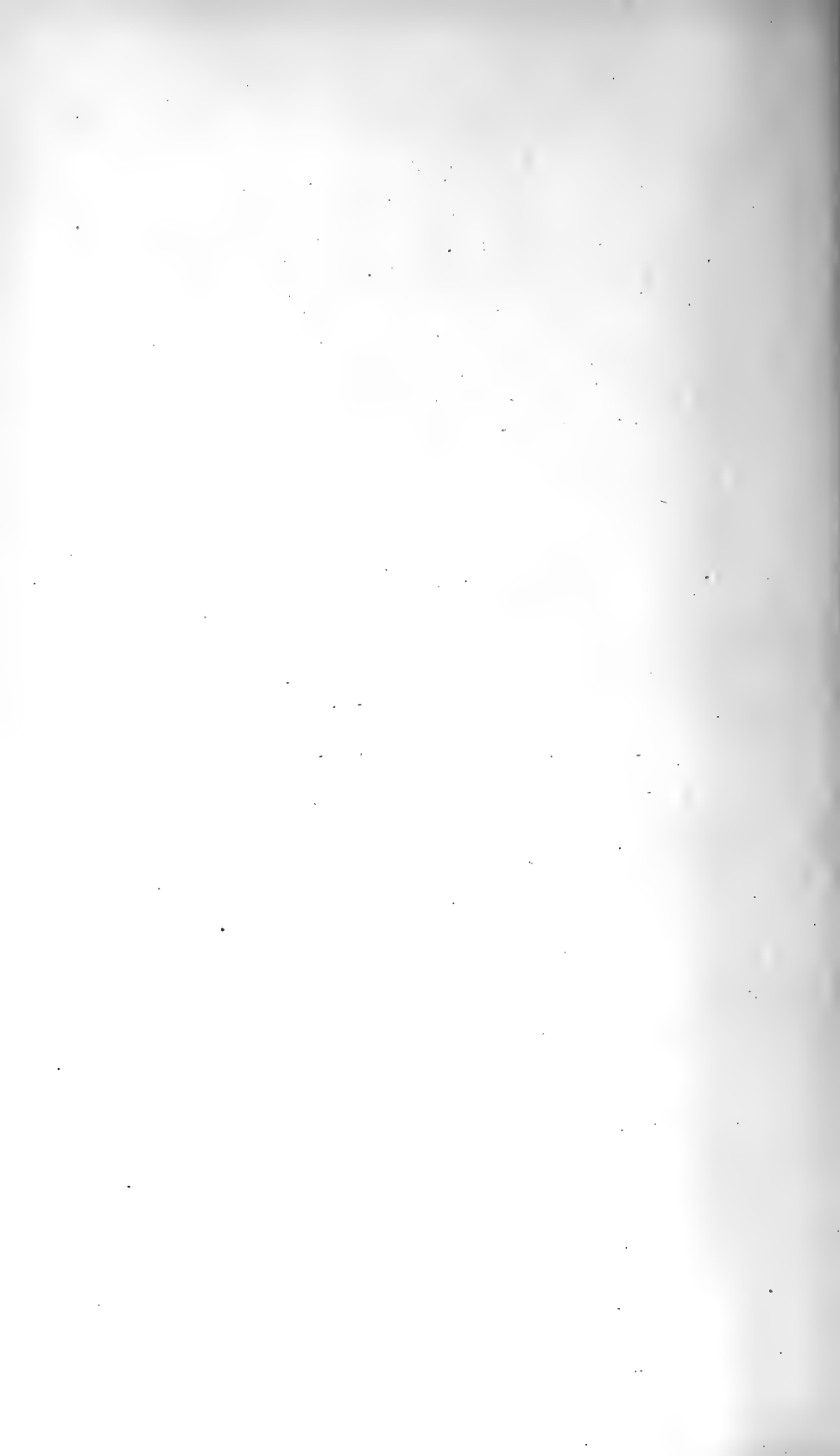
COPROPORUS IRIDESCENS n. sp.

Black, subdepressed, black shining, iridescent, all the margins of the thorax indeterminately ferruginous; elytra with large indeterminate ferruginous patch on the disc extending to the posterior border, lateral margin ferruginous.

Antennæ with the first three joints testaceous. Legs reddish testaceous. Length (in well extended example) 3.5 mm., of the same size and build as *C. discipennis* Fauv., but the elytra mark is less defined and extends up the posterior border, the sides are less narrowly impressed, the lateral margin narrowly explanate, the puncturation of the fore parts is even finer and more sparing, that of the abdomen finer and more obsolete: the whole insect is very distinctly iridescent. Head transverse, much narrower than the thorax, very obsoletely and extremely sparingly punctured, glabrous. Antennæ slender, not much thickened towards the apex, the 3rd joint elongate, longer than 2nd, 4th to 6th longer than broad, gradually decreasing in length 7th to 10th about as long as broad, 11th oval, nearly as long as the two preceding together. Thorax strongly transverse, the sides evenly rounded and narrowed from the base, posterior angles rounded, extremely finely and sparingly punctured. Elytra a little longer but scarcely broader than the thorax, the sides feebly and evenly rounded, slightly transverse, narrowly longitudinally impressed at the sides which are ferruginous and slightly explanate; the base and around the scutellum pitchy, the disc largely ferruginous as above described. Abdomen pointed, black iridescent, closely, finely obsoletely punctured with very short and very sparing pubescence. Mesosternum keeled; 1st joint of posterior tarsi elongate.

♂. 8th dorsal segment with four long lanciform processes of which the outer are stouter than the inner, each with a long seta at apex. 6th ventral segment obliquely truncate at the sides, deeply triangularly excised in the middle, the lateral angles of the excision with a long seta, lateral margins of segment dentiform and with a seta.

Tutau River, 2 specimens.



XXXI.—The Subfamily Steninae, as represented in N. Sarawak. By L. BENICK.

(With one Plate.)

The representatives of the subfamily Steninae of the Staphylinidae seem to be great rarities on the Sunda-Islands, only 15 species being known from there up to now. One belongs, to the subgenus *Stenus*, 9 to the subgenus *Hypostenus* and 5 to the subgenus *Parastenus*.

From Borneo only two species, *St. bispinus* Motsch and *St. sulcipennis* Bck., were hitherto recorded.

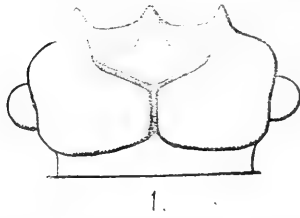
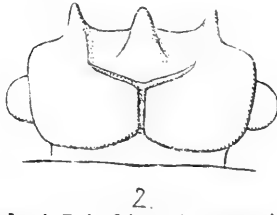
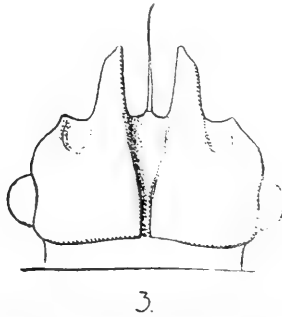
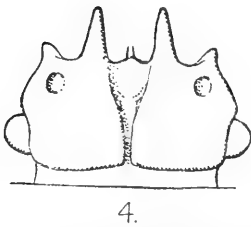
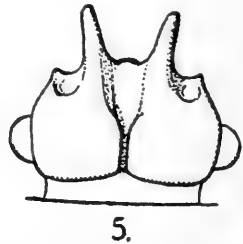
It was therefore much to be appreciated that Dr. E. Mjöberg during his exploration in the northern parts of Sarawak also kept an eye on these rare animals and among his material two species were new. I take the opportunity to describe here also some species found by Dr. E. Mjöberg, in other parts of Borneo and which either were new or up to now not recorded from the island. Also two Sumatra species are recorded. Types deposited in Mr. Benick's collection of Steninae in Naturhistorisches Museum, Liibeck.

1. *STENUS NIGROVIRENS* Fvl.

1 ♀ 4.6 mm. long. Agrees well with the original description—Brastagi, Sumatra 1,600 m. leg. Dr. E. Mjöberg, Distribution : Burma, Sumatra.

2. *STENUS MJÖBERGI* n. sp. (Pl. 14, fig. 3—4.)

Belongs to the *pictus* group and comes nearest to *St. flavidulus* Sh.

Fig. 1. Head of *Priochirus poseidon* Bernh.Fig. 2. Head of *Priochirus borneensis* n. sp.Fig. 3. Head of *Priochirus gazella* n. sp.Fig. 4. Head of *Priochirus proscionus* n.sp.Fig. 5. Head of *Priochirus divaricatus* n. sp.

Yellowish-reddish head, a stripe near the eyes, the three last abdominal segments and a large spot on elytra black; shining, only the anterior parts of head and abdomen, especially the sides of its last segments and the base of elytra with distinct whitish hairs; body otherwise thinly hairy, strongly and roughly punctured.

Head fairly broad, much broader than prothorax and hardly more narrow than elytra, slightly impressed, with two sharp but not very deeply impressed eye furrows, middle part forwards flat, backwards elevated in shape of a stripe-like ridge; punctures fine, deeply impressed and fairly dense, median keel smooth; anterior parts of head light-yellow, densely covered with long white hairs, middle of frons brown, collarparts yellowish. Antennae long and slender, of the two incrassate basal joints the 2nd one is shorter, 3rd joint very slender, about three times and a half as long as the 2nd, 4th and 5th both slightly more than half as long as the 3rd, following joints gradually becoming shorter, the three apical joints slightly infusate; palpi slender, apical joint club-shaped and curved outwards at the tip.

Prothorax narrow, roughly one-fifth longer than broad, laterally dilated, widest behind the middle, constricted backwards, the dorsal parts convex, strongly and densely, but not rugosely punctured.

Elytra square, humeral angles distinctly prominent, sides parallel, at the tips broadly emarginate, convex, along the suture slightly impressed, slightly stronger punctured than the prothorax, the punctures on the disc sometimes confluent. The large macula of the disc leaves forwards a broad, laterally, backwards and along the suture, a narrow surface; at the suture the yellow extends slightly forwards and backwards.

Abdomen of the same width as prothorax, tapering backwards; all segments except the first and fifth are provided with a distinct marginal fold; every segment fairly strongly constricted, finer punctured than the prothorax, the punctures wider apart from each other, and finer and not so deep towards the apex, nearly disappearing on the last segment; the posterior margin of the fifth segment provided with a fold, the posterior margin of the seventh segment with a dorsal emargination in which a fine comb of very densely-placed long teeth can be seen under the microscope.

Legs slender, femora at the base slightly incrassate; first joint of the shorter hind tarsi nearly as long as the following three together, the third slightly dilated, the fourth provided with lateral long and narrow appendices; all except the fourth slightly infusate towards the end.

The whole upper surface is smooth and shining, not shagreened: Length of body 5.2 mm. 1 single ♀ from Baram Station, Sarawak. leg. Dr. E. Mjöberg.

Typus in coll. Benick.

This new species differs from the Japanese *Stenus flavidulus* Sh., by the large maculae of the elytra being entirely absent in the former species, and further by the stronger punctures of the whole body and longer and slender antennae.

It gives me great pleasure to name this beautiful species after the discoverer, Dr. E. Mjöberg, Curator of the Sarawak Museum.

STENUS SETOSUS n. sp. (Pl. 14, fig. 5—6.)

Allied to the group of *St. bispinus* Motsch.

Lead-coloured, shining antennae, palpi and legs yellow: only the seventh and eighth joints of antennae dark, of the legs only the knees black, the whole body densely covered with silvery-grey hairs; the basal segment covered by thick, straight, backwardly directed silvery hairs; punctures moderately strong and dense.

Head fairly broad, broader than prothorax, of the same width as elytra, hardly impressed and provided with shallow furrows; median parts indistinctly elevated; behind the antennae some smooth surfaces, otherwise the punctures are fairly dense, moderately strong and deep; anterior parts of head with long white hairs; antennae slender, the two basal joints incrassate, of the same length, the 3rd twice as long as the 2nd and more slender, the 4th hardly shorter than the 3rd, the following joints up to the 8th gradually becoming shorter: the three club-shaped apical joints of the same length as the 8th, nearly twice as long as broad; palpi long, slender, last joint club-shaped, curved outwards at the top,

Elytra as long as prothorax but considerably wider, the humeral corners strongly prominent, laterally nearly parallel, in the apical third rounded and constricted, at the tips broadly emarginate, fairly convex, near the suture slightly impressed, at the base densely covered by silvery hairs, roughly punctured, punctures rarely confluent.

Abdomen considerably more narrow than elytra in posterior parts but broader than prothorax, not tapering towards the end, the three basal segments fairly strongly constricted without lateral margin, last segment provided with a pair of short and sharp chitinous hooks, shorter and not so strongly curved as in *St. bispinus* Motsch; basal segment densely covered with whitish, stiff hairs, which are parallel except at the tips, where they are curved inwards.

Punctures rough only at the constricted parts of the segments, otherwise fine and not very deep; the fifth ring shows a free skinfold; apical segment with a hairy spot near its posterior margin.

Legs strong and of moderate length, femora fairly strongly constricted towards the tips, knees broadly infuscate, on the femora to more than the apical half, on the tibia not quite to the middle; on the femora the dark is strictly limited, which is not the case on the tibia; tarsi short, the first joint twice as long as the second, which is of the same length as the following, fourth joint with broad appendices.

Anterior parts of body only finely reticulated at the base of elytra; abdomen deeply shagreened.

The characteristics of the male-sex consist in a fairly broad and deep excision on the sixth ventral segment, which is rounded at the base.

Length of body 3.8 mm. (at extended abdomen). 1 ♂ from Kuching, Sarawak. leg. Dr. E. Mjöberg.

Typus in coll. Benick.

Differs at the first glance from all other members of the *bispinus* group by the colouration of the knees; no other species shows a similar arrangement of hairs on the basal parts of abdomen. It is possible that the dark colouration of the 7th to 8th joints of the antennae is to be regarded as abnormal.

STENUS MEYERI n. sp. (Pl. 14, fig. 7—8.)

Black, only slightly shining, antennae, palpi and legs yellow, antennae intuscate only at the tips, punctures rough and dense, rugose; only tip of abdomen with very fine, short hairs.

Head broad, broader than elytra; eyes big, prominent; frons deeply excavated, with deeply impressed slightly convergent frontal furrows, roughly and deeply punctured except at the base of insertion of antennae; antennae moderately slender, on the inside, except on the two basal joints, provided with some long, thin hairs, 2nd joint slightly longer than broad, 3rd joint slender, nearly three times as long as broad, 4th about $1\frac{3}{4}$ as long as second, following joints gradually decreasing in length; the apical club-shaped joints are all longer than broad; palpi long and slender.

Prothorax hardly longer than broad, its greatest width before the middle, forwards strongly constricted, behind the middle parallel, from there slightly concave, very densely and deeply punctured; punctures here and there confluent, reminiscent of *St. clavicornis* Scop. from Middle Europe.

Elytra at the suture nearly shorter than prothorax, not convex, humeral angles distinctly set off, laterally slightly rounded, backwards broadly emarginate, suture-line broadly impressed, anterior margin with a faint border; punctures rougher than on prothorax, equally rugose.

Abdomen narrower than elytra and prothorax, tapering towards the apex, laterally with a fine border, segments without median carina, the first segments are constricted, roughly and densely punctured, punctures towards posterior margin becoming finer, generally of half the size of those of the head; on the last tergites still finer, at the end of the fifth segment a fine, whitish skinfold; the dorsal slight emargination of the seventh segment carries a fine but distinct granulation, but no comb-like teeth.

Legs robust, tarsi of half the length of tibiae, first joint of the same length as the three following together, fourth provided with long, narrow appendices.

The whole upper surface shows microsculpture, deepest on the abdomen; on the anterior parts some fine, engraved striae are visible, especially on the head.

Length of body 4.6--5.2 mm. ; 2 ♀ from Pah Trap, Kalabit country (3000 ft.) N. Sarawak. leg. Dr. E. Mjöberg.

Typus in coll. Benick.

I am pleased to name this species after my friend, Mr. Paul Meyer in Mailand, who is an enthusiastic student of Coleoptera.

STENUS KURSEONGINUS Bernh.

To this species I refer 1 ♂, which agrees quite well with Bernhauer's description.

Upper surface smooth shining, the fifth tergite possesses a whitish skinfold, the seventh is slightly emarginate at the posterior margin, in this emargination a comb of very stiff hairs is to be seen as described previously in *St. mjobergi* Bck.

The ♂ characters are very distinct. The sixth sternite shows a deep incision, about three times deeper than broad at the entrance; the characters of the fifth segment are not so pronounced, no emargination is to be seen, but the hairs towards the posterior margin are more dense; the fourth segment is broadly emarginate, along the middle slightly impressed, finer punctured and more densely hairy; the third segment shows still fainter characters; metasternum with a broad shallow impression, which is densely and finely punctured; hind femora show behind the base an obtuse process, from there constricted and in their middle (club-shaped) dilated; hind tibiae in their last third curved outwards into an obtuse angle and with a process.

Length of body 5.6 mm. ; 1 ♂ from Bau, Sarawak. Leg Dr. E. Mjöberg.

Distribution : Ost.-Himalaya (Kurseong).

STENUS GIBBIFRONS n. sp.

Belongs to the *prolixus* group.

Black, slightly bluish-shining, fairly deeply punctured, finely and densely hairy, border of anterior parts of head, antennae, palpi and legs yellow.

Head broad, about as broad as the elytra, fairly deeply excavated, the furrows of the frons joining forwards; along the middle a tubercle with smooth and shining surface is visible: also the base of insertion of antennae and a smaller

spot near each eye smooth and shining, otherwise the whole of the frons is moderately roughly, fairly densely and deeply punctured; antennae slender, the two basal joints thicker, 2nd joint shorter than 1st, 3rd much more slender, about $2\frac{1}{2}$ times longer than 2nd, 4th $2\frac{2}{3}$ times the length of the 2nd, 5th still shorter, club-shaped, apical joints longer than broad; palpi slender.

Prothorax narrow, nearly twice as long as broad, laterally hardly dilated, behind the middle slightly constricted, equally convex, fairly roughly but not rugosely punctured; backwards a small, smooth median line is visible.

Elytra at the suture of the same length as prothorax, but considerably broader, the humeral angles prominent, sides parallel, backwards slightly constricted, at the posterior margin broadly emarginate, at the base of the suture impressed, punctures of a similar kind as on prothorax, not confluent.

Abdomen at the base considerably narrower than elytra, laterally not bordered, across the four first segments constricted, nearly as strongly but not so densely punctured as elytra, punctures of the last segment considerably finer; the 5th tergite shows a whitish skinfold.

Legs slender, femora towards the apex broadly constricted; tarsi slightly more than half as long as the tibia, 1st joint nearly as long as the following together, the last ones with long hairs, the 4th bilobate.

The upper surface shows no sign of a microsculpture.

Length of body 5.8 mm. 1 ♀ from Bandar Baro, Sumatra, East Coast, 850 metres (Corporal).

Typus in coll. Benick.

Explanation of Plate 14.

- Fig. 1. *Kalabita operculata* n. sp., natural size.*
 .. 2. *Pomponia rajah* n. sp., natural size.*
 .. 3. *Stenus njöbergi* n. sp., (12/1).
 The fine punctures of elytra mark the dark maculae.
 .. 4. Tip of abdomen of *Stenus njöbergi* n. sp. (90/1).
 .. 5. *Stenus setosus* n. sp. (12/1).
 .. 6. Tip of abdomen of *Stenus setosus* n. sp. (25/1).
 .. 7. *Stenus meyeri* n. sp. (12/1).
 .. 8. Hind tarsus of *Stenus meyeri* n. sp. (20/1).

* For description see Art. XXXIV, Cicadas from N. Sarawak. By the late Dr. J. C. Moulton.

**XXXII.—Noctuid Moths from some of the
Mountains of Sarawak.** By MISS A. E.
PROUT.

(With two Plates.)

PART II.

INTRODUCTION.

In publishing the second and last instalment of the catalogue of Noctuidae contained in the Mjöberg collections from the mountains of Sarawak, we desire to acknowledge gratefully our indebtedness to Mr. W. H. T. Tams for his kind assistance in the slow and arduous task of comparing specimens with the National Collection and for suggestions offered and information freely given.

This paper contains ten species in the earlier subfamilies, which were not fully worked out when the first paper went to press or which have since come to hand. Of these ten species, seven are described as new, two are too poor for description and one is left under an old name, though it may well be racially distinct.

The *Hypeninae*, which form well over one-third of the entire collection of Noctuidae, are extremely interesting, more than half being apparently new to science. Out of forty-four species listed here twenty-two are described as new and three others are in all likelihood new, though too poor to be described. Of the twenty-nine types hereafter described sixteen belong to the Mt. Murud collection; nine are from Mt. Poi; one is from Mt. Dulit and one holotype and two allotypes are from Mt. Penrissen. The remaining two types are specimens in the Joicey collection from other sources, which were selected as representing the species much better than the specimens received in the Mjöberg collections. There will also be found, in the Supplement, four new species from Mt. Matang; two *Acontianae*, one *Ophiderid*, one *Hypenid*.

ERASTRIANAE.

68. STENOLOBA ROBUSTA sp. n.

♀ 27 mm.

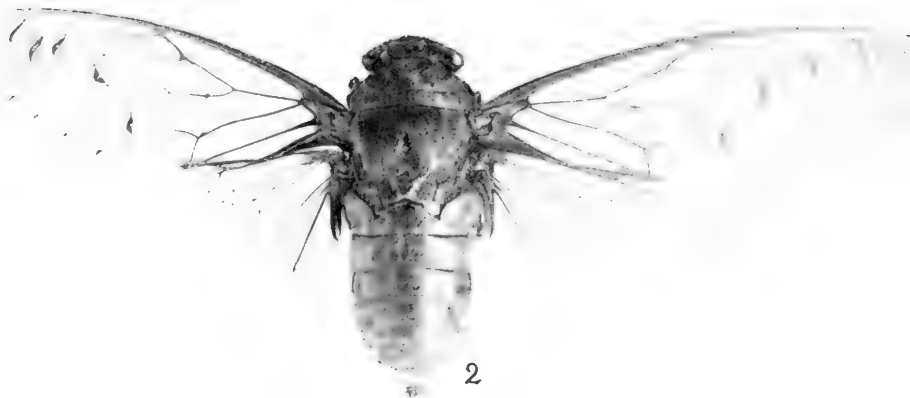
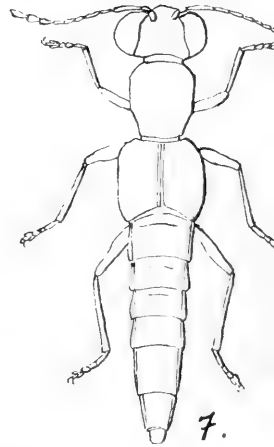
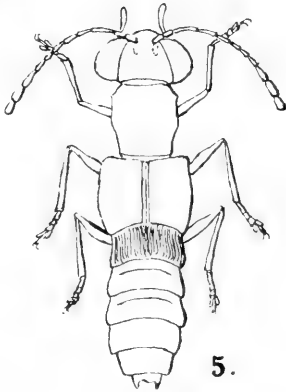
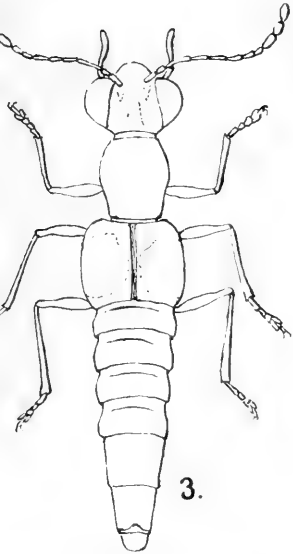
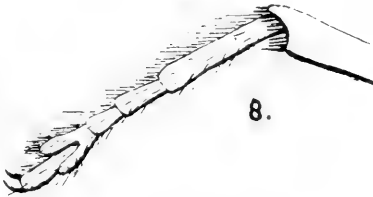
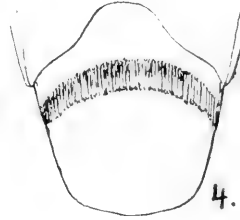
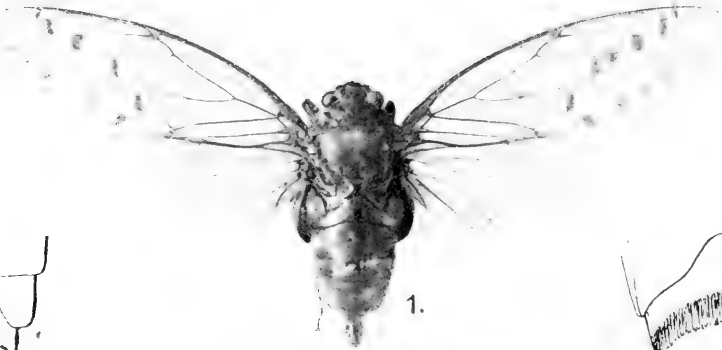
Coloration of head, body and fore wing somewhat as in *ferrimacula*, (*Erastria ferrimacula* Hmps., Journ. Bom. Soc., xvii, p. 472, 1906, Khasias), but the pale areas of fore wing purer white. Markings of fore wing a good deal as in *ferrimacula*, but the orbicular less distinct; the double dark costal streaks at origin of ante- and postmedial lines weaker; the reniform more strongly dark outlined, more constricted at middle; postmedial more broadly excurved round disc, minutely dentate, with conspicuous white discal streak on posterior fourth; *robusta* has a strong citrine green suffusion (Ridgway, pl. iv), mixed with blackish, from base to antemedial line and to middle of costa in type, to middle of costa and (broadly) round about the oblique antemedial in paratype; there is also a very dark green diamond-shaped subapical spot in both specimens. *Hind wing* whitish, with slight discal lunule placed on a very weak medial line, and slight fuscous terminal shade limited by a faintly traceable postmedial line. *Underside* of fore wing pale fuscous-brown, the costa white between medial and postmedial dark spots; the white costal spots between postmedial line and apex large and distinct; traces of a discal spot and postmedial line. *Hind wing* white, with diffused medial half-line from scarcely one-third costa; dark discal spot; wavy postmedial (strongly excurved round disc) and a dark terminal shade (somewhat broken near apex).

Mt. Murud, 6500 feet. November—2 ♀.

69. STENOLOBA ELEGANS sp. n.

♂, ♀ 21--23 mm.

Somewhat similar to *S. robusta*, but more slenderly built, with the green shades much paler and more glaucous; the postmedial line intermediate between *robusta* and *ferrimacula* (minutely crenulate); the dark subapical mark reduced to a broad oblique streak; the subbasal line in *elegans* is very





distinct, outwardly oblique (though somewhat waved) from near base of costa to fold, where it is sharply angled, inwardly oblique to near base of hind margin, where it is partly concealed by a thick tuft of scales. *Hind wing* somewhat as in *robusta*, but slightly more irrorated with fuscous, scarcely darkened at termen; medial line absent; a slight discal lunule and curved postmedial line, the latter placed rather near the disc. *Underside* somewhat as in *robusta*; a little paler; hind wing without medial line or dark terminal shade, the postmedial less distinctly waved than in *robusta*, diffused and somewhat variable.

Mt. Poi, 5200 feet, 3 ♂, 1 ♀; 5000 feet, 2 ♂; 4500 feet, 1 ♀; 4350 feet, ♂ holotype.

Superficially this species somewhat nearly resembles *Chytonix elegans* Schs., A. M. N. H. (8), vii, p. 43, 1911. Costa Rica.

SARROTHRIPINAE.

70. CHLOETHRIPA LEUCOCEPHALA sp. n.

♀ 23 mm.

Palpus with segment 3 extremely long (nearly $1\frac{1}{2}$ length of segment 2), stout but without long hair; white irrorated with fuscous. Head and thorax pure white. *Fore wing* white irrorated with green, largely suffused with citrine (on posterior fourth of median area) and olive, leaving only the anterior half of proximal fourth and a broad anterior patch from postmedial line to apex whitish; the lines pure white, the antemedial oblique from near base of costa to fold, where it is broadly rounded, bent inward to hind margin; postmedial (apparently) from little beyond $\frac{1}{3}$ costa, horizontal in anterior part of cell to beyond the small dark discal spot (which it almost touches in passing), oblique to behind M^1 , bent inward and waved to behind end of cell, bent outward to hind margin; four large white spots on costa beyond postmedial line, the last indicating the origin of subterminal line which is bent outward to SC^5 , very fine and nearly straight to fold, where it forms a broad white lunule, as in *C. chlorana*, (*Sarrothripa chlorana* Hmps. n., Moths Ind., iv, p. 528, 1896, Sikkim). *Hind wing* above and both wings beneath as in *chlorana*.

Mt. Murud, 4500 feet, November—1 ♀.

The striking difference in segment 3 of palpus should place this species in a separate section of *Chloethripa* from *chlorana*; but in neuration and other structural points, as well as in general facies, the two species seem to agree perfectly and I have no hesitation in referring *leucocephala* to this genus.

71. *BLENINA SUBTERMINALIS* sp. n.

♀ 38 mm.

Thorax and fore wing whitish almost entirely suffused and irrorated with vinaceous-grey (Ridgway, pl. 50) and cinnamon-brown (l.c. pl. xv), except the subterminal line; abdomen and hind wing drab, the former with a conspicuous quadrate white crest on first segment. *Fore wing* with the lines somewhat indistinct (except subterminal); ante- and postmedial blackish marked by large black spots at costa, strongly waved and excurved, the area between them with some blackish suffusion, the postmedial with a large diffused dark spot beyond it on costa; a black orbicular dot and small, somewhat oval, dark-outlined reniform; subterminal line suffused with brown at costa, then broad, outstandingly white, deeply angled inward at M^2 and somewhat deeply so in fold, minutely dentate before and behind the angles; termen very narrowly pale, with a straight dark terminal line interrupted at the veins; fringe white, chequered with brown. *Hind wing* and underside almost uniform drab, except the fringes, which are slightly chequered on hind wing, strongly so on fore wing.

Mt. Murud, 6500 feet, November—1 ♀ (slightly worn).

The fore wing in *subterminalis* is rather unusually broad, the hind wing rather small, with termen evenly rounded. In addition to crests (the second small and drab), the abdomen has some rough hair on the first two segments.

OPHIDERINÆ.

PARADIOPA gen. n.

Proboscis, eye and frons normal, the frons clothed with shining silvery-white, flattened scales. Palpus with segment 1 normal; segment 2 very slightly curved at proximal end only (apparently almost correct), about $1\frac{1}{2}$ diameter of eye,

with the scaling slightly lengthened in front and at distal end behind; segment 3 about $\frac{1}{3}$ length of 2, straight, stout but practically glabrous. Thorax clothed with rather long, narrow scales, the metathorax with large, somewhat oblique crest; prothorax with smaller, somewhat more erect crest. Abdomen with crests on first three segments, large on 1 and 3 (especially so on 1). *Fore wing* rather narrow, with costa weakly curved throughout; termen obliquely rounded, crenulate; hind margin strongly down-curved (almost lobed) on proximal half; cell scarcely more than $\frac{1}{2}$ length of wing; C^1 from about $\frac{3}{5}$ cell; areole very narrow, with SC^2 , SC^3 , SC^4 , SC^5 from end, SC^5 connate or minutely stalked with SC^3 , SC^4 , which are stalked to about $\frac{1}{2}$; R^1 from angle; R^2 and M^1 from close before and behind angle; M^2 from scarcely $\frac{2}{3}$ cell; SM^2 strongly down-curved on proximal $\frac{1}{2}$. *Hind wing* moderately narrow, with the termen evenly rounded; cell nearly $\frac{1}{2}$ length of wing, with the discocellulars somewhat oblique, leaving the posterior end longer than the anterior; anastomosis to fully $\frac{1}{2}$; C rapidly diverging; SC^2 , R^1 , R^3 and M^1 from angles; R^2 weakly tubular, from just behind middle of discocellulars; M^2 from fully $\frac{3}{5}$ cell. With the exception of half one fore leg, the legs are unfortunately wanting in the type specimen.

Type: *P. parthenia* sp. n.

72. PARADIOPA PARTHENIA sp. n.

♀ 27 mm.

Frons silvery-white. Thorax above brownish drab (Ridgway pl. xlv), shaded with very deep warm sepia; abdomen drab with the crests brown, whiter beneath. *Fore wing* brownish-drab somewhat thickly irrorated with and with the lines warm sepia: subbasal represented by double, curved striae at costa and in cell; antemedial from a diffused dark spot at about $\frac{1}{4}$ costa, ill-defined and bent outward to behind M, double, oblique and waved from behind M to $\frac{1}{4}$ hind margin; a short, broad claviform, indicated by a blackish lunule at its distal end; orbicular a dark outlined greenish-white round spot; an erect, diffused medial shade from costa to cell, reappearing at M (farther distad) and oblique to middle of hind margin; reniform indistinctly

dark outlined, kidney-shaped, very near the orbicular; post-medial line lunular, double, the proximal line well-defined except at costa, from about $3/5$ costa, strongly bent outward to SC^5 , angled inward opposite the disc, somewhat angled outward on R^3 and M^1 , thence slightly incurved to hind margin; a broad, diffused subterminal shade from costa to M^2 , strongly excurved from costa to R^2 , where it is angled inward, excurved from R^2 to M^2 , followed by a fine, twice dentate greenish-white mark in fold; the interneural dark spots broad and conspicuous; fringe slightly paler than wing but darkened at the veins. *Hind wing* drab on proximal third and from before middle to termen, leaving a slight semi-hayline bar between the two dark areas, which hardly reaches to behind M^2 ; fringe white. *Underside* of both wings drab, with proximal half and veins somewhat paler; fringes as above.

Mt. Dulit, 3000 feet—1 ♀.

The single ♀ upon which this genus is erected has proved more difficult to place than any other Noctuid in these collections, and it is only after a prolonged and earnest effort to place it in some previously described genus that I have at last regretfully decided that it is necessary to erect for it a new genus.

The weakness and, especially, the position of R^2 of the hind wing suggests the possibility that *parthenia* may belong to the *Trijinæ* (*Acronyctinæ*); but upon closer examination R^2 appears to be weakly tubular; moreover, the palpus is too long for a normal Trifid and the cell of the fore wing is too short. This last character, although it does not appear to have been employed by any previous author, seems to me an important secondary point in distinguishing the *Trijinæ* from the *Quadrijinæ*, the cell averaging distinctly longer in typical *Trijinæ* than in typical *Quadrijinæ*. From its aspects, *P. parthenia* might well belong to the *Eutelinae*, but the frenulum is not simple; moreover, in the *Eutelinae* R^2 of the hind wing is almost always strong. From close to angle of cell. The genus appears nearest to the South American genus *Diopa*; on this account and on account of its stout build and general facies I have decided to place it provisionally in the *Ophiderinae* rather than in the *Erastrinae*, to which latter subfamily it should perhaps be referred by the subfamily

key in Cat. Lep. Phal., iv. By Sir G. Hampson's MSS key to the Ophiderinae ("Noctuinae") this genus would fall with *Diopa* Wlkr., and, were it not that the difference of region renders any close affinity extremely improbable, it might have been possible to place *parthenia* in *Diopa*; but *Diopa* the hind margin of fore wing is more normal, the areole is larger and there are a number of other minor differences which seem to justify the erection of a distinct genus in view of the strong probability that when the ♂ is known and the genitalia can be examined the resemblance between *Diopa* and *Paradiopa* will be found to be comparatively superficial.

73. MIMEOGOA species.

Mt. Murud, 6500 feet. November—1 ♀.

This specimen appears to belong to an undescribed species, but as it is a single ♀ in not quite first rate condition and is a very small, inconspicuous insect it has not seemed advisable to describe it. By structure it almost certainly belongs to the genus *Mimeogoa* Hmps.

74. TOLPIA species.

Mt. Murud, 6500 feet, November—1 ♀.

Like the foregoing, this may probably belong to a new species, but for similar reasons I refrain from describing it. It appears nearest to *T. argentescens* Hmps. (Journ. Bomb. Soc., xxi, p. 1234, 1912, Ceylon), and *plumbefusa* Hmps., (l.c., xvii, p. 650, 1907, Ceylon,) of one or other of which it may quite possibly be the Malayan representative.

75. VARICOSIA VENATA Hmps. CLAVIFERA subsp. n.

♀ 50 mm.

Differs from the typical ♀ in the larger size, the rather more kidney-shaped (more distally indented) discal spot, in the presence of a strong dark claviform spot on distal edge of antemedial line and in having the posterior fourth of fore wing paler, more contrasted with the anterior three-fourths, than in typical *venata*, (The Entom., lvii, p. 132, 1924, Ceylon); subspecies *clavifera* also differs in having the hind

wing more uniformly darkened, with a better-defined discal spot. On the underside the fore wing is more uniformly darkened than in *venata venata* and the postmedial line on hind wing is rather further removed from the termen (nearer to discal spot), at least on its posterior half.

Mt. Murud, November, without exact elevation—1 female.

76. *DIOMEA ROTUNDATA* Wlkr.

Diomea rotundata Wlkr., Spec. Lep. Ins., xiii, p. 1110, 1857, Ceylon.

Mt. Poi, 4500 feet, 1 male.

This is not a certain identification, the subterminal line on fore wing being exceptionally dentate; but in other respects it so closely resembles one specimen in Coll. Brit. Mus. from Ceylon, and there is so much individual variation in this species, unless we have two or three species mixed under the name *rotundata*, that it has seemed better not to erect a new species on the strength of a single specimen.

77. *TAMBA COSMOLOMA* sp. n.

♀ 40 mm.

Head, body, legs and wings predominantly light buff, the thorax and wings finely irrorated with pink. *Fore wing* with the costa narrowly snuff-brown (Ridgway, pl. xxix), with slight brown irroration behind it; lines (except postmedial) nearly obsolete; faint traces of the subbasal and antemedial, double, waved and excurved; cell with two minute blackish dots, one (orbicular) at nearly $\frac{2}{3}$, the other on proximal edge of a large, kidney-shaped reniform, which is very indistinctly indicated by a pale outline; postmedial line almost lost on its anterior fourth, very indistinct, double, somewhat oblique from R^1 to hind margin; an oblique purplish shade, mixed with brick-red, from termen just behind apex to postmedial line, along which it is continued almost to hind margin, giving off a proximal red lobe at its junction with line; area from this shade to termen tinged with violet and red, with only weak traces of the subterminal line; an arrow-shaped purple mark along R^2 , its (broad) head pointing towards termen; small interneural dark lunules, well removed from termen. *Hind wing* reproducing coloration and pattern of fore wing, but cell with only one black dot; postmedial line moderately distinct throughout and (rather

closely) preceded by an indistinct double medial line; subterminal fairly distinct throughout, angled inward at SC^2 and behind R^1 ; the purple shading of the border deeper than on fore wing; a red shade from near apex to behind R^1 , corresponding to the shade from near apex on fore wing; on arrow-mark on R^2 . *Underside* of both wings somewhat as above, but with less pink irroration except beyond postmedial line, which is single, minutely waved, distinct; other lines practically obsolete; terminal shades weaker than above, especially on hind wing, the fore wing without dark apical and arrow-marks.

Mt. Poi, 200 feet—1 ♀.

In the absence of the ♂, it is impossible to assign to this species its true position in the genus. Perhaps near to *T. tephraea* (*Zethes tephraea* Turner, Proc. Linn. Soc. N.S.W., xxxiv, p. 348, 1909, Queensland). Probably nearest to an undescribed species.

HYPENINAE.

In view of the fact that the key definition of this subfamily given in Cat. Lep. Phal., iv, certainly does not in all cases hold good, a preliminary note on what is here meant by the name may not be out of place.

In the *majority* of Ophiderinae R^2 of the hind wing is given off from close to angle of cell, whilst in many of the Hypeninae it is given off at from $\frac{1}{2}$ to $\frac{3}{4}$ discocellulars; but there are a large number of exceptions. For example: in two of the best-known Hypenid genera, *Nodaria* and *Simplicia*, R^2 is given off almost from the angle; but both these genera are distinguished by the very long sickle-shaped palpus and also, in the ♂, by the sheath on the fore leg, concealing the tibia and (usually) one or two segments of the tarsus. This is a not uncommon character in the Hypeninae but I have not at present come across any example of it in the Ophiderinae.

Although I am not at present prepared to give any infallible distinction between the two subfamilies, the following points may be taken as a general guide. Sir G. Hampson's distinction based upon vein R^2 (to be used with certain reservations). The exceptional length of palpus, which is usually either sickle-shaped (as in *Simplicia*), with the second segment curved throughout, or straight and normally

porrect (as in *Hypena*). In the majority of Hypenid genera the ♂ has some specialized secondary character, sheath on fore leg, aborted fore tibia (with or without sheath), fold on costa of fore wing beneath, large tuft of hair on fore wing above or beneath or upon palpus or antenna, etc. The neuration appears to be much more variable than in most of the other subfamilies, the ♂ sometimes differing from the ♀ of the same species, or occasionally even individuals of one sex showing slight variation; in the genus *Hydrillodes* (possibly in other genera) some species have vein C of the hind wing anastomosing about normally whilst in other species there is no true anastomosis at all, C being joined to SC by a minute bar; this character, which by Sir G. Hampson's key to the families should not occur in the Noctuidae at all, seems to be not very uncommon in the Hypeninae. The build is generally slender and, apart from the palpus and secondary sexual tufts, the hairy vestiture is usually somewhat weak, even on pectus and legs. Although insufficient work has at present been done to allow of the publication of reliable statistics, the examination of the length of legs in this and other subfamilies, so far as at present carried out, seems to confirm Sir G. Hampson's statement in "Moths of India," Vol. III (subfamily diagnosis), that the legs average long.

There is almost certainly a difference in the shape of the body and also in the tympanum, which in most Hypeninae appears almost to divide the thorax and abdomen, cutting obliquely between the two. In more typical Noctuidae I have never observed this divided appearance—though the difference may be partly due to a difference in hairy vestiture.

The genera included in the above synopsis are for the most part those placed under "Polopogoninae" (Deltoidae) in Coll. British Museum; though some genera which were placed in the Hypeninae in "Moths of India," Vol. III but are now in the Ophiderinae may not improbably have to return to the former position when a more thorough study of them is undertaken.

ELYRA (?) EUGENES sp. n.

♂ 33 mm.; ♀ 31 mm.

♂ antenna bipectinate, the pectinations rather long, ending in curved bristles; ♀ with short bristles and very short cilia.

♂ palpus with segment 1 curved, rather more than diameter of eye; segment 2 three or four times diameter of eye, down-curved, clothed beneath with loose hair except at proximal end; segment 3 almost one-half length of 2, hairy and with a tuft of long hair beneath; ♀ sickle-shaped, with segment 1 nearly normal; 2 strongly curved throughout, about three times diameter of eye, with slight hair behind; 3 acuminate, about two-thirds length of 2. ♂ with a dense tuft of hair (on sheath?) covering the tibia and first segment of tarsus; mid and hind tibia tufted with blackish hair. Legs slender in ♀.

♂, ♀. Palpus, thorax and fore wing a dark warm sepia (Ridgway, pl. xxix), the hair on ♂ palpus ochraceous-buff; an ochraceous-buff spot at base of antennal shaft. *Fore wing* with the lines pale buff shaded with rufous; ante- and postmedial double, filled in with the ground-colour; ante-medial nearly erect; postmedial strongly bent outward round the disc, oblique and slightly incurved to just beyond middle of hind margin; subterminal single, nearly straight from costa to SC^5 , angled inward to postmedial line at middle of disc, curved outward to behind R^2 , incurved in fold; terminal dark lunules very broad; reniform erect, rather narrow, outlined in pure white; in the ♀ the distal half of white outline is almost obsolete. *Hind wing* fuscous-brown with slight pale postmedial and subterminal lines, obsolescent on anterior half of wing; terminal lunules broadened as on fore wing. *Underside* pale fuscous-drab with whitish postmedial and subterminal lines (minutely dentate on hind wing); hind wing with large dark discal spot, a smaller dark spot before it in cell.

Mt. Murud, November, without exact elevation—1 ♂;
Mt. Penrissen, 4400 feet—1 ♀.

When this group is more thoroughly understood, *eugenes* may probably be found to belong to a distinct genus. It differs from *Mastigophorus brevivittalis* Moore, Proc. Zool. Soc., 1867, p. 87, Sikkim, now placed in *Elyra* in the British National Collection, in having the cell of fore wing slightly longer; SC^2 from areole (not stalked with SC^3 SC^4); R^2 of hind wing from about $\frac{2}{3}$ instead of almost from angle; ♂ palpus with segment 1 shorter, more curved, segment 2 much more curved and more hairy, segment 3

curved, and other minor differences; ♀ palpus hairy on segment 2 behind and with a suggestion of tuft at middle of segment 3 behind (worn); abdomen with small crests on one or two basal segments; ♂ fore leg apparently with a sheath; mid tibia and tarsus fully as long as hind tibia and tarsus (much shorter in *brevivittalis*). But the underside and the strong angulation at R² of fore wing above of the subterminal line strongly recall *brevivittalis*, and in that insect the ♂ palpus is sometimes drawn forward in a similar manner, suggesting an affinity; and as neither *phlegeusalis* Wlkr., type of *Elyra*, nor *larusalis* Wlkr., type of *Isana* (sunk by Hampson to *Elyra*) is yet known to me I have not ventured to erect a new genus. Hampson places *brevivittalis* in the *Isana* section of *Elyra*.

RAPHISCOPE Hampson

To Hampson's diagnosis published A. M. N. H. (9) xv, p. 408, 1925, the following additions or corrections may be added. Palpus typically with segment 2 about $1\frac{3}{4}$ diameter of eye; segment 3 about twice length of 2. ♀ palpus sickle-shaped, with segment 1 normal; segment 2 fully twice eye, with short hair in front, tapering to distal end; segment 3 slender, acute, glabrous, nearly as long as 2. ♂ antenna typically with four long, straight oblique teeth on outer side before middle (not "at two-thirds"). Hind wing with cell about $\frac{3}{2}$; R² from about $\frac{2}{3}$ -- $\frac{3}{4}$ discocellulars; anastomosis typically to about $\frac{2}{5}$.

Section II. Fore wing with areole, formed by a short bar thrown across from SC⁵ to SC²; SC³, SC⁴, SC² being given off a little earlier than in *invenusta* (from areole); anastomosis to barely $\frac{1}{3}$; ♂ palpus with segment 2 fully twice eye, segment 3 only about $\frac{3}{4}$ length of 2; ♂ antenna strongly serrate, (almost pectinate), the shaft without group of spines.

79. RAPHISCOPE SERRATA sp. n.

♂ 45 mm.; ♀ 43 mm.

Differs from *invenusta*, (*Bertula invenusta* Swinh., A. M. N. H. (7) ix, p. 177, 1902, Pulo Laut) chiefly in the more solid darkening of terminal area of fore wing (beyond postemedial line), only interrupted by the well-defined paler subterminal, which is much less dentate on R³ and M¹

than in *invenusta*, and in the curve of the postmedial line, which in *serrata* is more strongly bent outward from costa, distally concave at R^2 , inwardly oblique (though minutely dentate on veins) from R^3 to middle of fold, distally dentate on SM^2 and hind margin; orbicular and reniform white, the former a sharply-marked round dot; medial area of wing less clearly buff-pink (Ridgway, pl. xxxviii), with broader dark clouding than in *invenusta*. Hind wing nearly as in *invenusta*, but termen slightly fuller (more rounded), at least in the ♂. Underside less tinged with buff than in *invenusta*, the postmedial line on both wings somewhat more excurved.

Mt. Murud, November, without elevation—1 ♀. The ♂ holotype is also from this collection, almost certainly from Mt. Murud, but is unfortunately one of the specimens over which some confusion has arisen in labelling.

In view of the important difference in neuration it may be necessary later on to create a new genus for *serrata*; but *serrata* and *invenusta* are so obviously nearly related and the transition from no areole to areole (by means of short bar) is in this instance so easily explained that I have preferred to describe *serrata* as a *Raphiscopa*.

80. LITHILARIA species.

Mt. Murud, 6000-6500 feet, October—1 ♀.

This specimen, which has lost one hind wing and is otherwise not in first rate condition, appears to be nearly related to *Mastigophorus punctilinea* Wileman (placed by Sir G. Hampson in *Lithilaria*), the type of which I have been permitted to see, by the kindness of Mr. Wileman. It might possibly even be the ♀ of *punctilinea*, but will far more probably be found to be at least racially distinct. It has not seemed advisable to publish any description from one rather poor ♀.

81. BLEPTINA DELOSTICHA Swinh.

Bleptina delosticha Swinh., A.M.N.H. (7) xvii, p. 552, Sumatra.

This species seems to be confined to the Malayan subregion. It is almost certainly neither a *Bleptina* (American) nor a *Bertula*. Perhaps more nearly related to *Adrapsa*, but the cell of hind wing is slightly long for that genus, with R^2 rather far removed from the angle. As the affinities of *delosticha* are so uncertain I have preferred to quote it under the genus in which it was originally described.

82. *BERTULA LEUCOPIS* Hmps.

Bertula leucopis Hmps., A.M.N.H. (9) xv, p. 410, 1925, Ichang.

Mt. Poi, 200 feet—1 ♂.

This specimen has a distinct dark claviform mark which is absent in the type; otherwise there seems little to differentiate the two. Possibly racially distinct.

83. *BERTULA ROSTRILINEA* sp. n.

♀ 28 mm.

Palpus, head and thorax above cinnamon tinged with tawny; abdomen, body beneath and legs predominantly a dark drab. *Fore wing* cinnamon tinged with tawny to postmedial line, dark drab to termen; subbasal and antemedial lines indicated by metallic blue scales, the former curved, close to body, the latter outwardly dentate at SC and M, oblique from M to hind margin near base; a black spot just beyond it on costa; reniform obliquely oval, pale, with a dark streak at middle, the area beside and behind it darkened from near antemedial line to postmedial; postmedial line double, crenulate, the inner line fine from a broad black spot on costa, bent outward from costa, inwardly oblique to middle of disc, where the inner line touches the reniform, angled outward at M¹, upon which and on M² it is sharply dentate, slightly dentate in fold and on SM² but nearly erect from M² to middle of hind margin, distally defined by an almost black shade, which is sharply defined on its outer edge by some metallic blue scales (weak towards costa), nearly erect from costa to near R³, behind which it is bent outward in a snout-like prominence, thence strongly retracted and incurved to hind margin; subterminal tawny, outlined on each side by dark scales, bent outward between SC⁵ and R², strongly bent outward to M¹, where at M², in fold and at SM² it is distally dentate; terminal dark lunules fairly distinct. *Hind wing* dark drab with a bright tawny, dentate subterminal line, obsolescent on anterior half of wing; preceded on posterior half by metallic blue scales. *Underside* dark drab, with slight discal lunule, weak dark postmedial and pale subterminal line on both wings; fore wing bright tawny at and behind proximal three-fourths of costa.

Mt. Penrissen, 4400 feet—1 ♀.

In the absence of the ♂ the generic position of *rostrilinea* is not quite certain, especially as the small triangular tuft at middle of segment 3 of palpus behind is wanting; but there is a small dark mark on the segment where the tuft should come, suggesting that it is merely worn off (as often happens in poor ♀ of this genus) and *rostrilinea* appears to be a *Bertula*, perhaps nearest to *impuralis*, (*Bleptina impuralis* Hmps. n., Journ. Bombay Soc., xi, p. 698, 1898, Khāsias.)

84. NODARIA EXTERNALIS Guen.

Nodaris externalis Guen., Delt. et Pyral., p. 64, 1854, Coromandel Coast.

Mt. Poi, 200 feet—1 ♂.

Very widely distributed and common. The only true *Nodaria* known to me from the Indo-Australian region, the other species quoted under this name in the "Moths of India" all belonging to other genera. Structurally *Nodaria* is extremely close to *Simplicia*, to which it should perhaps have been placed next. It is quite in error that Sir G. Hampson describes it as having R^2 of the hind wing "from near middle of discocellulars."

BLEPTINODES Hmps. n.

To the description of this genus published in A. M. N. H. (9) xv, p. 409, 1925, the following additions or corrections are added. Palpus typically with segment 2 fairly well curved throughout, about $1\frac{3}{4}$ --2 diameter of eye. Fore leg with narrow, slender sheath covering tibia and about $\frac{1}{3}$ first segment of tarsus, fitting so closely as to be difficult to discern. Hind wing typically with anastomosis to about $2/5$: cell nearly $2/5$ length of wing (not "half"), with SC^2 , R^1 , R^3 , M^1 shortly stalked (not "from angle"), R^2 , M^1 typically longer stalked than SC^2 , R^1 ; R^2 typically from not quite $\frac{3}{4}$ discocellulars. Note: the stalking varies in individual specimens of *perumbrosa*, but is practically always present—certainly present in the case of R^3 -- M^1 in all specimens at present examined.

Section: Segment 2 of palpus rather more weakly curved, more than twice eye; segment 3 about $\frac{3}{4}$ length of 2, with tuft behind at middle only. Hind wing with anastomosis shorter (to about $\frac{1}{3}$), R^3 -- M^1 very shortly stalked; R^2 more curved than in *perumbrosa*, from close to angle of cell.

85. BLEPTINODES TANAOCROSSA sp. n.

♂. 32 mm.

Palpus, head and thorax deep purplish-fuscous; abdomen greyish-fuscous. *Fore wing* natal brown (Ridgway, pl. xl), more seal brown (pl. xxxix) from antemedial to subterminal line; narrow tawny streaks at base and proximally to antemedial line, which is blackish, erect but dentate at the veins (especially SC); a slight tawny orbicular spot in cell close to antemedial line; reniform narrow, tawny, new-moon shaped; postmedial line blackish, slightly diffused, bent outward at SC⁵--R¹ and at R³--M¹, bent inward opposite disc, inwardly oblique to middle of fold but slightly angled on M², bent outward to SM² and inward to near $\frac{2}{3}$ hind margin; terminal lunules sharply marked; fringe long. *Hind wing* nearly uniform glossy drab, with faint traces of discal spot, postmedial and subterminal lines; terminal lunules weaker than on fore wing; fringe very long, with a dark line through the middle. *Underside* dark drab; hind wing paler than fore wing, with large dark discal spot and pale, wavy, proximally dark edged postmedial and subterminal lines.

Mt. Murud, 6000--6500 feet, November—1 ♂.

86. HIPOEPA FRACTALIS Guen.

Herminia fractalis Guen., Spec. Gén. Lép., viii, p. 60, 1854, Cent. India.

Pah Trap, November—1 ♂.

This species is before me from Ceylon, Burma and Sarawak, but not in sufficient numbers or good enough condition for it to be possible to say whether there is any racial variation. Specimens from Ceylon and Sarawak appear very close.

87. MIXOMELIA PALUMBINA Btlr.

Herminia palumbina Btlr., Ill. Het. B.M., vii, p. 88 pl. cxxxiv, fig. 9, 1889, Dharmasala.

Mt. Murud, November—1 ♀.

An Indian insect; in the Joicey collection from the Khasias only. In the Sarawak ♀ the wings appear slightly more elongate. The reniform is rather more oblique than in Indian specimens; on the hind wing, the anterior part of postmedial line is rather further removed from termen, the line being more oblique from costa to M². On the underside the discal

spot is single on both wings, the lines somewhat weaker than in Indian ♀. These differences may well be racial, but I refrain from erecting a new subspecies upon a single ♀. This species is not extremely close to *M. decipiens* (genotype), but it is now placed in *Mixomelia* in Coll. Brit. Mus. and is structurally sufficiently near to *decipiens* to render it possible to accept the classification.

88. *MIXOMELIA DIGRAMMA* sp. n.

♂, 23 mm.

Coloration and markings nearly as in *M. producta*, (*Nodaria producta* Hampsn., Journ. Bomb. Soc., xvii, p. 669, 1907, Ceylon) from which it differs in the following particulars. Antenna bipectinate (serrate, with stout bristles and cilia, in *producta*). Wings (especially fore wing) rather narrow; antemedial and subterminal lines rather straighter, more parallel (less oblique) than in *producta*, of more equal strength, both outstandingly dark; subbasal and postmedial line and discal spot weakly marked. *Hind wing* with subterminal line nearly obsolete before R¹. *Underside* with subterminal dotted line weaker than in *producta*. Ground-colour rather more fuscous than in *producta*; size smaller.

Mt. Poi, 200 feet—1 ♂.

This does not appear immediately close to the last species, but this group is also included by Sir G. Hampson in *Mixomelia*. Probably *diagramma* is somewhat nearer than *palumbina* to the genotype.

89. "LEUCINODES" *DISCISIGNA* Moore.

Leucinodes discisigna Moore, Proc. Zool. Soc. Lond., 1883, p. 29, Darjeeling.

Mt. Murud, 6500 feet, November—1 ♀; November, without exact elevation—1 ♀.

The ♀ from 6500 feet is larger than the other, with the postmedial line on fore wing rather more strongly bent outward behind M and the subterminal more broadly interrupted at and about fold. In all these respects it agrees better with *Helia lunifera* Moore (Lep. Ceyl., iii, p. 238), which Hampson in his "Moths of India" sinks to *discisigna*, but which appears to me quite separate, being distinguished in the ♂ by the serrate-fasciculate antenna (bipectinate in

discisigna) in addition to the points mentioned above. It is possible that the two specimens from Mt. Murud may prove to be the Sarawak representatives of *discisigna* and *lunifera*, but it is quite impossible to form any definite opinion from two ♀, one of which (the *lunifera* form) is distinctly worn.

Sir G. Hampson has a MSS name for this genus, which seems to stand quite alone, comprising only two or three species of almost exactly similar pattern; but it has seemed undesirable to take up space here with the diagnosis of a genus in which no new species is described. I have therefore as with "*Bleptina*" *delosticha* been obliged to employ the original, incorrect generic name.

90. SIMPLICIA BUTESALIS Wlkr.

Libiosa butesalis Wlkr., Spec. Lep. Ins., xvi, p. 187, 1858, Sarawak.

Mt. Dulit, 3000 feet—1 ♀; Mt. Poi, 4500 feet and 3500 feet—2 ♀.

In the absence of ♂ this cannot be regarded as quite a certain determination, especially as the Mt. Dulit ♀ and one of the two from Mt. Poi are in poor condition; but they appear to belong to *butesalis*. Forms of this species are before me from Ceylon, Central Buru, New Guinea and Rook Is. The eastern form may probably prove racially distinct from the western.

91. SIMPLICIA NIPHONA Btlr.

Bocana niphona Btlr., Ill. Het. B.M., ii, p. 56, pl. xxxviii, fig. 9, 1876, Japan.

Mt. Murud, 6000--6500 feet, October—2 ♀; also 1 ♀ from this collection without data. A single ♀ from Mt. Penrissen, 2000 feet, is placed here provisionally, though the fore wing appears slightly narrow, with the distal spot unusually lunular.

As I have not at present been able to find any constant difference between Malayan, Indian and Japanese specimens of this species, I have employed the oldest name, *niphona* Btlr.; but it is more than probable that a clear study from much larger material will reveal some racial distinction; in which case, the Indian form will stand as *S. similis*. (*Aginua similis* Moore, Lep. Atk., p. 195, 1882, Darjeeling), a name sunk by Hampson in his "Moths of India" to

niphona. The Sarawak form does not appear to have received any separate name. Before me in the Joicey collection from Japan, India, South West Sumatra and Sarawak.

92. SIMPLICIA SIMULATA Moore.

Aginua simulata Moore, Lep. Atk., p. 195, 1882, Central India.

Mt. Poi, 5000 feet—1 ♀.

In the Joicey collection from Ceylon only, but is very close to *caenusalis* Wlkr. (Queensland), of which it may be only a race; in which case the collective species has evidently a wide distribution. In his "Moths of India," Sir G. Hampson erroneously sinks both these species to *robustalis* Guen.

93. SIMPLICIA XANTHOMA sp. n.

♂, 37 mm.

Nearly agrees in structure with *S. turpatalis*, (*Bocana turpatalis* Wlkr., Spec. Lep. Ins., xvi, p. 174, 1858, Ceylon,) sunk by Hampson (erroneously?) in his "Moths of India" (vol. iii, p. 36) to *robustalis* Guen., but the thickening on ♂ antenna is a trifle larger, the third segment of palpus is more densely covered with scales and the androconial hair on fore wing is confined to the costal half of proximal area, narrowing to a point at antemedial line; this hair is absent from the base of hind wing. The ante and postmedial lines and discal spot on fore wing are rather better defined than in *turpatalis*; the pale subterminal is slightly broader, not waved behind costa. Hind wing rather more smoky than in *turpatalis*. Underside darker than in *turpatalis*, the hind wing with the postmedial line broadly diffused and scarcely waved.

Mt. Poi, 4350 feet—1 ♂.

94. SIMPLICIA BREVICOSTA sp. n.

♂, ♀, 48--53 mm.

Antennal shaft in ♂ nearly simple (weakly lamellate beneath), with somewhat fasciculate cilia nearly twice diameter of shaft. The sheath on fore leg covering practically the whole of segment 1 of tarsus, which is itself clothed with long hair (apparently somewhat dilated). *Fore wing* rather broad for a *Simplicia* species, the ♂ costa slightly swollen at base and just before middle of wing; costa

rather short in both sexes, with the termen almost outwardly oblique from apex to R^2 . Areole absent, SC^5 from angle of cell, SC^2 well stalked with SC^3 , SC^4 . Wings dark vinaceous-drab, with the usual *Simplicia* pattern, fore wing rather darker than hind wing; both wings with termen somewhat paler, violet-grey. Fore wing with the discal spot black; ante- and postmedial lines weak, wavy, the ante-medial obliquely curved, postmedial excurved round cell (bent inward at discal fold); subterminal line proximally edged by broad dark shading. Underside nearly uniform drab, both wings with discal spot, postmedial and subterminal lines.

Mt. Poi, 4350 feet—1 ♂, 1 ♀; 5000 feet—2 ♀.

SUBSIMPLICIA Gen. Nov.

Near *simplicia*, from which it differs principally in the position of R^2 of the hind wing, which is given off well before angle of cell (at about $4/5$), and in the weaker curve of segment 2 of palpus, which is fully twice diameter of eye (about $1\frac{3}{4}$ in *S. rectalis* Ev.); in *subsimplicia* this segment is slightly swelled behind on proximal $\frac{1}{3}$ and distinctly tufted on distal $\frac{2}{3}$ (in *rectalis* the thickness is more equal, the scaling slighter). Other points of difference from *Simplicia* (*rectalis*) are as follows:—cells of both wings a little shorter; areole present (very small, with SC^2 well stalked); hind wing with SC^5 - R^1 minutely stalked, R^3 not stalked with M^1 , termen of wing more evenly rounded; segment 3 of palpus only about half the length of 2, with small triangular tuft at middle behind; abdomen with rough dorsal hair on 2 or 3 basal segments; middle and hind leg (tibia and tarsus) rather longer, about $\frac{2}{3}$ and nearly $\frac{3}{4}$ length of costa. The ♂ fore leg short, with a large sheath covered with dense black hair, concealing all but the last two segments of tarsus; about as in *circumscripta*, (*Aginnia circumscripta* Wlkr. Spec. Lep. Ins., xxxiii, p. 1023, 1865, Penang). These sheaths seem often an important generic character in the *Hypeninae*. *Subsimplicia* appears somewhat intermediate to *Adrapsa*, but the latter genus is distinguishable by the unusually short cell of hind wing ($\frac{1}{3}$ or less) and, in the ♂, by the absence of fore-tibial sheath and by the palpus, which shows considerable variation but seems practically never to be sickle-shaped (as in the ♀ and in both sexes of *Simplicia* and *Subsimplicia*).

95. SUBSIMPLICIA PUNCTILINEA sp. n.

♂ 36--41 mm.

Palpus, head and thorax vandyke-brown; abdomen, pectus and legs more purplish-fuscous, the hair on fore leg darker. *Fore wing* somewhat russet to antemedial line, tinged with dark Indian Red (Ridgway, pl. xxvii) from antemedial line to termen; lines somewhat indistinct except the subterminal, which is white, broken into spots, slightly angled outward behind SC⁵ and incurved in fold, where the spot is large and conspicuous; ante- and postmedial lines black, crenulate; antemedial slightly oblique outward from 2/7 costa to middle of fold, angled inward on SM²; postmedial bent outward to R¹, strongly oblique inward from R³ to middle fold, bent outward to hind margin, distally dentate on the veins; no distinct orbicular; discal spot moderately large, blackish; the terminal blackish lunules large and conspicuous; fringe with a conspicuous white line at base. *Hind wing* more drab, with discal spot, postmedial and subterminal lines, the latter slight except at fold, where it is whitish and angled as in *Simplicia* species; termen and fringe as on fore wing. *Underside* nearly uniform fuscous-brown with a slight purple gloss, both wings with blackish discal lunule, curved, minutely crenulate postmedial line and pale subterminal spots between the veins, slightly dark-edged on proximal side.

Mt. Poi, 5200 feet—1 ♂; 4500 feet—2 ♂; 4300 feet 1 ♂ holotype. Also a rather poor ♂ from Mt. Murud, November, without exact elevation.

Lusemelia iodes Roths., Journ. Fed. Malay St. Mus., viii, p. 125, 1920, Sumatra, appears to belong to this genus.

96. ADRAPSA ABLUALIS Wlkr.

Adrapsa ablualis Wlkr., Spec. Lep. Ins., xvi, p. 170, 1858, Ceylon.

Lio Matu, December—1 ♀.

Before me from Ceylon and Sarawak. There is at present insufficient material to hand for a definite decision as to racial agreement or distinction, but the ♀ from the two localities appear much alike.

97. *ADRAPSA MARMOREA* Swinh.

Oxanamus marmorea Swinh., A.M.N.H. (7) x, p. 503, 1903, Kina Balu.

Mt. Murud collection—1 ♂ without exact data; Mt. Penrissen, 2000 feet—1 ♀.

Known to me from the Malayan subregion only.

98. *ADRAPSA GEOMETROIDES* Wlkr.

Lusia geometroides Wlkr., Spec. Lep. Ins., xiii, p. 1113, 1857, Ceylon.

Mt. Poi, 2000 feet—1 ♂; Mt. Penrissen, 2000 feet—1 ♂.

The Mt. Penrissen ♂ belongs to a dark aberration, not uncommon in the Malayan subregion, in which the ground-colour is somewhat more fuscous than in the typical form and the white lines on the hind wing are reduced to a single postmedial and subterminal. It is just possible that this is really a distinct species, but it seems to agree perfectly in structure with *geometroides*. In the Joicey collection from Ceylon, India, Malay Peninsula, Borneo, New Guinea, Goodenough, and Sudest Is.

99. *ADAPSA INSOLIDA* sp. n.

♀ 38--41 mm.

Antenna minutely serrate on distal third, clothed with fine short bristles and extremely short cilia. Palpus with segment 2 well over twice diameter of eye, moderately scaled in front, slightly thickened with scales on proximal half behind; segment 3 acuminate, fully two-thirds length of 2. Coloration somewhat as in *geometroides* but slightly more fuscous in tone. Markings somewhat as in the dark aberration of *geometroides*, but fore wing with discal spot more elongate, scarcely or very narrowly white-marked; postmedial line single, strongly bent outward and dentate on veins R^2 to M^1 and on SM^2 ; subterminal almost equally well-defined throughout, somewhat more strongly bent outward behind SC^5 and R^2 than in *geometroides*; terminal white patch reduced to a dot between SC^4 and SC^5 . *Hind wing* with the termen more bent at M^1 than in *geometroides*, with the lines also slightly more bent at middle. *Underside* somewhat as above but with discal lunules on both wings more broadly white; fore wing with posterior half of subterminal line weaker.

Mt. Murud, 6000--6500 feet, October—(type), 24, November—4 ♀.

In the absence of the ♂, it is impossible to decide the exact position of this species, but it may well prove nearly related to *geometroides*. Possibly, however, nearer to *A. albirenalis* Moore, from Sikkim, which is unfortunately not before me for comparison.

100. *ADRAPSA ANGULILINEA* sp. n.

♂, ♀, 30 mm.

♂ antenna unipectinate to about $\frac{3}{4}$, the shaft not swelled or contorted; ♀ nearly simple, with very short cilia. ♂ palpus with segment 3 triangularly tufted with scales before and behind; segment 2 straight, erect, with a tuft of scales on discal half behind, the scaling in front long on proximal two-thirds and at distal end (may be worn away between). ♀ palpus much as in the last species, but with segment 2 shorter (scarcely twice diameter of eye); segment 3 almost as long as 2. ♂ fore wing without distinct costal fold but with fringe of long hair on proximal $\frac{1}{6}$.

♂, ♀. Body and wings above drab, the fore wing tinged with wood-brown; wings with a rounded white cell-spot, the termen of fore wing from apex to behind R^2 paler, tinged with ochraceous, with a dark spot at apex. Fore wing with slight, dark, nearly erect ante- and postmedial lines, the postmedial bent outward from an oblique pale spot at $\frac{3}{5}$ costa, slightly undulating to R^3 , where it is sharply angled, somewhat incurved and undulating to $\frac{2}{3}$ hind margin: subterminal very weak except against the pale area; termen with dark lunules. *Hind wing* with a straight, diffused, dark medial line, touching the discal spot, and an outstandingly dark diffused shade on proximal side of postmedial, which is waved, strongly bent outward and dentate between R^2 and M^1 ; subterminal slight, waved. Wings *beneath* nearly as above but a little paler, with the postmedial dark shade equally strong on both wings, less broadly diffused on the hind wing than above: the apical dark spot on fore wing very sharply defined.

Mt. Poi, 200 feet—1 ♂; Mt. Penrissen, 2000 feet—1 ♀.

The exceptionally long stalking of SC^2 with SC^3 -- SC^4 in *angulilinea* places it somewhat apart from the majority of *Adrapsa* species, but in other respects it seems so clearly

to belong here that I have had no hesitation in placing it in *Adrapsa*. The short cell of hind wing and the ♂ palpus are extremely characteristic of the genus, and, although the fore leg is somewhat damaged, it appears to be without the sheath of *Simplicia* and *Nodaria*.

101. *BOCANA MANIFESTALIS* Wlkr.

Bocana manifestalis Wlkr., Spec. Lep. Ins., xvi, p. 171, 1858, Ceylon.

Pah Trap, November—1 ♀; Mt. Dulit, 3000 feet—2 ♀; Mt. Penrissen, 2000 and 4000 feet—2 ♀.

Widely distributed throughout the Indo-Australian region. One of the Mt. Dulit ♀ is exceptionally large, but it appears to belong here; the Pah Trap ♀ and the Mt. Penrissen one from 4000 feet belong to the non-typical form, without distinct white on discal spot of fore wing.

102. *BOCANA INCOMPLETA* sp. n.

♂, 40--42 mm.

Nearly agrees in structure with *manifestalis*, from which it differs in the following points. Size rather larger: antennal pectinations replaced at the distal end by bristles (extending practically to end in *manifestalis*); segment 2 of palpus hardly thickened at middle behind (distinctly thickened in *manifestalis*); costa a little larger. Wings above with the markings very weak; postmedial shade nearly erect (but twice excurved) from costa to R², thence incurved; subterminal shade about as in a weakly marked specimen of *manifestalis*. Hind wing paler and greyer than the fore wing, with faint traces of postmedial and subterminal shades. Wings beneath very pale grey, somewhat darkened distally and at costa of fore wing; markings present but weak, the lines on hind wing less waved than in *manifestalis*. The Mt. Poi specimen is slightly blacker in tone than the type.

Mt. Murud, November, without exact elevation—1 ♂; Mt. Poi, 4500 feet—1 ♂.

103. *BOCANA SILENUSALIS* Wlkr.

Asthalia silenusalis Wlkr., Spec. Lep. Ins., xvi, p. 129, 1858, Sarawak.

Mt. Penrissen, 3500 feet—1 ♀.

A somewhat melanic aberration, but not appearing otherwise to differ from the type. *Silenusalis* is represented in the Joicey collection from Khasias, Malay Peninsula and Sarawak.

Although the genus *Bocana* is separated from *Adrapsa* chiefly by a secondary sexual character, the presence (in *Bocana*) or absence (*Adrapsa*), of a large fold on and behind costa of ♂ fore wing beneath, it has seemed well to preserve this well-known name provisionally, especially as these sexual characters seem often more fundamental in the *Hypeninae* than in many of the other *Noctuid* subfamilies.

104. *HYDRILLODES TORESALIS* Wlkr.

Bleptina toresalis Wlkr., Spec. Lep. Ins., xix, p. 875, 1859, Sarawak.

Mt. Murud, November, without exact elevation—1 ♂, 3 ♀. Also a ♂ and ♀ from the same collection with the data wanting.

Although the type of *toresalis* is a ♀, the quadrate scaling on segment 2 of palpus, as well as the fact that similar ♂ and ♀ occur together in various parts of the Indo-Australian region (India, Malay Peninsula, Ceram, New Guinea, etc.) make it almost certain that the sexes are correctly paired. Sir G. Hampson, in his "Moths of India" and in Coll. Brit. Mus. has sunk this species to *abavalis* Wlkr. (*Echana abavalis*), from Ceylon, but the two are in reality quite distinct, at once separable by the smaller size and darker coloration of *abavalis*, as well as by the neuration; in *abavalis* SC^2 is more or less parallel with SC^{3-4} , well removed from SC^1 ; in *toresalis* ♂ SC^2 is parallel with SC^1 , somewhat remote from SC^{3-4} .

105. *HYDRILLODES PTEROTA* sp. n.

♂, ♀, 23--26 mm.

♂. Antenna subserrate, with bristles nearly twice diameter of shaft and shorter ciliation. Palpus sickle-shaped, with segment 2 strongly curved, nearly twice diameter of eye, shortly scaled in front; segment 3 long (about three-quarters of 2), with rather long scaling behind, tapering to a point. Fore wing rather short and broad, the proximal half of costa above thickened and bearing a dense tuft of long, down-curved scales, which are very easily disarranged, giving to the proximal half of wing a very unusual appearance. This

tuft is followed by a short, deep fold, which is darker than the rest of the wing—probably filled with dense black hair.

Head, thorax and *fore wing* above buff-brown, the latter irregularly dark-banded at middle; a dark spot in the fold near base, followed by an indistinct, slightly curved antemedial (?) line; a very indistinct medial line, forming the proximal boundary of the dark shade; postmedial line almost obsolete; subterminal pale (bordering the dark shade), wavy and minutely dentate, strongly bent outward before R^1 and behind R^2 ; costa with two or three large, bright ochraceous spots; terminal black spots very distinct. *Hind wing* brownish-fuscous, paler at base, with a slight dark discal lunule and traces of postmedial and subterminal lines. *Underside* buff-brown; the hind wing whiter except towards termen, with large dark discal spot and minutely dentate postmedial and subterminal lines; fore wing with traces of a pale subterminal line on the anterior half.

♀. A normal *Hydrillodes* ♀; fore wing with the distal third very dark, the proximal two-thirds of wing with some strongly contrasting pale shades but unusually suffused with fuscous; generally with a large dark discal spot. Hind wing and underside as in the ♂.

Mt. Dulit, 3000 feet—1 ♂; Perak, 2000--3500 feet (W. Doherty)—5 ♂, 1 ♀; Kedah Peak 3200 feet, December, 1915—2 ♂, 4 ♀. The last named specimens have been submitted to us by the Raffles Museum, by whose generosity half the specimens will become the property of Mr. J. J. Joicey. A ♀ from Mt. Penrissen, 4400 feet, is placed here provisionally.

On account of the great difficulty of this group and the frequency of racial variation it has seemed wiser to select one of the five Perak ♂ as the type, rather than the single ♂ from Mt. Dulit.

106. HYDRILLODES POIENSIS sp. n.

♂, 26 mm.; ♀, 22--24 mm.

♂. Structure about as in *pterota*, but *fore wing* much darker, more purplish-fuscous. *Hind wing* slightly greyer in tone, with a rather better-developed postmedial line, which is further removed from the discal spot than in *pterota*; the difference in this line is even more marked beneath, where,

also, the subterminal is almost obsolete and the discal spot is narrower, more lunular. The pale subterminal entirely wanting on fore wing beneath, where both wings are darker and much greyer in tone than in *pterota*.

♀. Differs from *pterota* ♀ very much as the ♂ differs from the ♂, the fore wing above being often almost entirely suffused with purplish-fuscous.

Mt. Poi, 5200 feet—1 ♂, 4500 feet—3 ♀, 4400 feet—1 ♀.

It is possible that *poiensis* is only an aberration or race of *pterota*, but it seems sufficiently distinct to be deserving of specific rank.

107. HYDRILLODES MURUDENSIS sp. n.

♂, 28 mm.; ♀ 25--30 mm.

♂. Very nearly agrees in structure with the last two species, but SC^5 is more definitely stalked with $SC^{3,4}$ and is distinctly down-curved at middle (evenly curved throughout in the other two species). The fore wing above is coloured very much as in *pterota* but seems less banded with fuscous; hind wing distinctly paler than in either of the other two species, with postmedial line somewhat as in *poiensis*, but rather nearer to the discal spot. Underside somewhat intermediate; nearly the colour of *pterota*, but less sharply marked and without the pale subterminal line.

♀. Very near to the ♀ of *pterota*, but fore wing with the discal spot even larger and blacker, followed distally by a conspicuous rounded pale spot; postmedial line rather more sharply angled.

Mt. Murud, without exact data—1 ♂, 1 ♀; summit, 7200 feet, November—1 ♀; 6500 feet, November—5 ♀; 6000--6500 feet, October—4 ♀, November—2 ♀; without exact elevation, November—4 ♀.

Another possible aberration or race, but the differences seem sufficient to be regarded as specific.

108. HYDRILLODES MINOR sp. n.

♂, ♀, 21--22 mm.

♂. Palpus with the scaling evenly rounded in front. Antenna semiserrate, with curved bristles two or three times diameter of shaft and shorter ciliation. Fore tibia with rather long, dense, woolly hair, the tarsus glabrous. Fore wing with a highly raised fold at middle, somewhat as in

abavalis, (*Echana abavalis* Wlkr., Spec. Lep. Ins., xvi, p. 196, 1856, Ceylon) but smaller, though quite as highly raised (filled with very dense hair?) and forming a more distinct swelling at costa. Vein SC^1 abnormally close to SC^2 SC^5 abnormally close to SC^{3-4} , the two pairs of veins widely separated by the fold which is almost as strongly swelled beneath as above. Coloration appears more or less as in *abavalis* (condition is not good), the lines almost obsolete, a slight, waved, dark subterminal the least indistinct. *Hind wing* pale fuscous-brown with faint indications of a discal spot and of curved postmedial and subterminal lines, which are more distinct beneath, where the ground colour is whiter. Fore wing beneath nearly uniform drab-brown, the fold more ochraceous white towards costa.

♀. Much like a small *lentalis* ♀, Delt. et Pyr., p. 66, 1854, Central India, the hind wing slightly narrower and with more dark irroration than in Ceylon and Indian ♀ of *lentalis*. This cannot be regarded as a certainly correct pairing, the ♀ in this genus so strongly resembling one another.

Mt. Murud, 7200 feet (summit) November—1 ♂; without elevation, November—1 ♀; Mt. Dulit, 3000 feet—1 ♂. Also in Coll. Joicey from Perak, 2000--2500 feet (W. Doherty)—2 ♂, 1 ♀, and in Coll. Brit. Mus. from Sarawak, 4 ♂ and a (doubtful) ♀, and from Singapore, 3 ♂ placed over a blank label.

Some specimens from Singapore and Perak seem a trifle broader winged and paler in tone than Sarawak ones and may prove distinct, but the difference may well be merely aberrational.

109. HYDRILLODES EUCAULA sp. n.

♂, 32 mm.

Costa of fore wing above with small, somewhat flattened fold just beyond middle, preceded on proximal side by a narrow flap edged with short, dense, down-turned scales; SC^1 given off almost opposite to or slightly before R^1 , very close to SC^2 ; SC^5 stalked with $SC^{3,4}$, to nearly one-third. Palpus normal (rounded in front). Antenna subserrate, with bristles and ciliation about twice diameter of shaft.

Fore wing dark purplish-fuscous with a row of subterminal white spots on the veins; other markings almost obsolete. Head and thorax (as usual) matching fore wing; palpus bright buff in front and on inner side. Abdomen and *hind wing* greyish-fuscous, the latter paler on proximal two-thirds, whitish at base; the discal spot, veins and terminal lunules darker. *Underside* somewhat as above but both wings paler, the hind wing with a sharply defined discal spot and with pale, wavy, proximally dark bordered medial and postmedial lines.

♀, 27--32 mm.

Fore wing without the costal fold and fringe of scales; neuration normal, with SC⁵ given off just before SC². A pale spot on costa at origin of postmedial line, which is sometimes very faintly indicated throughout (curved); a dark discal spot usually just discernible. *Hind wing* and *underside* much as in the ♂.

Mt. Murud, 6000--6500 feet, October—1 ♂; 6500 feet, November—1 ♀; without exact elevation, November—1 ♀. Also 2 ♀ from Mt. Poi (5200 feet and 4400 feet), and 1 ♀ from Mt. Penrissen, 3500 feet.

A narrower-winged insect and more uniform purplish-fuscous in tone than the majority of *Hydrillodes* species; perhaps nearest to *funestalis*, (*Bleptina funestalis* Wlkr., Spec. Lep. Ins., xxiv, p. 1163, 1865, Moreton Bay.) But remarkable in the ♂ for the stalking of SC⁵ with SC^{3,4}.

110. HYDRILLODES GRAVATALIS Wlkr.

Bocana gravatalis Wlkr., Spec. Lep. Ins., xvi, p. 175, 1858, Ceylon.

Mt. Murud, November—1 ♀; Mt. Penrissen, 3500 feet—1 ♀.

The Sarawak form (*erythusalis* Wlkr.) does not appear to me to differ racially from *gravatalis* from Ceylon. Only known to me from these two localities and (in Coll. Brit. Mus.) from Travancore.

111. HYDRILLODES PERTRUNCATA sp. n.

♂, 32--35 mm.

Palpus sickle-shaped; segment 1 rather longer than the normal; segment 2 strongly curved, shortly and evenly scaled, fully $1\frac{1}{2}$ diameter of eye; segment 3 acute, with very slight hair before and behind, more than twice length of 2.

Antenna weakly serrate, with long curved bristles. *Fore wing* broad, strongly truncate at apex, with termen and hind margin both well rounded, costa with a very narrow fold ending at the truncation of apex; almost uniform fuscous-brown, the scales easily removed, leaving irregular whitish spots and patches. *Hind wing* whitish tinged with pinkish-brown (especially towards termen), with indistinct discal spot and a very weak, curved postmedial line placed very near to the disc; a slight dark terminal line. *Underside* of fore wing much paler than above with slight discal lunule; hind wing somewhat more strongly darkened than above, with darker discal spot.

Mt. Murud, 6500 feet, November—4 ♂; 6000-6500 feet, November—2 ♂.

After earnest consideration it has seemed to me possible to place this species in *Hydrillodes*, on the strength of the general similarity (except in breadth and shape of fore wing) and the fact that $SC^{3,4}$ of fore wing appear to be coincident throughout. *Pertruncata* should however belong at least to a distinct subgenus, characterised by the broader fore wing and especially, by having M^1 from the cell, not stalked, and $R^2.R^3$ only very shortly stalked instead of on a long stalk as, in typical *Hydrillodes*.

112. Genus ECHANELLA Beth. Bak.

This genus is near to *Hydrillodes* but is at once separable on the following characters. Palpus, head and thorax with a strong metallic purplish gloss on the scaling, the metathorax with a small metallic crest. ♂ fore wing with SC^3 , SC^4 stalked (not coincident); ♂ antenna with the shaft distorted at about $2/5$. Fore wing in both sexes with M^1 from the cell (not stalked with $R^2.R^3$), R^2 , R^3 typically from cell, stalked in one section (subgenus?) hind wing with long anastomosis to or to just beyond middle of cell.

Type: *Adrapsa albibasalis* Holl. (♀) Nov. Zool., vii, p. 572, 1900, Buru.

= *Nodaria rugosa* Holl. (♂) Zool., vii, p. 575, 1900, Buru.

= *Hydrillodes funerea* Beth. Bak. (♀) Nov. Zool., xv, p. 214, 1908, Br. N. Guinea.

= *Echanelle purpurea* Beth. Bak. (♂) Nov. Zool., xv, p. 216, 1908, Br. N. Guinea.

We are indebted to the kindness of Mr. Bethune Baker for the loan of the types of *purpurea* and *funerea*, which has made possible the above study in nomenclature and synonymy. As I have not had access to any ♂ from Buru or from any of the Moluccas, it is impossible to say whether there is any racial difference between Moluccan and New Guinea specimens, but, judging from the usual variability of the *Hypeninae*, such a difference is quite likely to exist, in which case the New Guinea form would stand as *albibasalis funerea* Beth. Bak.

112. ECHANELLA TEMPERATA sp. n.

♂, ♀, 33--36 mm.

♂ antenna and palpus much as in *albibasalis* Holl.; vertex of head whitish; thorax and abdomen about as in *albibasalis*. Fore wing without costal fold or hair tuft, cinnamon buff more or less irrorated with warm sepia to just beyond postmedial line; distal third of wing warm sepia crossed by the buff subterminal line and by a slight horizontal buff streak about SC⁵; a subbasal dark mark at costa; a waved dark antemedial line bent outward to fold, strongly angled inward on SM²; a broad oblique black discal lunule; postmedial line waved, black, oblique to M¹ but angled inward at cell, inwardly oblique to hind margin and strongly angled inward on fold; subterminal line nearly as in *albibasalis*. Hind wing slightly paler than in *albibasalis* towards apex and at termen, but the rest of the wing more strongly darkened, the posterior third clothed with short blackish androconial hair. Underside of fore wing somewhat bleached-looking, with slight, oblique, distal lunules and obliquely curved postmedial line; these lines are only very weakly indicated above.

♀. Nearly as in *albibasalis* ♀, but with the pale basal patch and subterminal line deeper buff in tone and with rather a stronger postmedial line.

Sumatra: Barison Range, Western slopes, 2500 feet. October to November, 1921 (C., F. & J. Pratt)—2 ♂: Medan, February (Coll. Le Moulton)—1 ♀. Also 2 ♀ in the Mjöberg collections from Mt. Dulit, 3000 feet. Coll. Brit. Mus. has an unnamed ♀ from Borneo which probably belongs here.

In neuration of fore wing this species differs from *albibasalis* in the following points:—SC¹ from close to angle of cell; SC² rather more shortly stalked with SC³.SC⁴; R¹ from angle of cell; R² and R³ minutely stalked. ♀ neuration practically as in the ♂.

It is just possible that when more material is available Borneo specimens may be found to differ racially from Sumatra ones.

113. *ECHANELLA OBLIQUISTRIGA* sp. n.

♂, ♀, 32-37 mm.

♂. Antenna nearly typical but with slightly longer tuft of hair. Palpus with segment 1 greatly produced (at least $1\frac{1}{2}$ diameter of eye), upcurved in front of face; segments 2 and 3 recurved over head and thorax, reaching to near middle of abdomen, both very slightly down-curved, 2 with a small erect tuft of hair at its proximal end and a similar larger tuft at the junction of 2 with 3, the latter anteriorly blackish posteriorly whitish; segment 3 slightly longer than 2, whitish except at distal end (which is clothed with metallic purple scales) and with a tuft of long whitish hair on its inner side. *Fore wing* slightly broader than in *albibasalis*, with very narrow fold at middle of costa and narrow oblique tuft of down-turned hair across disc to just behind angle of cell; coloration much as in *temperata*, but the buff shades a little brighter and more irregular, almost confined to the base of wing and to a broad horizontal bar in distal end of cell and a lunule from $\frac{5}{6}$ costa to termen behind SC⁵, where it meets a broader bar to the lower angle of cell; a slight antemedial bar on costa and weak traces of postmedial and subterminal lines behind the broad bar from termen to cell. *Hind wing* nearly uniform pale fuscous-brown, a little paler towards base, with obsolescent discal spot. *Underside* pale fuscous-brown, paler on proximal third of hind wing, which has a distinct dark spot on anterior half of discocellular 2 and diffused postmedial and subterminal dark bands, both excurved round cell and angled inward of fold; fore wing with large rounded pale spot at about one-third costa.

♀. Similar to the ♀ of *temperata* but with the buff shades rather darker (less contrasted); postmedial line of

fore wing less distinct, except round the cell, where it is broadened and nearly confluent with a broad, cinnamon discal lunule. Hind wing and underside slightly darker than in the ♂, the latter without the pale spot on costa of fore wing.

Mt. Murud, 6000--6500 feet, October—1 ♂, 6 ♀; 6500 feet, November—1 ♀; November—1 ♀, without data (or illegible)—3 ♀.

Differs in neuration both from *albibasalis* and *temperata* in the long stalking of R². R³ of fore wing, which in the ♂ is nearly as in a typical *Hydrillodes* and is quite strong in the ♀; in both sexes SC¹ is given off somewhat earlier; R¹ normal. On account of the palpus and the long stalking of R². R³ this and another (undescribed) species should be regarded as belonging to a distinct section or subgenus of *Echaneella*, but for the present, at least, they may well be regarded as congeneric, the two groups having much in common.

114. HYPENA HERPA Swinh.

Bomolocha herpa Swinh., A.M.N.H. (7) viii, p. 20, 1901, Andamans.

Mt. Murud, 6000--6500 feet, November—1 ♂; November—1 ♀.

In "Moths of India," vol. iii, and in Coll. Brit. Mus., this species is sunk to *iconicalis* Wlkr. (Ceylon). As the genus *Hypena* is at present unworked in the Joicey collection I cannot offer any definite opinion as to whether this sinking is correct; nor is it at all certain whether Sarawak specimens agree perfectly with specimens from Andamans; but as the Mt. Murud specimens seem nearer to *herpa* than to either of the other types placed by Hampson under *iconicalis* it has seemed best to employ that name. Hampson gives India, Ceylon, Burma, Java, Sula and Mysol as localities for *iconicalis*.

115. HYPENA JUGALIS Wlkr.

Hypena jugalis Wlkr., Spec. Lep. Ins., xvi, p. 63, 1858, Sarawak.

Mt. Poi, 200 feet—1 ♀.

This species does not seem to have been recorded from any other locality than Sarawak. Quite interesting.

116. *HYPENA LAESALIS* Wlkr. (?)

Hypena laesalis Wlkr., Spec. Lep. Ins., xvi, p. 62, 1858, Hindostan.

Mt. Murud, 6000--6500 feet, October—1 ♂.

In "Moths of India" this species is sunk to *H. indicatalis* Wlkr. (Ceylon). It is quoted as occurring also in Natal, Japan, Burma, Borneo, Java, Celebes. The genus *Hypena* is in such confusion in the National Collection as well as in the Joicey collection, and there are so many species somewhat of this type that this cannot be regarded as a certain identification, although the above ♂ is in quite good condition.

117. *HYPENA BREVICELLA* sp. n.

♂, 36 mm.

Very nearly agrees with some forms of *H. longipennis* Wlkr., Spec. Lep. Ins., xxxiv, p. 1139, 1865, Darjeeling, but has the distal third of wing from behind R^1 and obliquely from apex to postmedial line dark purple-drab, interrupted by whitish, proximally black-dotted subterminal spots between the veins; proximal two-thirds of wing and costa to apex light buff, shaded with tawny and grained with purple-drab, leaving a slight, pale, oblique postmedial line from R^1 to three-fifths hind margin and a strong, light buff subapical streak defining the dark border: a blackish patch of raised scales in cell at about $3/5$ and a similar, rather larger patch behind M, distally oblique from the patch in cell; slight pale raised hair on discocellular 2, tipped with blackish at lower angle of cell. *Hind wing* and underside almost uniform fuscous-brown.

Mt. Murud, November—1 ♂.

In addition to the points given above, *brevicella* differs from *longipennis* in the shape of fore wing, which has the costa appreciably swelled at about one-third and the termen somewhat less oblique than in *longipennis*. Differs also in the neuration of hind wing, where the cell is distinctly shorter (hardly $3/8$ of wing in *brevicella*; $2/5$ in *longipennis* and the interspaces between R^1 and M^1 (especially between R^3 and M^1) are distinctly larger than the interspace between SC^2 and R^1 ; in specimens of *longipennis* from India, China and Formosa the interspaces are about equal in breadth throughout.

118. *HYPENA* species.

Pah Trap, November—1 ♂.

Too poor to determine. It is not even possible to judge whether this is likely to belong to a new species.

119. *NAARDA NODARIODES* sp. n.

In coloration this species closely resembles a purplish specimen of *Nodaria externalis*, but the abdomen and hind wing are much darker than in that species, much more resembling the thorax and fore wing. *Nodariodes* is also at once distinguishable by the porrect or almost drooping palpus, with the second segment thickened with scales above (broadly at proximal end). *Fore wing* with a fairly distinct, slightly oblique, waved antemedial line from 2/7 costa to $\frac{1}{3}$ hind margin; a slight, diffused tawny medial shade with a slight pale reniform (anteriorly and posteriorly dark-dotted) on its distal edge; a fine dark postmedial line, a little bent outward from about two-thirds costa to SC^5 , from whence it is minutely dentate and slightly oblique to $\frac{2}{3}$ hind margin, but a little bent outward from R^2 to M^1 ; subterminal line pale, angled inward before R^1 and incurved before hind margin, excurved before and behind the angle. *Hind wing* with obscure medial and postmedial lines and pale subterminal, as on fore wing. *Underside* paler and rather greyer; fore wing with slightly curved postmedial line; hind wing with discal spot (on faint medial shade) and slight, diffused dark postmedial and subterminal shades.

Mt. Poi, 5200 feet—1 ♀ Also a very worn ♀, which may probably belong here, from the same mountain, 4500 feet.

In his "Moths of India," Sir G. Hampson sinks *Naarda* to *Hypena*, but the two genera seem to me abundantly distinct. In *Naarda* the hind wing is much less ample than in *Hypena* and more or less reproduces the pattern of fore wing; in *Hypena* it is very ample and practically unmarked. In *Naarda* the cell of both wings is rather shorter than in typical *Hypena* species. In the ♂, *Naarda* also differs typically in the presence of a moderate-sized fold on costa of fore wing beneath. As already stated in this paper, these costal folds seem a somewhat fundamental structure in the *Hypeninae*; though as *nodariodes* is only known in the ♀, it is of course impossible to speak with certainty as to the presence of the fold.

120. NAARDA species.

Mt. Murud, 6000--6500 feet, November—1 ♀.

Smaller and quite different in shape from *nodariodes*. Perhaps nearer to *symethusalis* Wlkr., but quite too poor for determination.

121. PROLOPHOTA MJÖBERGI sp. n.

♂, 19 mm.

Shape nearly as in *P. trigonifera* Hmps., Moth Ind., vol. iv, p. 547, 1896, Ceylon, but hind wing narrower, more strongly dentate between R^3 and tornus, especially deeply cleft at the fold. Body almost white, the palpus buff with the scaling edged with fuscous. Wings strongly tinged with light greyish vinaceous (Ridgway, pl. xxxix), especially on distal half; markings vague, except the large triangular subterminal patch at costa and smaller triangular patch at origin of postmedial line on fore wing and the black discal dots on both wings, which are about as in *trigonifera*; medial line as weak as the antemedial; reniform, orbicular and lines otherwise much as in *trigonifera*, the postmedial on hind wing with black dots on veins R^2 , M^1 , M^2 and SM^2 . Underside of fore wing tinged with buff on the proximal half, with greyish vinaceous on distal half; markings weak, about as in *trigonifera*. Hind wing whiter, with moderately well-defined discal spot (with dark spot before it on costa) and curved postmedial line.

Mt. Murud collection, exact data unfortunately lost—1 ♂.

This may possibly belong to a new genus very closely related to *Prolophota*, from which it differs in having the cell of fore wing appreciably longer, the cell of hind wing distinctly shorter, and, especially, in having SC^2 and SC^3 both free from the cell; in *P. trigonifera* SC^2 is well-stalked with $SC^3.SC^4$. By Sir G. Hampson's system this last point must at once constitute a generic division; but, although the division of genera on the subcostals holds good in the majority of *Hypenid* genera, it is certainly not infallible (see *Simplicia* and *Adrapsa*) and as *mjöbergi* agrees so well in most respects with *Prolophota*, I place it provisionally in that genus.

SUPPLEMENT.

As the collections from Mts. Murud, Dulit, Poi and Penrissen had been worked out and largely written up before the collection from Mt. Matang reached us, the six species of *Noctuidae* belonging to that collection are included in this paper as a supplement instead of being incorporated in the text. Although only 6 species (13 specimens) were received from Mt. Matang 4 of the species (10 specimens) are apparently hitherto undescribed. All but one belong to the subfamilies published in Sarawak Museum Journal 3.

ACONTIANAE.

122. CAREA FUSCOSA sp. n.

♂, 34--37 mm.

Very near to *C. moira* Swinh., Ann. Mag. Hist. (6) xii, p. 262, 1893, Selangor, but the fore wing is mikado-brown (Ridgway, pl. xxix), largely suffused, except at termen, with vinaceous russet (l.c. pl. xxviii) and tinged with chocolate, especially near base of wing; postmedial line distinctly bent inward in cell; subterminal hardly excurved at middle. Differs from *moira* chiefly on the hind wing, which in *fuscosa* is almost entirely suffused with fuscous except at costa and on distal third or fourth of wing to about M^2 , the terminal shade being more testaceous (less orange-red) than in *moira*. Wings beneath nearly uniform testaceous, with the exception of the fringe, costa and hind margin of fore wing and the fringe and a very narrow fuscous area at hind margin of hind wing; fore wing a very rich, deep shade of testaceous; both wings with traces of a dark discal lunule.

Mt. Matang (Dr. E. Mjöberg)—7 ♂.

It is just possible that this really a dark mountain race of *moira*; but as more or less normal forms of *moira* are known from Borneo and as the species in this genus are so confusingly close to one another, it has seemed safer to regard *fuscosa* as specifically distinct unless (or until) any evidence is found to the contrary.

123. *CAREA OBLIQUIFASCIA* sp. n.

♂, 32--36 mm.

Head and thorax predominantly dark Indian red (Ridgway, pl. xxvii); palpus, pectus, abdomen beneath and legs maize yellow (l.c. pl. iv), shaded with deeper buff and irrorated here and there (especially on fore tibia) with Indian red; abdomen above brownish-fuscous, the anal tuft buff. Fore wing ochraceous-salmon (pl. xv) largely suffused with dark Indian red, but the salmon ground-colour persisting at base of hind margin, on the moderately large (irregularly rounded) reniform and in a broad terminal area from costa close to apex to a little beyond middle of hind margin; this latter area is, however, interrupted by the posterior half of post-medial line, by the diffused subterminal shade and by a slight dark shade at termen, which is broadest on its anterior half but arises from a point at apex; lines very diffused and indistinct, the antemedial almost obsolete (lost in the dark shade on this part of wing); the postmedial only distinct behind M, where it almost follows the line of termen; the subterminal shade angled outward behind SC⁵ and inward behind R¹, otherwise more or less straight and erect. *Hind wing* with anterior three-fifths proximally cream-coloured, distally shaded with salmon colour; the posterior two-fifths tinged with brownish-fuscous. *Wings beneath* whitish shaded with light ochraceous-buff (l.c. pl. xv), the anterior half of fore wing and termen of hind wing (except towards tornus) shaded with salmon colour.

Mt. Matang (Dr. E. Mjöberg)—1 ♂. There are also before me, in the Joicey collection, 3 ♂ from Perak, 2000--5000 feet (W. Doherty).

2 ♂ and 1 ♀ (exactly agreeing with the ♂) from Kedah peak, 3200 feet, December, 1915, presented to the Joicey collection by the Raffles Museum, appear somewhat darker on both wings, with the salmon shades a more decided red, but they seem to belong here.

Unfortunately not one of the 7 specimens is in really first-rate condition. The type is rather smaller than the others. Apparently nearest to *C. carneiplagata* Warr., Nov. Zool., xix, p. 41, 1912, Penang, but the figure of this species which is before me has the dark and pale areas of

fore wing differently arranged, the pale shade about the veniform being greatly increased, the termen more solidly darkened than in *obliquifascia*.

124. MACEDA MANSUETA Wlkr.

Maceda mansueta Wlkr., Spec. Lep. Ins., xiii, p. 1141, 1857, Sarawak.

1 ♂, 1 ♀.

Known throughout the Indo-Australian region from Ceylon to Queensland and New Guinea.

CATOCALINAE.

125. LAGOPTERA OCHROBRUNNEA Strand.

Lagoptera ochrobrunnea Strand, Arch. Nat., 79a 8, p. 71, 1914, Penang.

A distinctively Malayan species, but with a race occurring in New Guinea.

OPHIDERINAE.

126. ANOMIS EUERES sp. n.

♂, 39 mm.

Antenna almost simple. Fore wing strongly angled at apex and R^3 , somewhat so at M^1 .

Head and patagia xanthine orange (Ridgway, pl. iii), thorax largely overlaid with mahogany red (l.c. pl. ii); segment 2 of palpus outwardly a mixture of orange and mahogany red, inwardly white, segment 3 fuscous mixed with a little white; pectus and legs whitish, the tarsi with the usual broad fuscous banding, fore femur and tibia tinged in front with pale red; abdomen above fuscous-brown with the crests mahogany, beneath proximally whitish, distally fuscous. Fore wing with the proximal half (except near base) almost entirely overlaid with mahogany red; the distal half duller in tone, the underlying orange appearing to be absent or much paler; an orange patch at base from costa to M and a very sharply defined orange spot in fold half way to the antemedial line, which is blackish, bent outward from two-sevenths costa to SC, erect in cell, strongly angled outward at origin of M^2 and inward to before SM^2 , excurved to fully one-third hind margin; orbicular and reniform silvery-grey, dark-outlined, the former small, round, the

latter erect, proximally incurved, distally strongly angled inward at middle (nearly divided in two), with a dark spot in middle of each division; postmedial line silvery-grey, proximally dark-edged, distally accompanied by a second silvery line as far as M, from three-fifths costa, strongly angled outward at SC¹, oblique from SC⁵ to R², slightly angled out to R³, thence incurved and crenulate to two-thirds hind margin; subterminal silvery-grey, crenulate and incurved from near apex to M¹, where it almost fades out in a diffused dark spot; fringe slightly darker than wing. *Hind wing* brownish-fuscous; the base and fringe somewhat paler. *Underside* of fore wing pale fuscous-brown, of hind wing more buff; costa of fore wing and termen of hind wing irrorated with pale silvery-grey; both wings with slight postmedial line; fore wing also with weak subterminal shade and with the fringe darkened.

Mt. Matang (Dr. E. Mjöberg)—1 ♂. A single ♂ in the Joicey collection from S.W. Sumatra, slopes of Mt. Korintji, 7300 feet, August-September, 1921 (C., F. & J. Pratt) clearly belongs to this species, though the thorax and proximal half of fore wing are rather more orange in tone, less strongly overlaid with mahogany.

HYPENINAE.

127. SIMPLICIA ERIODES sp. n.

♂, 45 mm.

Antenna with shaft normal and very short ciliation.

Head, thorax and fore wing avellaneous (Ridgway, pl. xl), slightly tinged with ochraceous buff, especially on the thorax; hind wing, abdomen above, body and wings beneath somewhat similar in colour, but a little paler and more tinged with fuscous-brown, especially on proximal half of fore wing. *Both wings* above with a rather weak, pale yellow subterminal line, which on the fore wing is very weakly excurved on anterior half and incurved on posterior, on the hind wing it is hardly angled at M² and runs to the termen before tornus; the veins slightly streaked with pale yellow before termen. *Fore wing* with a small but very black cell dot, the lines (except subterminal) almost entirely concealed by the short, woolly androconia, which covers the whole wing from base to terminal line.

Mt. Matang (Dr. E. Mjöberg)—1 ♂. There is also before me a single ♂, belonging to the Tring Collection, from Penang, November, 1897 (Curtis), which seems to match almost perfectly with the above.

The woolly androconia on the fore wing makes *eriodes* very distinct from all other *Simplicia* species. In *turpatalis* Wlkr., Spec. Lep. Ins., xvi, p. 174, 1858, Ceylon, the androconia is confined to the proximal half of wing, and *turpatalis* also differs in its knotted antenna, smaller size, rather brighter fore wing and more contrasted hind wing.

ADDENDA.

Between the despatch of the first part of this paper to Sarawak and its publication, the Trustees of the British Museum brought out their new volume of the Lep. Phal., comprising new genera and species left in MSS by Sir George Hampson on his retirement in 1920. Amongst these (p. 477) appears the genus *Parolulis*, in which is now placed *Marapana olivescens*, referred to in Sar. Mus. Journ., iii, p. 238, as congeneric with "*Olulis*" *murudensis* (p. 237). This species therefore will now stand as

PAROLULIS MURUDENSIS A. E. Prout.

In the same work (p. 478) is published the genus *Metaphoënia*, the genus referred to on p. 239 of Sar. Mus. Journ. under *Marapana incongrualis carneipennis* (p. 238). This subspecies therefore becomes,

METAPHOËNIA INCONGRUALIS CARNEIPPENNIS A. E. Prout.

In the first division of this paper, specimens of *Carea antennata* Warr. were cited as "Mt. Murud, November, 17." This seems to have been a misreading of November 14. The elevation is correct.

Explanation of Plate 15.

- Fig. 1. *Stenoloba robusta*.
 .. 2. " *elegans*.
 .. 3. *Chloethripa leucocephala*.
 .. 4. *Blenina subterminalis*.
 .. 5. *Paradiopa parthenia*.
 .. 6. *Varicosia venata clavifera*.
 .. 7. *Tamba cosmoloma*.
 .. 8. *Elyra (?) eugenes*.
 .. 9. *Raphiscopa serrata*.
 .. 10. *Simplicia brevicosta*.
 .. 11. " *xanthoma*.
 .. 12. *Subsimplicia punctilinea*.
 .. 13. *Miromelia digramma*.
 .. 14. *Bleptinodes tanaocrossa*.
 .. 15. *Bocana incompleta*.
 .. 16. *Adrapsa insolida*.
 .. 17. " *angulilinea*.
 .. 18. *Bertula rostrilinea*.
 .. 19. *Hydrillodes murudensis*.
 .. 20. " *pertruncta*.
 .. 21. *Echanella obliquistriga*.
 .. 22. *Hypena brevicella*.
 .. 23. *Protophota mjobergi*.

All are types of ♂ names by A. E. Prout except figs. 1, 3, 4, 5, 6, 7, 16 and 18, which are ♀.

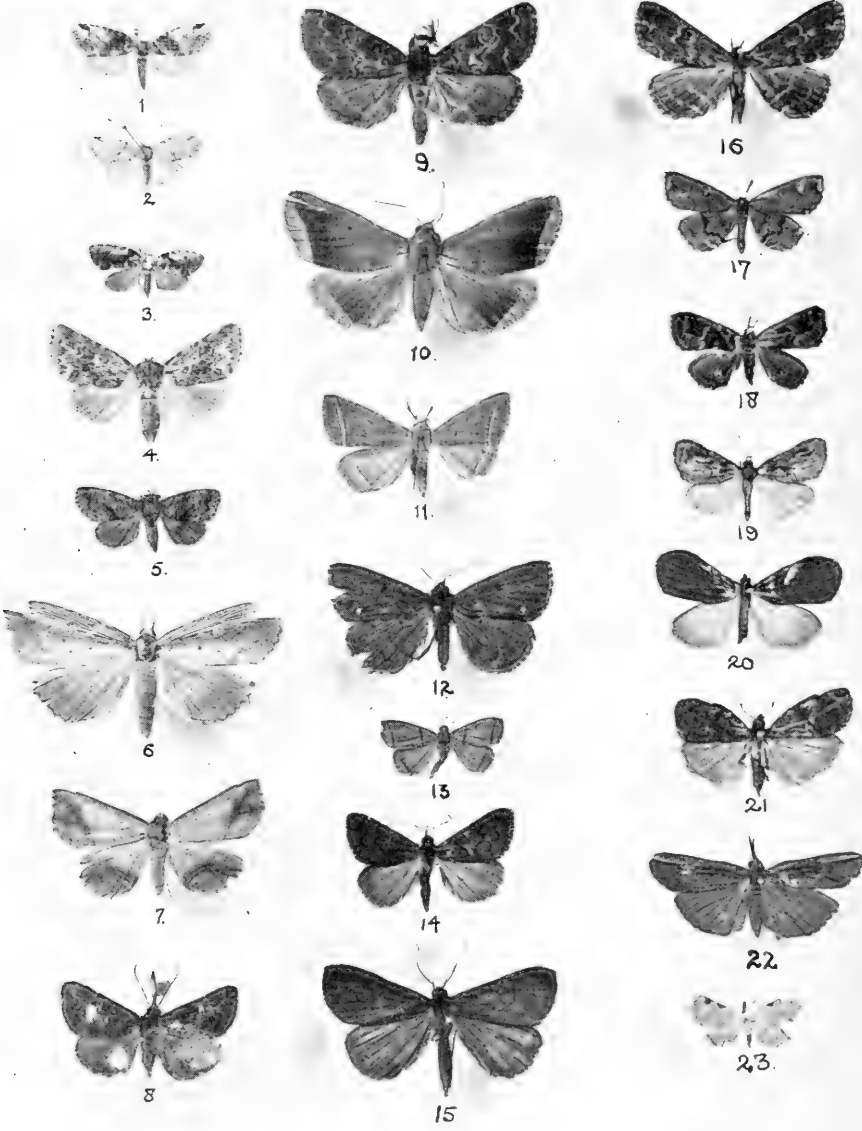
*Explanation of Plate 16.**Sarawak Geometridae (Mjoberg.)*

1. *Brabira emerita* Prout ♂
 11. *Boarmia mesotoechia* Prout ♀
 6. *Ectropis longiscapia* Prout 1♂
 figd. Sar. Mus. Journ. iii (2)
 12. *Prochasma scissivestis* Prout ♂
 7. *Cleora derivata* Prout ♂
 2. *Phthonoloba leptomita* Prout ♀
 13. *Boarmia chloana* Prout ♂
 8. *Cleora praevariegata* Prout ♂
 3. *Bapta juta* Prout ♂
 14. *Dilophodes elegans auribasis*
 Prout ♀
 9. *Cleora aeglophanes* Prout ♂
 4. *Hypochrosis xerophylla* Prout ♂
 15. *Cleora mjobergi* Prout ♂
 5. *Polyscia viridispurca* Prout ♀
 10. *Medasina vinacea* Prout ♂

Geometridae described by L. B. Prout, F.E.S. in the Sarawak Museum
Journal Vol. III., Part 2, Article XII.

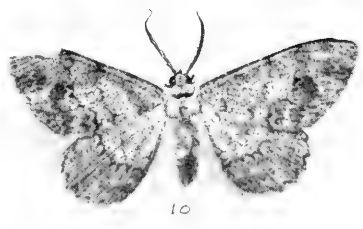
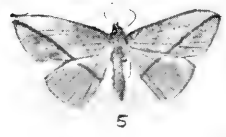
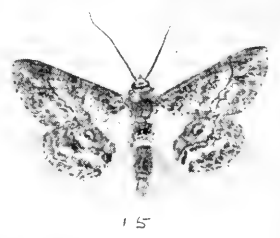
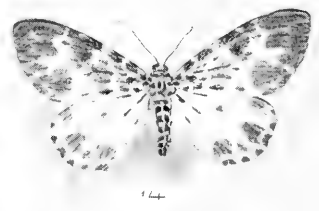
1.	<i>Brabira emerita</i>	Prout ♂	...	...	...	p. 189
2.	<i>Phthonoloba leptomita</i>	Prout ♀	...	...	...	p. 190
3.	<i>Bapta juta</i>	Prout ♂	...	...	...	p. 192
4.	<i>Hypochrosis xerophylla</i>	Prout ♂	...	...	...	p. 195
5.	<i>Polyseia viridispurca</i>	Prout ♂	...	...	...	p. 197
6.	<i>Ectropis longiscapia</i>	Prout ♂	...	...	...	p. 199
7.	<i>Cleora derivata</i>	Prout ♂	...	...	...	p. 203
8.	<i>Cleora praevariegata</i>	Prout ♂	...	...	...	p. 202
9.	<i>Cleora aeglophanes</i>	Prout ♂	...	...	...	p. 203
10.	<i>Medasina vinacea</i>	Prout ♂	...	...	...	p. 208
11.	<i>Boarmia mesotoechia</i>	Prout ♀	...	...	...	p. 205
12.	<i>Prochasma scissivestis</i>	Prout ♂	...	...	...	p. 208
13.	<i>Boarmia chloana</i>	Prout ♂	...	...	...	p. 206
14.	<i>Dilophodes elegans auribasis</i>	Prout ♀	p. 209
15.	<i>Cleora mjobergi</i>	Prout ♂	p. 201





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XXXIII.—Scorpiones and Pedipalpi collected by Dr. E. Mjöberg in Borneo.

By NATHAN BANKS.

A few years ago Dr. Mjöberg sent me a collection of *Scorpiones* from Borneo, largely from Mt. Murud, Mt. Dulit, Mt. Poi, and Mt. Penrissen. Among these is a new species, which by the characters commonly used in the Family must belong to a new Genus. Several of the other species have been but little known, but most of them have been recorded from Borneo by others.

SCORPIONES.

ISOMETRUS MACULATUS De Geer.

Two, not mature, from Brooketon. A common tropical scorpion.

LYCHAS FLAVIMANUS Thorell.

From Mt. Poi, 2000 feet; Lio Matu, and Miri, N. Sarawak. Previously known from Borneo and Sumatra.

HETEROMETRUS LONGIMANUS Herbst.

From Mt. Poi, and Baram River. Known from many localities in India and Malaya.

HORMURUS AUSTRALASIE FABR.

From Brooketon, Lundu, Lio Matu, Tutau River, and the Kalabit Country. Recorded from many places from China to Australia.

CHÆRILUS CELEBENSIS Pocock.

From Mt. Penrissen 4500 feet; and Mt. Murud 4000 to 6300 feet. Previously known from Celebes and the Philippines.

CHÆRILUS VARIEGATUS Simon.

From Mt. Penrissen, 3000 to 4000 feet. Known from Java and Borneo.

CHÆRILUS sp.

From the Bidi caves.

Possibly distinct, but not in good condition.

PARASCORPIOPS gen. nov.

In general structure and appearance much like *Scorpiops*. In the mandibles, maxillary palpi, two spurs at base of the tarsus, lateral lobes of the lip, of the tarsus, sternum, size

and shape of the stigmata, structure of the pectines, etc., it is like *Scorpiops*. It differs in having but two lateral eyes on each side of the cephalothorax (thus by all synoptic tables running into the *Chactinae*). There are ten trichobothria on hind edge of the underside of the tibia of the maxillary palpi; dorsal keels of the cauda without strong end spine; hand on the outer edge about one and two thirds as long as wide. PARASCORPIOPS MONTANA sp. nov.

Cephalothorax very finely granulated over much of the surface, in front deeply emarginate, each lobe coarsely granulate; the eye-tubercle hardly furrowed; the abdominal segments more or less granulate, mostly on the sides; ventral segments smooth. Cauda with very low and scarcely granulate keels, the superior keels the stronger, the end granule not larger, the ventral keels not granulate and indistinct. Pedipalpi with many fine granules, sometimes in irregular lines; femur with five angles, flattened above; each angle is a granulated ridge, another ridge on the inferior surface, and on outer side is an oblique granulated ridge one half way out. Tibia flattened above, four-angled, each one granulated, inner surface with two strong spine-like tubercles near base, under side near hind edge are ten trichobothria; hand fairly broad, flattened above, four-angled, each granulated, outer surface more strongly granulate above, four trichobothria near tip, and five others scattered, one in the middle, three toward base, and one toward tip; under surface with four trichobothria near tip, one near base; inner surface with two trichobothria under base of the finger. Length of body 25 mm., of tail 25 mm., of hand 17 mm. Many specimens from Mt. Poi, Sarawak, 4350 to 5450 feet, also Mt. Dulit, Sarawak, 4000 feet.

PEDIPALPI.

THELYPHONUS DORLÆ Thorell.

From Mt. Penrissen, 3000 feet and Bidi Caves.

Known from Borneo, Java, and Singapore.

THELYPHONUS ANTHRACINUS Pocock.

From Mt. Dulit, 4000 feet. Previously known only from Northwest Borneo.

THELYPHONUS LUCANOIDES Butler.

From Mt. Poi, 4000 to 4500 feet, many specimens.

Described from Borneo; *T. borneesis* Krpln.; is probably a synonym of Butler's species.

XXXIV.—Cicadidæ from Northern Sarawak.

By the late DR. J. C. MOULTON.

The collection of Cicadas brought together by Dr. E. Mjöberg during his expeditions to Mt. Murud and Mt. Dulit and neighbouring country numbers 52 specimens representing 9 genera and 16 species. Among them are two new species one of which represents a most interesting new genus. These were described in my recently published monograph on the Cicadas of Malaysia, but the descriptions are republished here to form a complete record of the valuable collections made by Dr. Mjöberg in northern Sarawak, particularly in the mountainous region of Mt. Murud.

1. DUNDUBIA VAGINATA Fabr.

4 ♂ from Bakong, 1 ♂ from Miri.

Dundubia mannifera auct.; syn. vide Moulton, F.M.S. Museum Journal 1923, p. 83.

Common species throughout the Oriental Region.

2. DUNDUBIA RUFIVENA Wlk.

10 specimens of both sexes from Bakong, Baram, Lio Matu, Pah Trap (Kalabit-country).

Very common throughout Malaysia, extending as far as New Guinea.

3. COSMOPSALTRIA MONTIVAGA Dist.

1 ♂ from Bakong.

Not rare in the mountains of Borneo; recently recorded also from the Malay Peninsula and Sumatra.

4. COSMOPSALTRIA AGATHA Moulton

3 ♂ from Miri.

Only known from Sarawak. The ♀ is yet to be discovered.

5. COSMOPSALTRIA GUTTIGERA Wlk.

7 ♂ from Baram.

Very common in Sarawak, especially at light-houses.

6. PLATYLOMIA SPINOSA Fabr.

6 ♂ from Baram Station.

Common in Borneo and the Malay Peninsula. It has a wide range in the Far East and is apparently rather variable in the shape and size of the opercula.

7. POMPONIA MERULA Dist.

1 ♂ from Miri.

Note rare in Sarawak, where it seems to replace the better known *P. imperatoria* Westwood, which is probably confined to the Malay Peninsula,

8. POMPONIA LINEARIS Wlk.

1 ♂ from Miri.

Pomponia fusca auct.; syn. vide Moulton, F.M.S. Museum Journal 1923, p. 110.

A scarce species in collections; probably has a wide distribution throughout Malaysia.

9. POMPONIA DECEM Wlk.

Pomponia diffusa Breddin et auct.; syn. vide Moulton F.M.S. Museum Journal 1923, p. 109.

1 ♂ from Mt. Murud, 6500 feet, 2 ♂ from Main River (Kalabit-country) 1 ♂ from Long Akar.

Rather a rare mountain species at present only known from Borneo and the Island of Banguay off the north coast of Borneo. I caught one some years ago, struggling in a spider's web in the mountains at an altitude of about 5000 feet, not very far from the above localities given by Dr. Mjöberg. I have also taken it at 3000 feet on Mt. Kinabalu in British North Borneo (1913).

10. POMPONIA FUSCA.

3 ♀ from Mt. Murud, 6000--7000 feet.

The identity of this species is doubtful. It was described by Oliver in 1791 from Sumatra, but without seeing the type it is impossible from the description alone to distinguish it with certainty from closely allied species such as *P. linearis*.

11. POMPONIA RAJAH n. sp.

Moulton, F.M.S. Museum Journal 1923, p. 109.

Male.

Head including eyes much narrower than base of mesonotum. face tumid, rostrum just passing posterior coxae. Head and thorax greenish-olivaceous mottled with castaneous markings, the ocelli black, a vertical castaneous line on pronotum, inner margin and base of post. ocular tumescence on pronotum castaneous, lateral margin toothed anteriorly, broadened at base. Mesonotum with six heavy blotch-like fasciae, two in front of cruciform elevation, two outwardly touching these and extending to anterior margin of mesonotum, two attenuated anteriorly and forming, with a central line, a rough trident; golden pilum on lateral margins on mesonotum. The abdomen dark castaneous with scanty pale golden pilum. Opercula broad, lateral margin and apex evenly and broadly rounded, not extending to 2nd abdominal segment tegmina hyaline, but slightly bronzed, bases of 3rd, 5th and 7th apical areas heavily infuscated; a row of well-defined neural spots along the hind-margin. Wings clear hyaline.

Exp. tegm. 131--139 mm. Total length abd. (excl. tegm.) 46--48 mm.

Type Mt. Murud, 6500 feet. Sarawak November 1922 coll. Dr. E. Mjöberg. Deposited in British Museum.

♂ and ♀ in the Sarawak Museum from the same locality.

Nearest to *Pomponia decem*, but differs in the longer rostrum, smaller expanse of tegmina, more rounded opercula, heavier mottlings on mesonotum, and heavier infuscations on the tegmina. It lacks the intra-neural smoky tinge characteristic of the apical areas in *decem*. The ocelli in that species are not on black ground-colour as in *rajah*. Both species occur together in the same region.

One male of the three examples of *rajah* has a second infuscated nervule closing the 3rd apical area on the left tegmen.

12. CHAMPAKA VIRIDIMACULATA Dist.

1 ♂ from Bakong.

Only known from Borneo, where it is not uncommon.

KALABITA nov. gen.

Moulton, F.M.S. Museum Journal 1923, p. 116.

Head including eyes considerably narrower than base of mesonotum, its length about equal to space between the eyes, its lateral margins tumid but continuous; pronotum considerably shorter than mesonotum, narrowed anteriorly, lateral margins convex anteriorly, sharply concave posteriorly; abdomen slightly longer than space between apex of front and base of cruciform elevation; tympana completely covered, tympanal covering about as broad as long, but narrowed anteriorly; opercula short very globose, wider than abdominal margin and conspicuous from above; rostrum just passing posterior coxae; tegmina and wings hyaline, the former spotted.

Type *K. operculata* described below, from Mt. Murud. Kalabit country, Northern Sarawak, Borneo.

This interesting new genus resembles *Lahugada* Distant, from Assam, in the globose opercula and narrow head, but differs otherwise in many particulars. It is possibly more nearly allied to *Oncotympana* Stal, which however is remarkable for the small opercula and enlarged globose tympanal coverings. In this genus the opercula are enlarged and globose, while the tympanal coverings are small.

13. KALABITA OPERCULATA n. sp. (Plate 14. fig. 1.)

Moulton, F.M.S. Museum Journal 1923, p. 117.

Male.

Front of head testaceous, with castaneous striations on face; vertex testaceous, centrally castaneous and with narrow castaneous fasciae at base of antennae. Pronotum testaceous with central castaneous fascia, a castaneous spot at base of lateral margin. Mesonotum, castaneous except for two incurved olivaceous lines meeting just before the cruciform elevation. Abdomen dark castaneous tympanal coverings and

opercula blackish. Tegmina hyaline, the bases of apical areas except the 6th infuscated; a row of well-defined hind-marginal neural spots. Wings clear hyaline. Clavus of tegmina and wings greenish-grey.

Exp. tegm. 93--99 mm. Total length abdomen (excl. tegm.) 33--34 mm.

Type from Mt. Murud 6,500 feet, Sarawak, 14th November 1922, coll. Dr. E. Mjöberg. Deposited in British Museum.

Three ♂ from the same locality in the Sarawak Museum.

A curious feature about this series of four specimens is the variation in the neuration of the tegmina. The base of the 4th apical area on the right tegmen in three specimens is closed by an additional infuscated nervule; in one of these three the left tegmen is similarly abnormal. The base of the 1st apical area is crossed by one additional infuscated nervule in both tegmina in one specimen, by two in another, by two on the left tegmen and one of the right in a third, and by two on the left tegmen alone in the fourth specimen.

14. RIHANA PONTIANAKA Dist.

1 ♂ from Mt. Murud 6500 feet.

A common species in Malaysia.

15. PLATYPLEURA KAEMPFERI FUSCANGULIS Butl.

1 ♂ from Mt. Murud 6500 feet.

A rare form confined to Borneo. The typical form was described from Japan. Other subspecies occur in Annam (*annamensis* Moulton) Malay Peninsula and Sumatra (*ridleyana* Distant).

16. NELCYNDANA TENER Stal.

1 ♂, 1 ♀, both from Tutau River in the West Kalabit-country.

This is the smallest Cicada known in Borneo; it measures only 20--25 mm. across the tegmina, while the largest Bornean species, *Pomponia merula*, measures about 200 mm., or nearly 8 inches across the tegmina when set.

Prof. C. F. Baker took 2 ♂ and a ♀ of *N. tener* at Sandakan in British North Borneo. These three together with Dr. Mjöberg's pair from Sarawak are the only specimens known from Borneo. Prior to their capture the species was only known from the Philippines.

Two others species of this curious primitive genus are found in Madagascar and another in the Philippines.

In a collection such as this, particularly that part of it which is the result of Dr. E. Mjöberg's work during his prolonged stay on Mt. Murud, the *absence* of certain species is often just as interesting as the presence of other species.

In the Mt. Murud collection for instance, one would have hoped to see *Pomponia graecina*, a mountain species confined to Borneo. Ane of the two rare species of *Nabalua*, at present only known (in Borneo) from Mt. Kinabalu might be expected to occur there, especially as one of them (*N. mascula*) occurs on Mt. Ophir in the Malay Peninsula. The genera *Purana*, *Maua* and *Cryptotympana* are unrepresented, although collecting on other Bornean mountains usually results in the capture of one or more species of these genera. The absence of any species of *Huechys*, brightly coloured little Cicadas, and of *Mogannia* which has four species from Borneo, chiefly from mountain parts, is remarkable and would suggest perhaps that Mt. Murud, although the home of one or two extremely interesting species, has nevertheless rather a scanty Cicadid fauna.

XXXV.—A Collection of Plants from Sarawak. By E. D. MERRILL, Berkeley, California.

In the early part of 1923, Dr. E. Mjöberg, then Director of the Sarawak Museum at Kuching, sent to me at the Bureau of Science in Manila a small collection of plants that he had prepared incidental to his field work in Entomology and Zoology. This was followed by a second similar collection which was forwarded to me at Berkeley, California, in 1924, after my transfer to University of California. These two collections form the basis of the present paper.

The ferns collected by Dr. Mjöberg were for the most part sent to the late Prince Roland Bonaparte in Paris, this being true of all the ferns in the second collection mentioned above; Fifty-five species of ferns and fern allies have been reported upon by him¹. The orchids in the first lot received were sent by me to Mr. Oakes Ames, Boston, Massachusetts, and those of the second collection were sent to him direct by Dr. Mjöberg. This accounts for the fact that but very few ferns and no orchids are enumerated in this paper. In the first collection received the orchids comprised approximately fifty per cent of the entire collection and this is probably true also of the second collection.

The material herein considered was collected at different times on Mounts Dulit, Matang, Murud, Poi, Penrissen, and Gadin, chiefly from higher altitudes, together with some low altitude material from the vicinity of Kuching, and at Lundu, Sadong, Santubong, Bidi Caves, and near the foot of Mount Poi.

¹ Bonaparte, R.—Bornéo [Fougères] récoltes du Dr. E. Mjöberg. *Herbier du Prince Bonaparte—Notes Pteridiologiques* 14 p. 477-488.

Approximately one hundred and seventy-five species are represented in the material handled by me and of these thirty are herein described as new, while a half dozen previously described forms are credited to Borneo for the first time. These figures in themselves are a striking commentary on our present lack of knowledge of the Bornean flora, in that twenty per cent of all the species in a rather casually prepared collection are either new or new to Borneo.

In view of the fragmentary nature of the collections from the various localities it has not been considered advisable to prepare separate lists for the material from each region, as such lists would be of slight significance. I have, therefore, prepared a general enumeration of the entire collection studied by me. For those species previously recorded from Borneo references have been added to my "Bibliographic enumeration of Bornean plants" ¹, where data as to the places of publication and synonyms as well as the known distribution of each are given. For those previously described forms that are not listed in the above publication citations to the original place of publication of each have been added.

The actual types of the species herein described as new are deposited in the Herbarium of the University of California. So far as duplicates were available, a set has been deposited in the Herbarium of the British Museum, Natural History, London.

PTERIDOPHYTA.

HYMENOPHYLLACEAE.

TRICHOMANES Linnaeus.

TRICHOMANES PLUMA Hook. *Ic. 10 (1854) t. 997.*

Mount Dulit and Mount Murud, *Nos. 19, 67*, above an altitude of 1200 m. Malaysia to New Caledonia and Samoa.

¹ Journal Straits Branch Royal Asiatic Society. Extra number (1921) 1.-637.

POLYPODIACEAE.

POLYPODIUM Linnaeus.

POLYPODIUM ALBIDOSQUAMATUM Blume Enum. Pl. Jav. (1828) 132.

Mount Murud, *No. 71*, at or above 1900 m. altitude
Malay Peninsula to the Philippines and New Guinea.

POLYPODIUM TAXODIODES Baker in Journ. Bot. 17 (1879) 42.

Mount Murud, *No. 70*. The species known only from
Borneo, a variety in New Guinea.

POLYPODIUM TRIQUETRUM Blume Enum. Pl. Jav. (1828) 124.

Mount Murud, *No. 68*, at high altitudes. Malay Peninsula
to Java, the Philippines and Samoa.

SCHIZAECEAE.

SCHIZAEA Smith.

SCHIZAEA MALACCANA Baker Syn. Fil. (1868) 428.

Mount Poi, *s.n.*, at or above an altitude of 1400 m. Burma
to Malaysia, not however occurring in the Philippines as
stated by some authors.

LYCOPODIACEAE.

UROSTACHYS Herter.

UROSTACHYS PHLEGMARIA (Linn.) Hert. in Philip. Journ. Sci.,
22, 1923, 66, (*Lycopodium phlegmaria* Linn.)

Mount Murud, *No. 73*, at or above an altitude of 1900 m.
Pantropic.

UROSTACHYS VERTICILLATUS (Linn. f.) Hert. op. cit. 62.

(LYCOPODIUM VERTICILLATUM Linn. f.)

Mount Murud, *No. 73*, with the preceding species.
Pantropic.

SPERMATOPHYTA.**Gymnospermae.**

TAXACEAE.

DACRYDIUM Solander.

DACRYDIUM BECCARII *Parl.*; Merr. Enum. Born. Pl.; (1921) 30.

Mount Dulit and Mount Murud, *Nos. 23, 100*, at and above altitudes of 1200 m. Both specimens are sterile but apparently representing Parlator's species, the type of which was from Mount Poi. Known only from Borneo.

DACRYDIUM ELATUM (Roxb.) Wall.; Merr. Enum. Born. Pl. (1921) 30.

Mount Poi and Mount Penrissen, from altitudes of about 1500 m. *No. 221, s.n.*, the former representing the juvenile form. Indochina to Malay Peninsula, Philippines, and Fiji.

PHYLLOCLADUS L.C. & A. Richard.

PHYLLOCLADUS HYPOHYLLUS Hook. f., Merr. Enum. Born. Pl. (1921) 31.

Mount Poi, *s.n.*, altitude about 1500 m. Philippines.

PODOCARPUS L'Héritier.

PODOCARPUS JAVANICUS (Burm. f.) Merr. in Philip. Journ. Sci. 19 (1921) 334. *P. imbricatus* Blume, *P. curpresinus* R. Br.).

Mounts Murud, Penrissen, and Poi, *No. 99, s.n.* at and above an altitude of 1500 m. Burma and Indochina to Sumatra, Java, and New Guinea.

Angiospermae.

MONOCOTYLEDONAE.

GRAMINEAE.

LEPTASPIS R. Brown.

LEPTASPIS URCEOLATA (Roxb.) R. Br., Merr. Enum. Born. Pl. (1921) 48.

Mount Poi, *No. 142*, near the foot of the mountain. Ceylon to New Guinea.

ISACHNE R. Brown.

ISACHNE JAVANICA Nees; Merr. Enum. Born. Pl. (1921) 44.

Mount Poi, No. 183, at or above an altitude of 1500 m.
Burma to the Malay Peninsula and Java.

CYPERACEAE.

HYPOLYTRUM L. C. Richard.

HYPOLYTRUM SCIRPOIDES (Presl) Merr. Enum. Philip. Pl. 1
(1922) 103. (*H. viridinix* C. B. Clarke).

Mount Poi, s. n., near the foot of the mountain.
Philippines.

CYPERUS Linnaeus.

CYPERUS DIFFUSUS Vahl; Merr. Enum. Born. Pl. (1921) 55.

Lundu, No. 227, at low altitudes. Pantropic.

MARISCUS Gaertner.

MARISCUS CYPERINUS (Retz.) Vahl; Merr. Enum. Born. Pl.
(1921) 56.

Lundu, s. n., at low altitudes. Old World, tropics generally.

MARISCUS DILUTUS (Vahl) Nees; Tropical Asia to the Mascarene Islands and Malaysia; more commonly known as *Mariscus microcephalus* Preal.

CAREX Linnaeus.

CAREX CRUCIATA Vahl.; Merr. Enum. Born. Pl. (1921) 67.

Mount Murud, No. 113, at high altitudes. India to China,
Borneo and the Philippines.

Palmae.

CALAMUS Linnaeus.

CALAMUS RERRUGINEUS Becc.; Merr. Enum. Born. Pl. (1921)
74.

Mount Murud, No. 126, altitude about 1900 m. Known
only from Borneo.

Calamus pilosellus Becc.; Merr. op. cit. 76.

Mount Murud, No. 128, with the preceding and like it known
only from Borneo.

PINAGA Blume.

PINAGA GRACILLIMA sp. nov. § *Orthostichanthe*.

Trunco gracili, circiter 4 mm diametro; foliis 15 ad 23 cm longis, profunde bifidis, subcoriaceis, lobis 12 ad 16 cm longis, 1.3 ad 2 cm latis, glabris, longitudinaliter 5-vel 6-plicatis, apice breviter lobatis, lobis oblongo-ovatis ad lanceolatis, rigidis, acutis vel acuminatis, 5 ad 10 mm longis; petiolo furfuraceo, circiter 2 cm longo, vaginis, 5 ad 8 mm diametro, junioribus furfuraceis, vetustioribus glaberrimis; spathis ignotis; spadicis circiter 13 cm longis, pedunculo vox 3 cm longo, circiter 3 mm diametro, ramis 3, gracilis ciciter 9 cm longis, patulis; fructibus distantibus, 2-rectiserialiter dispostis, oblongo-ellipsoideis vel lanceolato-ellipsoideis, circiter 14 mm longis, 5 mm diametro, utrinque sub-aequaliter angustatis, apice acutis vel brevissime obtuseque rostratis.

Mount Poi, E. Mjöberg s.n., altitude about 1500 m.

A species remarkable for its small bifid leaves and very slender trunks, the maximum diameter of the latter in the specimen before me being 4 mm. Its alliance is with *Pinanga mirabilis* Becc. and *P. tomentella* Becc.

ARACEAE.

HOMALOMENA Schott.

HOMALOMENA PALUDOSA Hook. f., Merr. Enum. Born. Pl. (1921) 95.

Kuching, No. 166, at low altitudes. Malay Peninsula.

ERIOCAULACEAE.

ERIOCAULON Linnaeus.

ERIOCAULON HOOKERIANUM Stapf; Merr. Enum. Born. Pl. (1921) 110.

Mount Poi, No. 128, altitude about 1500 m. Previously known only from Mount Kinabalu, British North Borneo.

ERIOCAULON LONGIFOLIUM Nees; Merr. l.c.

Near Kuching, No. 211. Ceylon to Madagascar, southern China, and Malaysia.

PONTEDERIACEAE.

MONOCHORIA Presl.

MONOCHORIA VAGINALIS (Burm. f.) Presl; Merr. Enum. Born. Pl. (1921) 111.

Kuching, *s.n.* Tropical Asia to Africa, Japan, and Malaysia.

LILIACEAE.

SMILAX Linnaeus.

SMILAX CALOPHYLLA Wall. Cat. No. No. 5131; A.D.C. Monog. Phan. 1 (1878) 60.

Mount Poi, *s.n.*, altitude about 1500 m. Malay Peninsula and Sumatra, new to Borneo.

DIANELLA Lamarck.

DIANELLA ENSIFOLIA (Linn. DC.; Merr. Enum. Born. Pl. (1921) 114.

Mount Murud and Mount Poi, *Nos. 123, 195*, at and above an altitude of 1500 m. Widely distributed in the Old World tropics.

ZINGIBERACEAE.

HEDYCHIUM Koenig.

HEDYCHYIUM MJÖBERGII sp. nov. § *Gandasulium*.

Ut videtur epiphytica; foliis chartaceis, oblongis, acuminatis, circiter 17 cm longis et 5 cm latis, acuminatis, deorsum angustatis, basi cuneatis, glabris vel parcissime pilosis, nervis primariis utrinque circiter 12, tenuibus, adscendentibus, indistinctis; petiolo circiter 1.5 cm longo; vaginis plus minusve adpresse pilosis; ligulis anguste oblongis, obtusis, adpresse pilosis, petiolo subaequantibus; infloescentis terminalibus, cylindraceutis, circiter 15 cm longis, 2 ad 2.5 cm diametro, breviter pedunculatis, bracteis imbricatis, chartaceis vel membranaceis, ellipticis ad oblongo-ellipticis, circiter 3 cm longis, 1.5 cm latis, rotundatis, extus perspicue adpresse ferrugineo-pilosis, intus glabris vel subglabris, plerumque bifloris; bracteolis circiter 1.5 cm longis; calycis tubo circiter

3.5 cm longo, tenue, cylindrico, extus adpresse-piloso; corolae tubus 6 ad 7 cm longus, gracillimus, glaber, lobi angustissime lineares, circiter 2.5 cm longi, 1 mm lati; labellum circiter 2.5 cm longum, stipitatum, stipite circiter 1 cm longo, limbo elliptico, 1.5 cm longo, apice bifido angustis, circiter 3 mm longis; filamentis longe exsertis, antheris circiter 4 mm longis.

Mount Murud, No. 121 E. Mjöberg, October, 1922, from between the altitudes of 1900 and 2400 m. No. 118, from the same locality, a fruiting specimen probably represents the same species.

A species manifestly belonging in the same group as *Hedychium hasseltii* Blume but much smaller, with shorter leaves, very much shorter spikes and entirely different flowers.

CAMPTANDRA Ridley.

CAMPTANDRA ANGUSTIFOLIA Ridl.?; Merr. Enum. Born. Pl. (1921) 120.

Mount Poi, No. 119, near the foot of the mountain. A fruiting specimen, its reference here uncertain. Ridley's species is known only from Sarawak.

HAPLOCHOREMA K. Schumann.

HAPLOCHOREMA sp.?

Lundu, No. 229, April, 1924, an imperfect specimen.

BURBIDGEA Hooker f.

BURBIDGEA NITIDA Hook. f.; Merr. Enum. Born. Pl. (1921) 127.

Mount Murud, No. 122. A monotypic genus known only from Borneo.

GLOBBA Linnaeus.

GLOBBA ATROSANGUINEA Teysm. & Binn., Merr. Enum. Born. Pl. (1921) 122.

Mounts Matang, Penrissen, and Poi, Nos. 144, 224, s.n., at low altitudes, the indentifications by H. N. Ridley. Borneo and Sumatra.

GLOBBA BRACHYANTHERA K. Schum., Merr. op. cit. 223.

Mount Poi, No. 197, det. Ridley, altitude about 650 m. Known only from Borneo.

GLOBBA BURBIDGEI Ridl. in Journ. Bot. 63, 1925) 204.

Lundu, No. 233, April, 1924, det. Ridley. Known only from Borneo.

GLOBBA TRICOLOR Ridl., Merr. l.c.

Mounts Dulit, Matang, and Poi, Nos. 14, 207, s.n., altitude 350 to 1500 m. Known only from Sarawak. Determinations by H. N. Ridley.

BURMANNIACEAE.

BURMANNIA Linnaeus.

Burmattia longifolia Becc., Merr. Enum. Born. Pl. (1921) 133.

Mount Dulit, No. 22, between an altitude of 1200 and 1500 m. On the higher mountains of the Malay Peninsula, Borneo, the Philippines, Amboina, and New Guinea.

DICOTYLEDONAE.

PIPERACEAE.

PIPER Linnaeus.

PIPER sp.

Mount Poi, s.n., at or above an altitude of 1500 m. a single specimen.

MORACEAE.

CONOCEPHALUS Blume.

CONOCEPHALUS AMETHYSTINUS Winkl., Merr. Enum. Born. Pl. (1921) 228.

-Near Kuching, No. 209. Known only from Borneo.

URTICACEAE.

PILEA Lindley.

PILEA sp.

Bidi Caves, s.n., stem and leaves only.

POLYGONACEAE.

POLYGONUM Tournefort.

POLYGONUM PEDUNCULARE Wall., Merr. Enum. Born. Pl. (1921) 245.

Mount Murud, *No. 130*, altitude about 900 m. Tropical Asia to Africa.

MAGNOLIACEAE.

ILLICIAM Linnaeus.

ILLICIAM CAULIFLORUM sp. nov.

Arbor parva, glabra; foliis subcoriaceis, in siccitate olivaceis, utrinque concoloribus, verruculosis, oblong-lanceolatis, subfalcatis, acuminatis, basi cuneatis, 8 ad 10 cm longis, costa supra impressa, nervis lateralibus utrinque circiter 8, supra obscuris, subtus obsolete; petiolo 1 ad 1.5 cm longo; floribus solitariis, lateralis, e ramis vetustioribus, circiter 1.5 cm diametro bibracteolatis, bracteolis ovatis, acutis, 2.5 ad mm longis, margine ciliatis, pedicellis 1 ad 2 cm longis; perianthi segmentis circiter 11, exterioribus (2 vel 3) late ovatis, acutis vel leviter acuminatis, circiter 3 mm longis, plus minusve ciliatis, interioribus majoribus, elliptico-ovatis ad oblongo-ovatis, circiter 8 mm longis, 5 ad 6.5 mm latis, rotundatis; staminibus 20, 1-seriatis, 2.2 mm longis, filamentis brevibus, antheris crassis, obtusis, filamentis subaequantibus; carpellis 11, glabris, circiter 4 mm longis.

Mount Murud, *No. 114*, E. Mjöberg, from between the altitudes of 1900 and 2400 m.

A very strongly marked species characterized by its obscurely nerved leaves and its solitary, pedicelled flowers which are borne on the branches below the leaves, as well as by its broad perianth-segments and its short, stout, 1-seriate anthers.

DRIMYS Forster.

DRIMYS PIPERITA Hook. f., Merr. Enum. Born. Pl. (1921) 252.

Mounts Murud and Poi, *Nos. 101, 102, 193*. High mountains of Borneo, the Philippines, and New Guinea.

ANONACEAE.

POLYALTHIA Blume.

POLYALTHIA BECCARII King; Merr. Enmu. Born. Pl. (1921) 256.

Mount Gadin, Lundu, *s.n.* Malay Peninsula and Borneo.

NEPENTHACEAE.

NEPENTHES Linnaeus.

NEPENTHES LOWII Hook. f., Merr. Enum. Born. Pl. 1921) 283.

Mount Murud, No. 115, the lower portion of a leaf and a detached inflorescence only, no pitcher. Known only from Borneo.

NEPENTHES TENTACULATA Hook. f. var. *imberbis* Becc., Merr. op. cit. 285.

Mount Poi, No. 155. Known only from Borneo.

NEPENTHES sp.

Mount Murud, No. 125, a detached inflorescence only.

SAXIFRAGACEAE.

POLYOSMA Blume.

POLYOSMA MJÖBERGII sp. nov.

Frutex vel arbor parva; ramis teretibus, glabris, ramulis pubescentibus, internodis 5 ad 7 mm longis; foliis numerosis, confertis, oppositis, oblongis ad oblongo-ellipticis, margine revolutis, integris, 3 ad 5 cm longis, 1 ad 1.5 cm latis, basi acutis, apice rotundatis ad obtusis vel abrupte brevissime acuminatis junioribus supra leviter pubescentibus, vetustioribus glabris, nitidis, olivaceis, subtus pallidioribus, puberulis, nervis primariis utrinque circiter 8, distinctis; petiolo 5 ad 8 mm longo, pubescente; inflorescentiis brevibus, confertis, paucifloris, circiter 3 cm longis, dense pubescentibus, pedicellis circiter 3 mm longis; bracteis oblongo-lanceolatis, 3 ad 4 mm longis; calyce 4 mm longo, lobis 1 mm longis, perspicue acuminatis; petalis lanceolatis, obtusis, pubescentibus, intus (basi excepto) villosis; filamentis hirsutis.

Mount Murud, No. 107, E. Mjöberg, October, 1922, between altitudes of 1900 and 2400 m.

A species perhaps as closely allied to *Polyosma hookeri* Stapf as any other species but with flowers only about one-half as long as in the latter species.

LEGUMINOSAE.

MASTERSIA Bentham.

MASTERSIA BORNEENSIS Harm ; Merr. Enum. Born. Pl. (1921) 310.

Kalabit country, Mount Murud trip, No. 131, altitude about 1000 m. Known only from Borneo.

MUCUNA Adanson.

MUCUNA GIGANTEA (Willd.) DC., Merr. Enum. Born. Pl. (1921) 309.

Mount Poi, No. 154, near the foot of the mountain. Usually near the sea, tropical Asia through Malaysia to Polynesia.

POLYGALACEAE.

POLYGALA Tournefort.

POLYGALA VENENOSA Juss., Merr. Enum. Born. Pl. (1921) 95.

Mount Murud, No. 95, near the foot of the mountain. Malay Peninsula and Archipelago extending to the Philippines.

POLYGALA sp.

Mount Murud, No. 91, at or above an altitude of 1500 m. An imperfect specimen representing either an undescribed species or one new to Boreo.

SALOMONIA Loureiro.

SALOMONIA CANTONIENSIS Lour., Merr. Enum. Born. Pl. (1921) 324.

Lundu, No. 236. Southeastern China to the Philippines and Malaysia.

EUPHORBIACEAE.

ANTIDESMA Burman.

Antidesma tomentosum Blume, Merr. Enum. Born. Pl. (1921)

ANTIDESMA TOMENTOSUM Blume, Merr. Enum. Born. Pl. (1921) 333.

Mount Poi, *s.n.*, altitude about 1500 m. Malay Peninsula to Java and Celebes.

TRIGONOSTEMON Blume.

TRIGONOSTEMON DIFFUSUS sp. nov. § *Eutrigonostemon*.

Frutex vel arbor parva, subglabra, ramis teretibus, glabris, pallidis, circiter 2 mm diametro, ramulis tenuibus, novellis plus minusve hirsutis; foliis inaequalibus, membranaceis, olivaceis, glabris vel subtus ad costa nervisque parcissime hirsutis, lanceolatis ad oblongo-lanceolatis, 12 ad 19 cm longis, 3.5. and 6 cm latis, tenuiter caudato-acuminatis, basi acutis et plerumque supra biglandulosis, distanter crenato-denticulatis, nervis primariis utrinque circiter 10, subtus distinctis, arcuato-anastomosantibus; petiolo 1 ad 2.5 cm longo; inflorescentiis terminalibus lateralibusque, tenuis, diffusis, plerumque longe tenuiter pedunculatis, multiramosis, 15 ad 35 cm longis, glabris; floribus ♂ caducis, circiter 7.5 mm diametro, sepalis ovatis, obtusis vel rotundatis, 2 mm longis; petalis oblongo-ovatis, ut videtur atro-purpureis, glabris, circiter 4 mm longis, 2.8 mm latis, deorsum angustatis; antheris 3, oblongis, 0.8 mm longis. Floribus ♀ fructibusque ignotis.

Mount Poi, No. 145, E. Mjöberg, near the foot of the mountain.

A species remarkable for its very slender, elongated, diffuse, staminate inflorescences which attain a length of 30 cm, in some cases the branches being comparatively few, in others being very numerous. The flowers fall very readily so that in spite of the greatly developed inflorescences the flowers at any one time are apparently very few in number.

MALLOTUS Loureiro.

MALLOTUS BRACHYTHYRSUS sp. nov. § *Axenfeldia*.

Frutex vel arbor parva, inflorescentiis exceptis glabra, ramis teretibus; foliis alternis, chartaceis, lanceolatis ad oblongo-lanceolatis, 7 ad 11 cm longis, 2.5 ad 3.5 cm latis, in siccitate castaneo-olivaceis, nitidis, concoloribus, tenuiter acuminatis, basi subacutis, bimaculatis, margine deorsum integris, sursum leviter repando-crenatis, subtus parcellissime granuloso-glandulosis, nervis utrinque circiter 8, distinctis; petiolo 3 mm longo; stipulis lanceolatis, acuminatis, glabris, circiter 1 cm longis; inflorescentiis ♂ oppositifoliis, racemosis vel depauperato-paniculatis, circiter 1 cm longis, paucifloris, plus minusve cinereo-pubescentibus et granuloso-glandulosis, bracteolis ovatis, ad oblongo-ovatis, leviter pubescentibus, acuminatis, circiter 2 mm longis; floribus breviter pedicellatis, sepalis 3, oblongo-glandulosis; staminibus circiter 30, filamentis 1 ad 2 mm longis, antheris orbiculari-ellipticis, connectivo haud producto.

Mount Poi, No. 147. E. Mjöberg, near the foot of the mountain.

A species well characterized by its very short few flowered staminate inflorescences. Pistillate flowers and fruits unknown.

CELASTRACEAE.

LOPHOPETALUM Wight & Arnott.

LOPHOPETALUM BECCARIAUM Pierre, Merr. Enum. Born. Pl. (1921) 354.

Mount Poi, No. 143, near the foot of the mountain. The specimen almost certainly represents this very imperfectly described species which is known only from Sarawak.

AQUIFOLIACEAE.

ILEX Linnaeus.

ILEX CONFERTIFOLIA sp. nov. § *Thyrsoprinus*, (Hb?)4).

Frutex glaberrimus (vel arbor parva), ramis rigidis, ramulis circiter 2 mm diametro; foliis numerosis, crasse coriaceis, oblongis, obtusis, circiter 1 cm longis, 3 ad 5 mm latis, in

siccitate valde longitudinaliter revolutis, obtusis, costa supra impressa, nervis obsoletis; racemis paucis, in axillis superioribus, 4 ad 6-floris, haud 3 mm longis, rhachi crassa, glabra; pedicellis circiter 2 mm longis; calycis circiter 2.5 mm diametro, lobis late ovatis, parce ciliatis; corolla geabra, circiter 2 mm longa, lobis 4 vel 5, oblongo-ovatis, obtusis, 1.4 mm longis; ovario 4 vel 5-loculari.

Mount Murud (No. 93, E. Mjöberg, October, 1922, near the summit of the mountain, apparently in exposed places, altitude about 2400 m.

A species allied to *Ilex havilandii* Stapf of mount Kinabalu but with smaller, differently shaped, nerveless leaves, shorter and fewer flowered racemes, shorter pedicels, and slightly ciliate calyces.

ELAEOCARPACEAE.

ELAEOCARPUS Linnaeus.

ELAEOCARPUS MURUDENSIS sp. nov. § *Dicera*.

Arbor, partibus junioribus dense pubescentibus, ramis glabris, ramulis subferrugineo-pubescentibus; foliis numerosis, oblongo-ellipticis, olivaceis, opacis, 6 ad 10 cm longis, 2 ad 4.5 cm latis, obtusis, basi acutis ad obtusis, margine leviter crenatis, crenulis saepe apiculatis, utrinque in sicco perspicue pistulatis, supra (junioribus exceptis) glaberrimus, subtus ad costa nervisque pilosis; nervis lateralibus utrinque 6 vel 7, perspicuis, arcuato-anastomosantibus, laxe reticulatis; petiolo 8 ad 15 mm longo; racemis axillaribus vel e axillis defoliatis, solitariis, paucis, circiter 10 m longis, pilosis; floribus 5-meris, circiter 9 mm longis, pedicellis pilosis, sursum incrassatis, floribus subaequantibus, sepalis oblongis, intus glabris vel subglabris; petalis circiter 8 mm longis, sursum leviter ampliatis, oblongis, in partibus superioribus (ca. 3 vel 4 mm) laciniatis, laciniis circiter 15, tenuibus, 2 ad 2.5 mm longis, in partibus inferioribus (ca. 3 mm) ad margine et intus pilosis, extus glabris; staminibus circiter 15, filamentis 1.5 ad 2 mm longis, antheris scaberulis, anguste oblongis, 2.5 ad 3 mm longis, obtusis; ovario triloculari, dense piloso, stylis 3.5 mm longis, deorsum pilosis; disco circiter 3 mm diametro, dense piloso.

Mount Murud, No. 83, E. Mjöberg, October, 1922, from between the altitudes of 1900 and 2400 m.

A species well characterized by its conspicuously pistulate leaves and not closely allied to other representatives of the genus presenting this character that are known to me. Its true alliance seems to be with *Elaeocarpus urayi* King of the Malay Peninsula.

MALVACEAE.

ABELMOSCHUS Medicus.

ABELMOSCHUS MOSCHATUS Medic., Merr. Enum. Born. Pl. (1921) 373.

Lundu, No. 230, at low altitudes. Pantropic, although a native of the Old World tropics.

STERCULIACEAE.

COMMERSONIA Forster.

COMMERSONIA BARTRAMIA (Linn.) Merr., Merr. Enum. Born. Pl. (1921) 378.

Lundu and near the foot of Mount Poi, Nos. 200, 237, Tropical Asia through Malaysia to Australia and Polynesia, more commonly known as *C. platyphylla* Anders. and *C. echinata* Forst.

DILLENIACEAE.

SAURAUIA Willdenow.

SAURAUIA PLANCHONII Hook. f., Merr. Enum. Born. Pl. (1921) 386.

Mount Penrissen, No. 219, s.n., one indicated as from an altitude of about 1000 m. the other from the foot of the mountain. Known only from Borneo.

OCHNACEAE.

NECKIA Korthals.

NECKIA SERKATA Korth., Merr. Enum. Born. Pl. (1921) 388.

Santubong, No. 161, at low altitudes, Sumatra and Borneo, although Ridley expresses the opinion that the Bornean form is distinct from Korthals' species and should be retained as *Neckia lancifolia* Hook. f.

THEACEAE.

SCHIMA Reinwardt.

SCHIMA NORONHAE Reinw., Merr. Enum. Born. Pl. (1921) 390.

Mount Poi, No. 194, altitude about 1500 m. Burma to Sumatra and Java.

VIOLACEAE.

RINOREA Aublet.

RINOREA ANGUIFERA (lour.) O. Kuntze; Merr. Enum. Born. Pl. (1921) 410.

Kuching, No. 170, at low altitudes. Indochina to the Malay Peninsula and Sumatra, more commonly known as *Alsodeia echinocarpa* Korth.

BEGONIACEAE.

BEGONIA Linnaeus.

BEGONIA BARAMENSIS sp. nov.

Planta erecta, glabra, ut videtur elata; foliis late peltatis perspicue inaequilateralibus, integris vel prope apicem obscurissime distanter denticulatis. inaequilateraliter oblongo-ovatis, tenuiter acuminatis, basi radiatim 8-nerviis, late rotundatis, haud cordatis, 16 ad 17 cm longis, 7 ad 11 cm latis, olivaceis, laevis, nitidis, membranaceis, subtus pallidioribus; petiolo 4 ad 7 cm longo; inflorescentiis circiter 8 cm longis, dichotomis, breviter (1.5 ad 2.5 cm) pedunculatis, paucifloris; floribus ♂ circiter 1.2 cm diametro, sepalis 2., reniformi-ovatis, circiter 6 mm longis, 7 diametro, sepalis 2, reniformi-ovatis, circiter 6 mm longis, 7 mm latis, rotundatis, basi truncato-subcordatis, 13 ad 15-nerviis; staminibus circiter 75, filamentis 1 mm longis, anthesis oblongo-obovoides, 0.7 mm longis; capsulis inaequaliter 3-alatis, cum alis 3 ad 5 cm longis et 3 ad 4 cm latis, basi rotundatis, apice truncatis vel oblique truncatis.

Sarawak, Upper Baram River, J. C. Moulton, 1920.

A species remarkable for its large, entire, acuminate, inaequilateral, oblongo-ovate, not at all cordate, widely peltate, leaves, the petiole being inserted 2 to 3 cm from the margin of the narrow side of the leaf, the broadly rounded basal part of the leaf being extended below the insertion of the petiole from 4 to 7 cm. The unusually large capsules are also characteristic, the elliptic capsule proper not exceeding 1.5 cm in length, but the membranaceous wings being extended both below and above the capsule, the larger one having a total length of from 3 to 5 cm and a width, in the upper part, of from 2 to 2.5 cm broadly rounded below, the upper margin straight, usually oblique; the two smaller wings are but about 2 cm long and 1 cm wide, acute at the base and rounded on the upper outer angles.

BEGONIA BORNEENSIS A.DC., Merr. Enum. Born. Pl. (1921): 414.

Mount Poi, No. 186, an imperfect specimen probably referable here. The species is known only from Borneo.

BEGONIA MURUDENSIS sp. nov.

Planta erecta, glabra, ut videtur elata; foliis chartaceis, in siccitate brunneo-purpureis, nitidis, laevis, valde inaequalateralibus, lateraliter cordatis, distanter obscure dentatis, tenuiter acuminatis, 9 ad 14 cm longis, 4 ad 5.5 cm latis, basi radiatim 7 ad 9 nerviis nervis subtus valde perspicuis rectis; petiolo 2. ad 3.5 cm longo; stipulis oblongo-lanceolatis, acuminatis, circiter 2 cm longis; infructescentiis solitariis, in axillis superioribus, pedunculatis (pedunculo 2.5 cm longo) capsulis binis longissime (5 cm) pedunculatis ferentibus; floribus ♂ magnis, ut videtur paucis circiter 4 cm diametro, sepalis 2, orbiculari-ovatis, rotundatis, 2. cm diametro, basi late truncato-subcordatis; staminibus circiter 80, filamentis 1.5 ad 2.5 mm longis, antheris oblongis, apice rotundatis, deorsum leviter angustatis, 2 mm longis; capsulis cum alis circiter 3 cm longis et 4 cm latis, inaequaliter 3-alatis, obtriangularis, basi acutis, apice truncatis, angulis exterioribus rotundatis, alis binis majoribus circiter 1.5 cm latis, minoribus 1 cm latis.

Mount Murud, No. 119, E. Mjöberg, October, 1922, from altitudes between 1900 and 2400 m.

A species strongly marked by its unusually large staminate flowers, the sepals being about 2 cm in diameter, and its large obtriangular capsules which are gradually narrowed from the rounded outer corners of the wings to the cuneate base, two of the wings being larger than the other one but with the same general shape. The capsule proper is suborbicular in outline, apparently dehiscing close to the wings, the wings being extended both below and above it. The apex of the entire fruit is somewhat reentrant-truncate, not straight across the top. The torus bearing the stamens is about 5 mm long.

BEGONIA POLYGONOIDES Ridl., Merr. Enum. Born. Pl. (1921) 415.

Mount Matang, No. 203, altitude about 300 m. This species is known only from the locality indicated.

BEGONIA PROPINQUA Ridl.?, Merr. Enum. Born. Pl. (1921) 416.

Mount Poi, *s.n.* A single imperfect specimen perhaps referable to Ridley's species which is said to be common in Sarawak.

BEGONIA CONSANGUINEA sp. nov.

Species *B. isopterae* affinis, differt capsulis majoribus, apice truncatis, deorsum angustatis, alis latioribus, foliis minus inaequilateribus. Planta erecta, ut videtur elata, glabra vel partibus junioribus leviter pubescentibus; foliis inaequilateralibus, oblongis ad oblongo-obovatis, membranaceis, glabris, nitidis, 12 ad 18 cm longis, 4.5 ad 8 cm latis, tenuiter subcaudato-acuminatis, basi inaequilateralibus acutis ad rotundatis vel leviter oblique cordatis, margine deorsum integris, sursum irregulariter dentatis vel denticulatis; petiolo 5 ad 15 mm longo; stipulis; lanceolatis, tenuiter acuminatis, falcatis, 1.5 ad 2 cm longis; inflorescentiis circiter 15 cm longis; pedunculatis, basi capsulis binis ferentibus, laxis, floribus numerosis, bracteolis minutis, deciduis; floribus ♂ circiter 1 cm diametro, pedicellis ad 5 mm longis, sepalis ellipticis ad orbiculari-ellipticis, tenuiter 5 vel 7-nerviis, rotundatis, 5 mm longis; staminibus 35 ad 40, filamentis 0.5 mm longis, antheris oblongo-ellipsoideis ad anguste obovoideis, 1 mm longis; capsulis cum alis 2.5 cm longis et latis, subaequaliter 3-alatis, apice truncatis, deorsum leviter angustatis, rotundatis, pedicellis circiter 1.5 cm longis.

Sarawak, Sadong, Native collector 2560 *Bur. Sci.*, Lundu, E. Mjöberg, 329; without locality, Foxworthy, 348; Mount Penrissen, Mjöberg 222 (type); Mount Poi, Mjöberg 151, the latter with shorter inflorescences and slightly larger flowers than the type.

This species is very similar to *Begonia isoptera* Dryander of the Malay Peninsula, Sumatra, and Java, but its leaves are larger and less inequilateral, while its capsules are distinctly larger and very different in shape, being exactly truncate at the top, not rounded, the outer angles slightly rounded.

BEGONIA SPELUNCAE Ridl., Merr. Enum. Born. Pl. (1921) 416.

Bidi Caves, No. 177, the type locality. A species known only from this place.

BEGONIA sp.

Salak, No. 178, a very fragmentary specimen.

BEGONIA sp.

Mount Poi, *s.n.* A species entirely different from any of those at present known from Borneo and probably representing an undescribed species. More complete material is essential. It is apparently a scandent species, the younger parts and long petioles being supplied with scattered, slender, spreading, elongated hairs.

MYRTACEAE.

RHODAMNIA Jack.

RHODAMNIA CINEREA Jack, Merr. Enum. Born. Pl. (1921) 423.

Mount Poi, No. 159. Apparently common in Borneo, extending from Burma through Malaysia to tropical Australia.

XANTHOMYRTUS Diels.

XANTHOMYRTUS TAXIFOLIA (Ridl.) comb. nov.

MYRTUS TAXIFOLIA Ridl. in Kew Bull. (1914) 209, Merr. Enum. Born. Pl. (1921) 424.

Mount Poi, No. 179, altitude about 1700 m. Known only from this mountain; Gunong Rumput, the type locality, is one of the peaks of Mount Poi.

XANTHOMYRTUS MOULTONII (Merr.) comb. nov.

MYRTUS MOULTONII Merr. in Journ. Straits Branch Roy. As. Soc. 86 (1922) 337.

Sarawak, Upper Baram, Gunong Temabok, Moulton 6747, altitude about 2100 m. Endemic.

XANTHOMYRTUS FLAVIDA (Stapf.) Diels in Engl. Bot. Jahrb. 57 (1922) 366.

MYRTUS FLAVIDA Stapf. in Hook. Ic. IV 3 (1894) t. 229).

British North Borneo, Mount Kinabalu, Haviland 1155, Gibbs 4284, Clemens 10525. The species endemic, the variety *glabrescens* (Gibbs) Diels (*Myrtus flavida* Stapf. var. *glabrescens* Gibbs) in New Guinea.

The synonymy of *Xanthomyrtus flavida* is given primarily to make Diels' transfer valid. He enumerates the species simply as "*Xanthomyrtus flavida* Stapf. var. *glabrescens* Gibbs in N.W. New Guinea 1917, 150." Neither the species nor the variety were so published, both being placed under *Myrtus*.

Diels has with good reasons proposed the genus *Xanthomyrtus* as distinct from *Myrtus*, for a number of Papuan species, including also *Myrtus flavida* Stapf. of Borneo, one species in New Caledonia, and apparently one in north-eastern Australia; to these must be added two Philippine species *Eugenia diplycosifolia* C.B. Rob., and *Eugenia aurea* Elmer.

EUGENIA Micheli.

EUGENIA. spp.

Three species are represented by incomplete specimens, all from Mount Poi, No. 152, the others single specimens, without numbers. I have not been able to refer any of these to described forms.

LEPTOSPERMUM Forster.

LEPTOSPERMUM JAVANICUM Blume, Merr. Enum. Born. Pl. (1921) 436.

Mounts Poi and Murud, No. 92, s.n., from altitudes above 1500 m. Indochina to Sumatra, Java, and Celebes.

BAECKEA Linnaeus.

BAECKEA TAXIFOLIA sp. nov. § *Harmogia*.

Frutex glaberrimus, ramis teretibus, ramulis rigidis, circiter 1.5 mm diametro, cicatricibus multis instructis; foliis numerosis, rigidis, curvatis, confertis, eglandulosis, 6 ad 8 mm longis, circiter 1 mm latis, obtusis, deorsum leviter angustatis; floribus axillaribus, solitariis, sessilibus, circiter 5 mm longis, 5 ad 6 mm diametro, calycis tubo infundibuliformi, 3 mm diametro, lobis triangulari-acutis, 1.2 mm longis, glandulis paucis instructis; petalis 2 ad 2.2 mm longis, ellipticis ad elliptico-oblongis, rotundatis, glandulis paucis magnis instructis; staminibus 15, filamentis vix 1 mm longis; ovario triloculare.

ARGOSTEMMA LANCEOLATUM Valetton, Merr. Enum. Born. Pl. (1921) 549.

Near Kuching, No. 216, June 30. Known only from Borneo.

ARGOSTEMMA MJÖBERGII sp. nov.

Planta glabra (inflorescentiis exceptis) simplex, caulis circiter 2.5 mm diametro, deorsum prostratis, radicanibus, sursum erectis, 30 ad 45 cm longis; foliis 8 vel 10, in paribus aequalibus, in siccitate nigris, plerumque albedo-puncticulatis, oblongo-ovatis, chartaceis, acute acuminatis, basi plerumque rotundatis, 6 ad 9 cm longis, 2 ad 3.5 cm latis, nervis utrinque circiter 9, supra obsoletis vel subobsoletis, subtus tenuibus, distinctis; petiolo 1 ad 2 cm longo; stipulis circiter 1 cm longis, lanceolatis; inflorescentiis terminalibus, umbellatis, longe (circiter 9 cm) pedunculatis, circiter 10-floris, pedunculo glabro, pedicellis circiter 1.5 cm longis, leviter pubescentibus, bracteolis lanceolatis, acuminatis, glabris, circiter 5 mm longis; floribus circiter 1.5 cm diametro, ut videtur albidis, calyce leviter pubescenti, lobis 5, oblongo-ovatis, acutis vel acuminatis, circiter 1.5 mm longis; petalis lanceolatis, circiter 7 mm longis.

Mount Poi, E. Mjöberg, *s.n.*, altitude between 1200 and 1700 m.

A species belonging in the group with *Argostemma montanum* Blume but entirely glabrous except for the slightly pubescent pedicels and calyces.

ARGOSTEMMA MURUDENSE sp. nov.

Herba simplex vel parce ramosa, caulis foliisque utrinque perspicue crispato-ciliatis; caulis 10 ad 15 cm longis, deorsum prostratis, radicanibus, sursum erectis; foliis 6 ad 10, in paribus subaequalibus, ovatis ad late elliptico-ovatis, chartaceis, olivaceo-branneis, acutis vel obtusis, basi rotundatis 1.5 ad 3 cm longis, 1 ad 1.5 latis, nervis utrinque 6 vel 7, patulis, tenuibus, supra obsolete; petiolo 4 ad 8 mm longo; stipulis circiter 3 mm longis, subellipticis, obtusis, intus glabris, extus dense villosis; inflorescentiis terminalibus, tenuiter pedunculatis, pedunculo glabro, circiter 2 cm longo; floribus umbellatis, umbellulis circiter 5-floris, pedicellis pubescentibus, 4 mm longis, bracteolis minutis; calyce pubescenti, lobis ovatis, acutis, circiter 1 mm longis; petalis elliptico-ovatis, acutis, circiter 6.5 mm longis.

Mount Murud, Nos. 82 (type), 88, E. Mjöberg, between the altitudes of 1900 and 2400 m., October, 1922.

A species characterized by its crisped indumentum which is conspicuous on both surfaces of the small, subequal leaves, and on the stems, and petioles.

ARGOSTEMMA SALICIFOLIUM Ridl., Merr. Enum. Born. Pl. (1921) 550.

Mount Matang, Nos. 205, 206, July, altitude about 300 m. Known only from this region, the type locality.

ARGOSTEMMA spp.

Mount Poi, two species without number, one somewhat approximating *A. kinabaluense* Wernh. The material is insufficient.

TARENNA Gaertner.

TARENNA FRAGRANS (Blume) Koord. and Val., Merr. Enum. Born. Pl. (1921) 561.

Near Kuching, No. 214. Malay Peninsula and Archipelago extending to Palawan in the Philippines.

GARDENIA Ellis.

GARDENIA sp.

Near Kuching, s.n., a single specimen.

PAVETTA Linnaeus.

PAVETTA INDICA Linn., Merr. Enum. Born. Pl. (1921) 570.

Mount Poi, No. 150, near the foot of the mountain. India to southern China through Malavsia to tropical Australia.

IXORA Linnaeus.

IXORA MJÖBERGII sp. nov.

Frutex (vel arbor parva?) glaber, ramulis teretibus, 2 mm diametro; foliis chartaceis, oblongis, sessilibus, basi late cordatis, apice obtusis ad obtuse acuminatis, 15 ad 20 cm longis, 5 ad 7 cm latis, olivaceis, nervis lateralibus utrinque circiter 14, perspicuis; stipulis 4 ad 5 mm longis, basi late ovatis, abrupte caudato-apiculatis; inflorescentiis terminalibus, erectis, pedunculatis (pedunculo 4 cm longo), circiter 10 cm longis, 10 ad 12 cm latis, trichotomis, ramis primariis paucis, circiter 4 cm longis, bracteis lanceolatis, acuminatis, circiter 5 mm longis, bracteolis minutis, vix 0.5 mm longis; floribus 3.5 ad 4 cm longis, ut videtur rubris, plerumque in ramulis ultimis in triadibus dispositis, interioribus sessilibus, lateralibus breviter (0.5 ad 2.5 mm) pedicellatis; calyce subturbinato, circiter 1.5 mm longo, margine minute lobulato, lobulis vix 0.3 mm longis; corollae tubo circiter 3.5 cm longo, lobis 4, patulis, ellipticis, rotundatis, circiter 8 mm longis.

Louren, Mount Gadin, No. 226, E. Möberg, May 24, altitude not indicated but apparently from low elevations.

A species belonging in the general group with *Ixora fulgens* Roxb. and *I. lobhii* Loud., but with thinner leaves which are sessile and broadly rounded-cordate at the base.

IXORA SESSILILIMBA sp. nov.

Frutex (vel arbor parva?) glaber, ramis teretibus, ramulis plus minusve compressis, circiter 3 mm diametro; foliis coriaceis vel subcoriaceis, sessilis, late oblanceolatis ad anguste oblongo-obovatis, perspicue acute acuminatis, deorsum angustatis, basi abrupte rotundatis 1 ad 2.5 cm latis, in siccitate olivaceis, subtus pallidioribus, utrinque nitidis, 19 ad 24 cm longis, 6 ad 9 cm latis, nervis primariis utrinque circiter 16, perspicuis, patulis, arcuato-anastomosantibus; stipulis circiter 1 cm longis, basi latissime ovatis, abrupte contractis, longissime (circiter 7 mm) acuminatis; cymis terminalibus,

breviter vel vix pedunculatis, dense multifloris, 8 cm longis, circiter 15 cm latis, ramis primariis paucis, inferioribus patulis, circiter 3 cm longis, bracteis rigidis, oblongo-lanceolatis, acutis vel acuminatis, 2.5 ad 4 mm longis; floribus circiter 4 cm longis, ut videtur rubris, in ramulis ultimis in triadibus dispositis, interioribus sessilibus, lateralibus breviter (1.5 ad 2.5 mm) crasse pedicellatis, bracteolis oblongo-ovatis, circiter 1 mm longis; calyce circiter 3 mm longo, subinfundibuliformi, lobis 4, late ovatis, obtusis, vix 1 mm longis; corollae tubo 4 cm longo, lobis patulis, ellipticis, rotundatis, 1.5 cm longis, circiter 7 mm latis.

Mount Murud, No. 116, E. Mjöberg, October, 1922, indicated altitude 1900 and 2400 m.

Mount Murud, Nos. 84, 111, October, 1922, on naked exposed ledges at the summit, altitude 2400 m.

A species in aspect distinctly different from *Baeckea frutescens* Linn., with rigid branchlets, stouter, curved, obtuse, shorter, eglandular leaves and larger sessile flowers. The petals are attached by broad bases, not narrowed below, and the stamens are in groups of threes opposite each petal, not in pairs, the inner filament of each group being somewhat longer than the two lateral ones. *Baeckea frutescens* Linn., as it occurs in southeastern China and in Borneo, is a low-altitude species, although in the Malay Peninsula it occurs on the higher mountains.

ARALIACEAE.

SCHEFFLERA Forster.

SCHEFFLERA REMOTISERRATA sp. nov. § *Heptapleurum*.

Frutex scandens, glaber, ramulis circiter 4 mm diametro; foliis longe (ca. 12 cm) petiolatis, 5-foliolatis, foliolis lanceolatis, rectis vel falcatis, chartaceis ad subcoriacis, 8 ad 12 cm longis, 1.4 ad 2 cm latis, breviter (ca. 1 cm) petiolulatis, utrinque subaequaliter angustatis, basi cuneatis, apice tenuiter caudato-acuminatis, deorsum integris sursum utrinque dentibus 1 ad 3 distantibus parvis instructis; nervis lateralibus distantibus, paucis, indistinctis; inflorescentiis terminalibus, longe (ca. 9 cm) pedunculatis, furcatis, ramis primariis binis, pedunculo aequantibus, ramulis secundariis umbellatis, paucis, 2 ad 3 cm longis; floribus paucis, 6-meris, umbellatis, umbellulis 3 and

5 floris, pedicellis 5 ad 6 mm longis; calyce turbinato, 2 ad 2.5 mm diametro; petalis 6, oblongo-ovatis, acutis, 2.8 mm longis; stylo 0.

Mount Poi, *s.n.*, at or above an altitude of 1500 m.

A species strongly characterized by its very lax, few elongated, dichotomous inflorescences which attain a length of 25 cm, as well as by its narrowly lanceolate, caudate-acuminate, very sparingly toothed leaflets. Rarely the leaflets are entire showing no signs of teeth, the few teeth when present being confined to the upper one-third of the leaflet.

SCHEFFLERA MJÖBERG sp. nov. § *Heptapleurum*.

Frutex, partibus junioribus et inflorescentiis et subtus foliis pilosis, ramulis 6 ad 9 mm diametro; foliis 1-foliatis, foliolis crasse coriaceis, ellipticis, integris, circiter 18 cm longis et 11 cm latis, vasi late rotundatis, apice rotundatis vel brevissime abrupteque acuminatis, margine valde revolutis, supra glabris, olivaceis, subtus plus minusve pilosis; nervis lateralibus utrinque circiter 12, subtus distinctis; petiolo crasso, circiter 2 cm longo; inflorescentiis terminalibus, brevissime crasseque pedunculatis, pedunculo vix 1 cm longo, ramis primariis 3, rigidis, circiter 10 cm longis, omnibus partibus pilosis, ramulis secundariis racemose dispositis, paucis, oppositis vel 3-verticillatis, 2 ad 2.5 cm longis, floribus in ramulis secundariis umbellatim dispositis, umbellulis 5 ad 9-floris; floribus 6-meris, calycis tubo ovoideo-turbinato, 3 mm longo, truncato, haud angulato, plus minusve stellato-pubescenti; ovario 6-loculari, stylo cylindrico, crasso, circiter 1 mm longo.

Mount Murud, No. 117, E. Mjöberg, October, 1922, at or above an altitude of 1900 m.

Among the few species of this genus with simple leaves the present one is strongly characterized by its indumentum, and its entire, elliptic, thickly coriaceous leaves, their margins strongly revolute. In spite of its simple leaves it is clearly a representative of this genus.

SCHEFFLERA sp.

Mount Poi, *s.n.*, a very fragmentary specimen with only portions of a detached inflorescence.

MELASTOMATACEAE.

ALLOMORPHIA Blume.

ALLOMORPHIA sp.?

Mount Matang, *s.n.*, altitude 300 m. A very characteristic plant with long narrow leaves probably belonging in this genus. There are no complete flowers available.

DRIESSENIA Korthals.

DRIESSENIA CILIATA Becc., Merr. Enum. Born. Pl. (1921) 439.
Lundu, *s.n.* A species known only from Sarayak.

DRIESSENIA AXANTHA Korth., Merr. l.c.

Mount Poi, *No. 201*, near the foot of the mountain. Previously reported only from Dutch Borneo.

PHYLLAGATHIS Blume.

PHYLLAGATHIS HIRSUTA Cogn., Merr. Enum. Born. Pl. (1921) 440.

Mount Poi, *No. 157*, *s.n.*, altitude indicated as above 1400 m. The specimens, which are rather incomplete, agree fairly well with Cogniaux's description and figure, although the flowers appear to be 5-merous rather than 4-merous.

ANERINCLEISTUS Korthals.

ANERINCLEISTUS BECCARII Cogn., Merr. Enum. Born. Pl. (1921) 441.

Mount Poi and Santubong, *Nos. 140, 156, 163*, at low altitudes. A species known only from Borneo.

SONERILA Roxburgh.

SONERILA HETEROPHYLLA Jack in Malay Miscel. 2, part 7 (1822) 16; Cogn. in DC. Monog. Phan. 7 (1891) 510.

Kuching and Mount Penrissen, *Nos. 168, 214, 220*, at low altitudes. Sumatra and Java, not previously recorded from Borneo.

SONERILA MACRANTHA sp. nov. § *Genuinae, Caulescentes.*

Suffrutex erectus, ramosus, circiter 30 cm altus, inflorescentiis pilis capitatis paucis instructis exceptis glaber, ramis teretibus, pallidis, laevis, ad 2 mm diametro; foliis in paribus subaequalibus, membranaceis, olivaceis vel purpureis, ovatis ad oblongo-ovatis, 2 ad 3 cm longis, 1 ad 2 cm latis, margine deorsum integris, sursum argute serratis, dentibus lanceolatis, acuminatis, adscendentibus, utrinque 8 and 10, apice acutis vel acute acuminatis, basi acutis ad rotundatis, 3-nerviis; petiolo tenui, 1 ad 3 cm longo; inflorescentiis terminalibus, pedunculatis, pilis paucis patulis capitato-glandulosis 1 mm longis instructis, 6 ad 8 cm longis, paucifloris; calyce circiter 7 mm longo, breviter lobato; petalis 3, ellipticis, acutis vel breviter acuminatis, circiter 2 cm longis et 12 mm latis; antheris lanceolatis, acutis vel breviter acuminatis, circiter 7 mm longis; fructibus 1 cm longis, circiter 7 mm diametro, deorsum angustatis.

Mount Murud, Nos. 74, 75 (type), 76 78, E. Mjöberg, October, 1922, from altitudes between 1900 and 2400 m.

A species belonging in the group with *Sonerila impatiens* Becc., characterized by its very large flowers.

SONERILA sp. ?

Mount Murud, No. 77, a single imperfect specimen.

SONERILA sp.

Mount Dulit, No. 13. There are no complete flowers, the specimen being imperfect.

ANPLECTRUM A. Gray.

ANPLECTRUM *CYANOCARPUM* (Blume) Triana, Merr. Enum. Born. Pl. (1921) 443.

Mount Poi, No. 141, a fruiting specimen from near the foot of the mountain. Sumatra and Java.

ANPLECTRUM *HOMOEANDRUM* Stapf, Merr. Enum. Born. Pl. (1921) 443.

Mount Murud, No. 96, altitude above 1900 m. A species previously known only from Mount Kinabalu unless the Philippine *Medinilla ramiflora* Merr. proves to be conspecific. It is doubtful whether the present species should be retained in *Anplectrum* or transferred to *Medinilla*.

POGONANTHERA Blume.

POGONANTHERA PULVERULENTA Blume, Merr. Enum. Born. Pl. (1921) 446.

Kuching, No. 167, at low altitudes. Malay Peninsula, Sumatra and Java.

MEDINILLA Gaudichaud.

MEDINILLA HASSELTII Blume in Flora 14 (1831) 513; Cogn. in DC. Monog. Phan. 7 (1891) 586.

Mount Dulit, No. 10, altitude about 1200 m. Malay Peninsula to Sumatra, Java, Basilan, and Panay.

MEDINILLA sp.

Mount Poi, No. 158, an imperfect specimen with detached inflorescences and no complete flowers.

PTERNANDRA Jack.

PTERNANDRA LATIFOLIA (Blume) Triana, Merr. Enum. Born. Pl. (1921) 452.

Kuching, *s.n.*, at low altitudes. Malay Peninsula, Penang, Bangka.

ERICACEAE.

RHODODENDRON Linnaeus.

RHODODENDRON CUNEIFOLIUM Stapf var. *subspathulatum* Ridl., Merr. Enum. Born. Pl. (1921) 461.

Mount Murud, No. 98, above an altitude of 1900 m. Known only from Borneo.

RHODODENDRON JASMINIFLORUM Hook. in Curtis' Bot. Mag. 76 (1850) t. 4524.

Mount Murud, Nos. 103, 104, from between the altitudes of 1900 and 2400 m. Not previously reported from Borneo, occurring on the higher mountains in the Malay Peninsula, and Sumatra, and is also reported from Java. The Bornean form has entirely sessile leaves.

RHODODENDRON MJÖBERGII sp. nov.

Frutex vel arbor parva, perspicue castaneo-lepidotis; ramulis teretibus, 3 mm diametro, lepidotis; foliis oppositis, sessilibus vel brevissime pedicellatis, coriaceis, oblongo-ovatis ad oblongo-ellipticis, breviter acuminatis, basi late rotundatis, cordatis, supra parce subtus densissime castaneo-lepidotis, 5 ad 8 cm longis, 3 ad 4 cm latis, costa supra impressa, subtus valde prominulis, nervis lateralibus utrinque circiter 6, patulis, tenuibus, arcuato-anastomosantibus, indistinctis; floribus terminalibus, umbellatis, circiter 10, ut videtur aurantiacis, circiter 2.4 cm longis, pedicellis densissime castaneo-lepidotis; corollae tubo cylindrico, 1.6 cm longo, 4 mm diametro, glabro, lobis obovatis, rotundatis, 8 mm longis; staminibus 10, filamentis inaequalibus, deorsum leviter pubescentibus, sursum glabris; antheris oblongis, 2 mm longis; ovario cylindrico, densissime lepidoto, 6 mm longo; stylo 5 mm longo, deorsum lepidoto, sursum glabri.

Mount Murud, No. 105, E. Mjöberg, October, 1922, from between the altitudes of 1900 and 2400 m.

A species belonging in the general group with *Rhododendron malayanum* Jack, but with totally different vegetative characters, easily recognisable by its sessile cordate leaves.

RHODODENDRON MURUDENSE sp. nov.

Frutex glaberrimus, ramulis teretibus, in siccitate atris, 4 mm diametro; foliis alternis, crassissime coriaceis, oblongis ad oblongo-ellipticis, 13 ad 16 cm longis, 4.5 ad 7 cm latis, obtusis, basi acutis, nervis primariis utrinque circiter 15, subtus distinctis, arcuato-anastomosantibus; petiolo crasso, circiter 1 cm longo; floribus numerosis (circiter 20), 4 cm longis, subcampanulato-infundibuliformibus, tubo 1.6 cm longo, lobis late ovatis, rotundatis, 2.5 cm longis, pedicellis glabris, 2.5 cm longis; staminibus 10, filamentis inaequalibus, deorsum dense albido-lanatis, sursum glabris, antheris ellipsoideis, 3 ad 3.5 mm longis; ovario cylindrico, glabro, 4 mm longo, stylo 3 mm longo.

Mount Murud, No. 106, E. Mjöberg, from above an altitude of 1900 m. October, 1922.

This does not appear to be referable to any of the described Bornean forms, and comes closest to *Rhododendron javanicum* Blume, from which it differs notably in its short styles. The flowers appear to be red in colour.

RHODODENDRON VARIOLOSUM Becc., Merr. Enum. Born. Pl. (1921) 463.

Mount Poi, s.n., altitude about 1500 m. Known only from Mount Poi, the type locality, and apparently closely allied to *Rhododendron malayanum* Jack.

VACCINIUM Linnaeus.

VACCINIUM PACHYDERMUM Stapf, Merr. Enum. Born. Pl. (1921) 467.

Mount Murud, No. 108, from altitudes between 1900 and 2400 m. Previously known only from Mount Kinabalu.

VACCINIUM sp.

Mount Murud, No. 110. A very characteristic species with caudate-acuminate leaves and lax racemes, probably undescribed, but the material available insufficient.

VACCINIUM sp.

Mount Murud, No. 109, a sterile specimen.

MYRSINACEAE.

ARDISIA Swartz

ARDISIA HUMILIS Vahl, Merr. Enum. Born. Pl. (1921) 470.

Mount Poi, No. 153, near the foot of the mountain. India to Malaysia as interpreted by Mez. The proper name for this form is doubtful. It may prove to be *A. littoralis* Andr.

ARDISIA LEPIDOTULA Merr., Merr. Enum. Born. Pl. (1921) 471.

Mount Poi, No. 185, at or above an altitude of 1500 m. The type locality.

ARDISIA MJÖBERGII sp. nov. § *Stylardisia*.

Frutex vel arbor parva, inflorescentiis dense minute castaneo-furfuraceis subtus foliis dense castaneo-lepidotulis exceptis glaber, ramis teretibus, glabris; foliis coriaceis vel subcoriaceis, integris, oblongis ad oblongo-lanceolatis, 5 ad 10 cm longis, 2 ad 3 cm latis, laevis, opacis, in siccitate brunneo-olivaceis, utrinque subaequaliter angustatis, basi acutis, apice obtuse acuminatis, subtus parce punctato-

glandulosus; nervis primariis utrinque circiter 16, tenuibus, subtus distinctis; petiolo 3 ad 7 mm longo; inflorescentiis terminalibus, tripinnatim paniculatis, circiter 12 cm longis, multifloris, minute castaneo-furfuraceis, ramis primariis paucis, floribus in ramulis ultimis umbellatim dispositis, umbellis 5- ad 8-floris; pedicellis circiter 3 mm longis, tenuibus; sepalis oblongo-ovatis, acutis vel obtusis, 1.5 mm longis, haud imbricatis, margine ciliatis glandulis paucis (2 ad 5) magnis praeditis; petalis ovatis ad oblongo-ovatis, acuminatis, 2.5 ad 3 mm longis, eglandulosus; antheris late ovatis, 1.5 mm longis, dorso haud punctatis; ovarium glabrum.

Mount Murud, No. 80, E. Mjöberg, October, 1922, between the altitudes of 1900 and 24 m.

A species probably belonging in *Stylardisia* rather than in *Acrardisia*, although in but few of the flowers are the styles exerted before anthesis. Its alliance is with *Ardisia synneura* Scheff. but it has smaller leaves, ample many flowered inflorescences, and prominently glandular-punctate sepals.

ARDISIA OBOVATIFOLIA sp. nov. § *Akosmos*.

Frutex, inflorescentiis exceptis glaber, ramulis teretibus, 5 mm diametro; foliis plus minusve confertis, obovatis, integerrimis, apice latissime rotundatis interdum late acutis, deorsum contractis, basi cuneatis, subcoriaceis, olivaceis, brevissime petiolatis, circiter 15 cm longis et 8 cm latis, utrinque glabris, margine arcte revolutis, nervis utrinque circiter 15, patulis, subtus distinctis; petiolo crasso, vix 5 mm longo; inflorescentiis axillaribus, minute castaneo-puberulis, bipinnatim paniculatis, circiter 10 cm longis, ramis primariis paucis, patulis, inferioribus circiter 2 cm longis, floribus umbellatim dispositis, umbellis 5- ad 8-floris, pedicellis sursum incrassatis, circiter 9 mm longis; sepalis apertis, ovatis, obtusis ad acutis, 1 mm longis, margine ciliatis, glandulis magnis paucis praeditis; petalis lanceolatis, acuminatis, 4 ad 5 mm longis, parce glandulosus, glandulis magnis; antheris lanceolatis, acuminatis, 2.5 ad 3 mm longis, dorso eglandulosus; ovarium glabrum.

Mount Murud, No. 79, E. Mjöberg, October, 1922, above an altitude of 1900 m.

A species strongly characterized by its obovate leaves which are usually broadly rounded or sometimes broadly acute at their apices. The margins are entire and narrowly revolute. In none of the flowers examined are the styles exerted before anthesis; after anthesis they are 3 to 5 mm in length.

ARDISIA sp.

Mount Poi, No. 184, an imperfect specimen in the section *Tinopsis*.

LABISIA Lindley.

LABISIA PUMILA (Blume) Benth. & Hook. f. var. *lanceolata* (Scheff.) Mez, Merr. Enum. Born. Pl. (1921) 473.

Near Kuching, No. 213, at low altitudes. Indo-China to Malaysia.

EMBELIA Burman f.

EMBELIA RIBES Burm. f., Merr. Enum. Born. Pl. (1921) 476.

Kuching, No. 164, at low altitudes. India to southern China, Java, Borneo, and Sumatra.

Symplocaceae.

SYMPLOCOS Jacquin.

SYMPLOCOS DOLICHANTHA sp. nov. § *Cordyloblaste*.

Arbor parva, ramulis junioribus inflorescentiisque cinereo-pubescentibus exceptis glabra, ramulis pallidis circiter 2.5 mm diametro; foliis chartaceis, olivaceis, nitidis, integris, oblongo-ellipticis, circiter 16 cm longis et 7 cm latis, acuminatis, basi cuneatis, costa supra impressa, nervis primariis utrinque circiter 10, subtus perspicuis, arcuato-anastomosantibus, reticulis laxis, distinctis; petiolo crasso, circiter 6 mm longo; inflorescentiis in axillis superioribus, brevibus, paucifloris; floribus paucis, 4 ad 4.3 cm longis, cylindraceis, calycis tubo circiter 5 mm longo, lobis ovatis, obtusis, 3 mm longis, dense adpresse pubescentibus; petalis extus dense cinereo-pubescentibus, circiter 4 mm latis, sursum liberis, deorsum cum tubo connatis: tubo stamineo circiter 3.5 cm longo, cylindrico, glabro, filamentis (partibus liberis) 1 ad 3 mm longis numerosissimis; ovario 3-loculari

Mount Murud, No. 120, E. Mjöberg, between the altitudes of 1900 and 2400 m., October, 1922.

A very strongly marked species of the small section *Cordyloblaste*, among all the described species at once distinguished by its large leaves and unusually long flowers. The very numerous anthers cover the upper 1.5 to 2 cm of the tube and terminate its short free segments.

SYMPLOCOS MJÖBERGII sp. nov. § *Bobua*, *Lodhra*.

Arbor parva, ramulis et inflorescentiis et foliis subtus ad costa nervisque longe ferrugineo-pilosis, ramulis circiter 4 mm diametro; foliis chartaceis vel subcoriaceis, oblongis integris, supra viridibus, nitidis, glabris, perspicue acuminatis, basi late rotundatis et obscure cordatis, 9 ad 10 cm longis, 4 cm latis, costa supra impressa, margine dense ferrugineo-villosis; nervis primariis utrinque circiter 9, supra impressis, subtus valde perspicuis, arcuato-anastomosantibus, laxe reticulatis; petiolo dense ferrugineo-villoso, vix 2 mm longo; inflorescentiis axillaribus, paniculatis vel minoribus racemosis, 2.5 ad 6 cm longis, dense ferrugineo-villosis, ramis primariis paucis, usque ad 2 cm longis; floribus circiter 9 mm diametro, calycis tubo villosa, 2 mm longo, lobis patulis, elliptico-ovatis, 2 mm longis, pubescentibus; petalis 5, liberis, ellipticis, glabris, 5 mm longis; staminibus numerosis, filamentis liberis, glabris, 3 ad 5 mm longis; ovario 3-loculari.

Mount Murud, No. 97, E. Mjöberg, between the altitudes of 1900 and 2400 m., October, 1922.

A very strongly marked species, well characterized by its copious, long, ferruginous indumentum; its rounded-cordate, acuminate, prominently nerved leaves; and by its axillary panicles which are at times about one half as long as the leaves.

SYMPLOCOS RUBIGINOSA Wall., Merr. Enum. Born. Pl. (1921) 488.

Mount Poi, No. 180. The specimen is imperfect but is probably referable here, although the inflorescences are only slightly longer than the petioles. Malay Peninsula to Sumatra and Borneo.

LOGANIACEAE.

FAGRAEA Thunberg.

FAGRAEA OBOVATA Wall. in Roxb. Fl. Ind. 2 (1824) 33.

Mount Murud, *No. 94*, at or above an altitude of 1900 m. An exceedingly variable species of wide distribution in the Indo-Malaysian region.

APOCYNACEAE.

LEUCONOTIS Jack.

LEUCONOTIS sp.

Mount Murud, *No. 124*, from above an altitude of 1900 m. A single imperfect specimen with no mature flowers.

ALSTONIA R. Brown.

ALSTONIA ANGUSTIFOLIA Wall., Merr. Enum. Born. Pl. (1921) 497.

Near Kuching, *No. 210*, at low altitudes. Malay Peninsula.

ALYXIA R. Brown.

ALYXIA LUCIDA Wall., Merr. Enum. Born. Pl. (1921) 499.

Santubong, *s.n.*, and Mount Poi, *No. 181* (var. *meiantha* Stapf). Malay Peninsula to Sumatra and the Philippines.

ASCLEPIADACEAE.

HOYA R. Brown.

HOYA sp.

Mount Pentrissen, *No. 217*, altitude about 1300 m.

DISCHIDIA R. Brown.

DISCHIDIA MICROPHYLLA Schltr., Merr. Enum. Born. Pl. (1921) 505.

Kuching, *No. 169*, at low altitudes. Previously known only from Dutch Borneo.

CONVOLVULACEAE.

MERREMIA Dennstaedt.

MERREMIA UMBELLATA (Linn.) Hallier f. var. *orientalis* Hallier f., Merr. Enum. Born. Pl. (1921) 509.

Lundu, No. 232. Pantropic in distribution.

VERBENACEAE.

LANTANA Linnaeus.

LANTANA CAMARA Linn., Merr. Enum. Born. Pl. (1921) 511.

Kuching, s.n. Pantropic; of American origin.

VITEX Linnaeus.

VITEX NEGUNDO Linn., Merr. Enum. Born. Pl. (1921) 514.

Lundu, No. 234, April, 1924. Widely distributed in the Old World tropics.

CLERODENDRON Linnaeus.

CLERODENDRON FISTULOSUM Becc., Merr. Enum. Born. Pl. (1921) 516.

Near Kuching, No. 208. Known only from Borneo.

CLERODENDRON INFORTUNATUM Linn.? Merr. op. cit. 517.

Near Kuching, No. 173. India through Malaysia to the Moluccas.

LABIATAE.

COLEUS Loureiro.

COLEUS sp.

Lundu, s.n., a single fragmentary specimen insufficient for further identification.

SCROPHULARIACEAE.

LINDERNIA Allioni.

LINDERNIA LATIFOLIA (Blume) Koord. Exkursionsfl. Java 3 (1912) 179.

Diceros latifolius Blume Bijdr. (1826) 752.

Vandellia latifolia Benth. in DC. Prodr. 10 (1846) 415.

Mount Matang, No. 202, July 7, 1924, altitude about 300 m.

A species previously known only from Java and of which a no more complete description has been published than Blume's original very short and imperfect one. From this description, and Koorders' note on Blume's type, it is clear that the specimen cited above really represents this species, which, as Koorders notes, is widely different from the other species of the genus in its habit; it is, nevertheless, a true *Lindernia*. The largest leaves on the specimen cited are 12 cm long and 4.5 cm wide, distinctly larger than in Blume's type, which has leaves 6 to 8 cm long.

GESNERIACEAE.

DIDYMOCARPUS Wallich.

Didymocarpus crinita Jack, Merr. Enum. Born. Pl. (1921) 527.

Mount Poi, No. 191, altitude about 1400 m. Malay Peninsula and Sumatra.

Var. *EXASPERATA* Clarke, Merr. l.c.

Mount Matang, *s.n.*, altitude about 300 m. Borneo.

DIDYMOCARPUS LONGIPETIOLATUS sp. nov. § *Loxocarpus*.

Subcaulis, foliis confertis, longe (2 ad 7 cm) petiolatis, ovatis ad elliptico-ovatis, chartaceis vel subcoriaceis, 3 ad 5.5 cm longis, 2 ad 3.3 cm latis, basi late rotundatis, interdum leviter cordatis, apice acutis, margine obscure crenulato-serrulatis, supra densissime adpresse pallide villosis, subtus praesertim ad costa nervisque densissime pallide villosis, nervis primariis utrinque 4 ad 6, subtus perspicuis; pedunculis tenuibus, adpresse albedo-villosis, ad apicem plerumque dichotomis vel trichotomis, 12 ad 20 cm longis, 6- ad 20-floris; floribus confertis, bracteis lanceolatis, villosis, circiter 5 mm

longis; sepalis subliberis, oblongo-lanceolatis, obtusis, ciliatis, 2 mm longis; corolla 6 ad 7 mm longa, circiter 8 mm diametro, lobis 5, oblongis ad oblongo-ovatis 3 ad 3.5 mm longis; filamentis 3 mm longis, antheris subglobosis; ovario villosa cum stylo 6 mm longo.

Mount Poi, No. 190, E. Mjöberg, altitude above 1500 m.

A species allied to *Didymocarpus rufescens* C. B. Clarke but with more numerous flowers, the flower bearing parts of the inflorescences not exceeding 3 cm in length, acute leaves, very much longer petioles, smaller flowers and pale, not rufous indumentum.

DIDYMOCARPUS SCABRINERVIA C. B. Clarke, Merr. Enum. Born. Pl. (1921) 528.

Mount Poi, No. 192, altitude about 1500 m. Known only from Borneo.

DIDYMOCARPUS TERES C. B. Clarke, Merr. l.c.

Kuching, No. 171, at low altitudes. Known only from Sarawak.

DIDYMOCARPUS spp.

Mounts Matang, Dulit, and Murud, Nos, 9, 86, 204, representing three distinct species but the specimens are all too imperfect to warrant identification beyond the genus.

BOEA Commerson.

BOEA BRETTIANA W. W. Sm., Merr. Enum. Born. Pl. (1921) 529.

Bidi Caves, s.n., June. Known only from Sarawak.

TRICHOSPORUM D. Don.

TRICHOSPORUM LOBBIANUM (Hook.) O. Kuntze, Merr. Enum. Born. Pl. (1921) 530.

Mount Dulit, No. 17, altitude about 1200 m. Malay Peninsula, Sumatra, and Java.

TRICHOSPORUM LONGIFLORUM (Blume) O. Kuntze, Rev. Gen. Pl. (1891) 477.

Lysionotus longiflorus Blume Bijdr. (1826) 766.

Aeschynanthus longiflorus DC., C. B. Clarke in DC. Monog. Phan. 5 (1883) 32.

Mounts Poi and Penrissen, *No. 188, s.n.* The specimens agree very closely with the descriptions and figures of this species which was previously known only from Java. The leaves are more slenderly acuminate than in the Javan form, while the pedicels are somewhat shorter and the sepals slightly longer.

TRICHOSPORUM MJÖBERGII sp. nov. § *Holocalyx*.

Frutex scandens, glaber, ramulis 2 ad 3 mm diametro; foliis crasse coriaceis, ellipticis ad oblongo-ellipticis, 7 ad 11 cm longis, 3 ad 5 cm latis, basi acutis, apice perspicue acuminatis, nervis lateralibus circiter 6, curvato-adscedentibus, tenuibus, valde obscuris vel obsoletis; petiolo crasso, 5 ad 10 mm longo; inflorescentiis bifloris, terminalibus; floribus permagnis, 8 ad 9 cm longis, leviter curvatis, glabris; calyce 2.5 cm longi, deorsum angustati, lobis oblongo-ovatis, acutis vel obtusis, 5 mm longis; corolla sursum ampliata, leviter curvata, ore puallo obliquo, lobis orbiculari-obovatis, circiter 1 cm diametro, margine leviter ciliatis; antherae vix exsertae, 3 ad 4 mm longae, filamentae sursum parcellissime ciliatae.

Mount Murud, *No. 81, 89* (type) E. Mjöberg, October, 1922, at or above an altitude of 1900 m.

A remarkably distinct species on account of its very large flowers, the upper part of the corolla tube, when flattened, being from 1.5 to 2 cm in width. The calyx lobes are about one-fifth the length of the tube. The ovary and style are glabrous, except the sparingly pubescent upper 6 mm of the latter, the large capitate stigma being about 3.5 mm in diameter.

TRICHOSPORUM OBCONICUM (C. B. Clarke) O. Kuntze, Merr. Enum. Born. Pl. (1921) 531.

Mount Poi, *No. 189, s.n.*, above an altitude of 1500 m. Malay Peninsula.

DICHROTRICHUM Reinwardt.

DICHROTRICHUM STENOPHYLLUM sp. nov.

Frutex scandens, ut videtur epiphyticus, caulis repens, radicans, 5 mm diametro; foliis glabris, ut videtur carnosis, in siccitate coriaceis, fragilis, anguste oblanceolatis, circiter 25 cm longis, 4 cm latis, tenuiter acute acuminatis, deorsum

longe angustatis, margine sursum irregulariter denticulatis, deorsum integris, nervis primariis utrinque circiter 10, obscuris; petiolo crasso, 6 ad 8 cm longo; inflorescentiis axillaribus, 6 ad 7 cm longis, paucifloris, subcymosis, sessilibus vel breviter pedunculatis; bracteis lanceolatis, acuminatis, 1.8 ad 2.5 cm longis, 4 ad 8 mm latis, leviter pilosis; floribus circiter 4 cm longis, ut videtur coccineis, curvatis; sepalis liberis, lanceolatis, leviter pubescentibus, plerumque acutis vel obtusis; corolla sursum inflata, leviter curvata, ore oblique, lobi superiores erecti, orbiculari vel suborbiculari, 2 ad 3 mm diametro, inferiores patenti, longiores; filamentis glabris, longe (circiter 2 cm) exsertis.

Mount Dulit, *No. 18*, E. Mjöberg, January, 1923, above an altitude of 1200 m.

A species radically different from the other described species in this genus in its narrow, elongated, oblanceolate leaves. It is not closely allied to any previously described form.

MONOPHYLLEA R. Brown.

MONOPHYLLEA BECCARII C. B. Clarke, Merr. Enum. Born. Pl. (1921) 533.

Bidi Caves, *No. 174*. Known only from Sarawak.

MONOPHYLLEA LOWEI C. B. Clarke, Merr. l.c.

Bidi Caves, *No. 176*. Known only from Borneo.

MOULTONIA Balfour and W. W. Smith.

MOULTONIA SINGULARIS Balf. and W. W. Sm., Merr. Enum. Born. Pl. (1921) 533.

Bidi Caves, *s.n.* A monotypic genus known only from Sarawak.

EPITHEMA Blume.

EPITHEMA sp.

Bidi Caves, *No. 175*, material imperfect.

CYRTANDRA Forster.

CYRTANDRA sp.

Mount Penrissen, *s.n.* A single specimen without flowers or fruits.

ACANTHACEAE.

HALLIERACANTHA Stapf.

HALLIERACANTHA GRANULATA Stapf, Merr. Enum. Born. Pl. (1921) 541.

Lundu, No. 228. The type locality. Known only from this region. There are four other numbers representing this family in the collection, but flowers are lacking in each case so that I cannot carry the determinations to the genera with safety.

RUBIACEAE.

XANTHOPHYTUM Blume.

XANTHOPHYTUM CAPITATUM Valetton, Merr. Enum. Born. Pl. (1921) 543.

Mount Poi, *s.n.*, near the foot of the mountain. Previously known only from Dutch Borneo.

OLDENLANDIA Linnaeus.

OLDENLANDIA CORYMBOSA Linn., Merr. Enum. Born. Pl. (1921) 544.

Lundu, No. 231. Pantropic, but probably introduced in the American tropics.

HEDYOTIS Linnaeus.

HEDYOTIS CAPITELLATA Wall., Merr. Enum. Born. Pl. (1921) 545.

Mount Poi, No. 149, near the foot of the mountain. Malay Peninsula and Archipelago.

HEDYOTIS TETRANGULARIS (Korth) Miq.?, Merr. op. cit. 547.

Mount Matang, *s.n.*, altitude 300 m. The identify of this with the above species is doubtful. It is known only from Borneo.

HEDYOTIS SUBCAULIS sp. nov. § *Diplophragma*.

Planta parva, suffruticosa, circiter 6 cm alta, glabra, caulis 1 mm diametro, teretibus, vix 1 cm longis, haud ramosis; foliis numerosis densissime confertis, lanceolatis, laevis,

viridibus, subtus pallidioribus, breviter petiolatis, 1.5 ad 4 cm longis, 4 ad 6 mm latis, chartaceis, acuminatis, basi acutis, nervis lateralibus utrinque circiter 3, ascendentibus, valde obscuris vel obsoletis; petiolo circiter 2 mm longo; stipulis lanceolatis, acuminatis, 2 ad 2.5 mm longis, parce laceratolobatis, lobulis glandulosis; cymis axillaribus, tenuiter pedunculatis, paucifloris, dichotomis, circiter 5 cm longis; floribus 8 mm longis, pedicellis tenuibus, 1 ad 2 mm longis, bracteis lineari-lanceolatis, pedicellis subaequantibus; calycis tubo tereti, 1.5 mm longo, lobis oblongo-ovatis, subobtusis, 1 ad 1.2 mm longis; corollae tubo 4 mm longo, glabro, sursum leviter ampliato, lobis elliptico-ovatis, 2.5 ad 3 mm longis, obscurissime ciliatis; capsulis ellipsoideis, 3.5 mm longis, septicide dehiscentibus, apice inter lobis haud protrusis, seminibus parvis, atris numerosis.

Mount Matang, E. Mjöberg, *s.n.*, July 7, altitude about 300 m. This small species is strongly characterized by its very short simple stems which do not exceed 1 cm in length and which are leafy throughout, the lanceolate leaves being very densely crowded.

ARGOSTEMMA Wallich.

ARGOSTEMMA BORAGINEUM Blume var. *rotundifolium* Valetton, Merr. Enum. Born. Pl. (1921) 549.

Mounts Matang and Penrissen, *s.n.*, 218, at medium altitudes. Malay Peninsula, Sumatra, Java.

ARGOSTEMMA DULITENSE sp. nov.

Suffruticosa, erecta, simplex, circiter 28 cm alta, caulis in partibus foliiferis adpresse hirsutis exceptis glabra; caulis circiter 2.5 mm diametro, stricte erectis, partibus inferioribus (circiter 15 cm) defoliatis, glabris, internodiis circiter 1 cm longis, in partibus superioribus foliis oppositis numerosis ferentibus; foliis in paribus valde inaequalibus, majoribus oblongo-ellipticis ad oblongo-lanceolatis, subcoriaceis, olivaceis, 3 ad 4.5 cm longis, 3 ad 4.5 cm longis, 1 ad 1.5 cm latis, utrinque circiter 15, patulis haud distinctis, petiolo circiter 3 mm longo; foliis minoribus stipulaeformibus, subsessilibus, subellipticis, 5 ad 7 mm longis; stipulis coriaceis, late ovatis, obtusis ad acutis, 5 ad 7 mm longis; inflorescentiis terminalibus, paucifloris, tenuibus, circiter 5 cm longis, solitariis vel binis, plerumque 2- vel 3-floris; floribus magnis,

umbellatis, longe (1.5 ad 2.5 cm) pedicellatis, 5-meris, albidis, circiter 2.5 cm diametro; sepalis lanceolatis, acuminatis, 2 ad 2.5 mm longis, petalis late lanceolatis, acutis, circiter 13 mm longis, et 4 mm latis.

Mount Dulit, No. 8, E. Mjöberg, between the altitudes of 1200 and 1500 m., January, 1923.

Strongly characterized by being entirely glabrous throughout except for the appressed-hirsute leafy parts of the erect simple stems; by its very unequal leaves which are numerous and crowded on the upper half of the stems; and by its lax, few flowered inflorescences, the flowers being unusually large in the genus.

Another species in the general group with *Ixora fulgens* Roxb., but with sessile leaves which are narrowed below the middle to the abruptly rounded or obtuse base, the base varying from 1 to 2.5 cm in width. The almost setiform tips of the stipules are about 7 mm in length.

IXORA STENOPHYLLA (Korth.) O. Kuntze Rev., Gen. Pl. (1891) 287; Ridl. in Trans. Linn. Soc. Bot. 3 (1893) 311;

Valeton in Engl. Bot. Jahrb. 44 (1910) 562; Merr. Enum. Born. Pl. (1921) 572.

Lundu and Mount Poi, Nos. 198, 235. Malay Peninsula.

The specimens agree with Korthals' brief description and also fairly well with Ridley's incomplete one (Fl. Malay Penins. 2, 94 (1923)). The type was from Southern Borneo, and the transfers of the specific name, made independently by O. Kuntze, Ridley, and Valeton, were all based on *Pavetta stenophylla* Korth. From Miquel's ample description of *Pavetta polita* (*Ixora polita* Boerl.) it is clear that the latter has little in common with *Ixora stenophylla* O. Kuntze as interpreted here and by Ridley.

IXORA TRICHOBOTRYS sp. nov.

Frutex (vel arbor parva?) inflorescentiis leviter pubescentibus exceptis glaber, ramulis subteretibus, circiter 2.5 mm diametro, pallidis, foliis chartaceis, oblongis, in siccitate pallidis, nitidis, 15 ad 23 cm longis, 5 ad 7 cm latis, perspicue acute acuminatis, deorsum angustatis, basi cuneatis; nervis primariis utrinque 16 ad 18, utrinque perspicuis, arcuato-anastomosantibus, reticulis laxis; petiolo 1 cm longo; stipulis circiter 1 cm longis, partibus inferioribus late ovatis, abrupte contractis et longe setoso-acuminatis; inflorescentiis

terminalibus, sessilibus vel brevissime pedunculatis, dense multifloris, circiter 6 cm diametro, leviter pubescentibus, ramis primariis paucis, patulis, circiter 1 cm longis, bracteis lineari-lanceolatis, leviter pubescentibus, acuminatis, 3 ad 5 mm longis, bracteolis similis, minoribus, vix 2 mm longis; floribus tenuibus, circiter 1.8 cm longis, in ramulis ultimis in triadibus dispositis, interioribus sessilibus, exterioribus distincte pedicellatis, pedicellis 2 ad 3.5 mm longis; calyce 1.5 mm longo, tubo ovoideo, glabro, vix 9.5 mm longo, lobis 4, lanceolatis, acuminatis, quam tubo duplo longioribus, glabris vel obscure pubescentibus; corollae tubo circiter 1.7 cm longo, glabro, lobis oblongo-lanceolatis, acutis vel obtusis, circiter 5 mm longis.

Lundu, Mount Gadin, No. 225, E. Mjöberg, May 24, altitude about 600 m.

A species well characterized among the Malaysian forms with the calyx lobes longer than the calyx tube by its sessile or subsessile, densely flowered, sparingly pubescent cymes, its prominently nerved leaves, and its slender flowers. It apparently belongs in the group with *Ixora multibracteata* Pearson.

PSYCHOTRIA Linnaeus.

PSYCHOTRIA ROBUSTA Blume, Merr. Enum. Born. Pl. (1921) 575.

Mount Poi, No. 146, near the foot of the mountain. Java.

CAMPANULACEAE.

PENTAPHRAGMA Wallich.

PENTAPHRAGMA ALBIFLORUM Pearson, Merr. Enum. Born. Pl. (1921) 585.

Santubong and Mount Poi, Nos. 162, 187, the latter number with much larger leaves than the former but clearly representing the same species. Known only from Borneo.

PENTAPHRAGMA OBTUSIFOLIUM sp. nov.

Suffruticosa, erecta, partibus junioribus floribusque perspicue stellato-furfuraceis; foliis coriaceis, late elliptico-ovatis, 9 ad 16 cm longis, 7 ad 12 cm latis, apice latissime rotundatis, basi late acutis, equilateralibus vel subequilateralibus, supra glaberrimis, olivaceis, subtus pallidioribus, disperse stellato-furfuraceis, margine deorsum integris, sursum crenatis vel

crenulatis, nervis primariis utrinque 3 vel 4, distinctis, adscendentibus; petiolo stellato-furfuraceo, circiter 3 cm inflorescentiis paucifloris axillaribus, haud scirpoideis, floribus fasciculatis vel depauperato-racemosis, bracteis, oblongo-ovatis, stellato-furfuraceis, circiter 13 mm longis et 6 mm latis, acutis vel obtusis, pedicellis crassis, usque ad 4 mm longis, densissime furfuraceis; calycis tubo 8 ad 9 mm longo, oblongo-obovoideo vel subcylindraco, circiter 6.5 mm diametro, extus stellato-furfuraceo; sepalis 5, oblongis, obtusis, extus stellato-furfuraceo, 8 mm longis, 2.5 ad 3 mm latis; petalis 5, ellipticis, obtusis, 11 mm longis, 6 mm latis, intus glabris, extus plus minusve stellato-furfuraceis; ovario 4- vel 5-loculare; filamentis 4 ad 5 mm longis, antheris haud visis; stylo crasso, cylindraco, 4 ad 5 mm longo.

Mount Murud, No. 112, E. Mjöberg, October, 1922, with a note "near the top," probably indicating an altitude approximately 1900 m.

A species strongly characterized by its stellato-furfuraceous indumentum, its nearly equilateral broadly rounded leaves, and its few flowered non-scorpoid inflorescences and relatively large flowers.

Attention is here called to the fact that among the species of the Malay Peninsula the name *Pentaphragma ellipticum* Poulsen in Kjoeb. Vidensk. Meddel. (1903) 321, t. 4, type from Singapore and Johore replaces *Pentaphragma ridleyi* King in Journ. As. Soc. Bengal 74, part 2 (1905) 57; Ridl. Fl. Malay Penins. 2 (1923) 202.

COMPOSITAE.

BLUMEA de Candolle.

BLUMEA AROMATICA (Wall.) DC. Prodr. 5 (1836) 446.

Mount Penrissen, No. 223, altitude about 1300 m. India to Malaysia but not previously recorded from Borneo.

VERNONIA Schreber.

VERNONIA CINEREA (Linn.) Less., Merr. Enum. Born. Pl. (1921) 586.

Lundu, No. 238. A pantropic weed probably of Old World origin.

SONCHUS Linnaeus.

SONCHUS ARVENSIS Linn., Merr. Enum. Born. Pl. (1921) 590.

Kuching, No. 165. A weed in most warm countries

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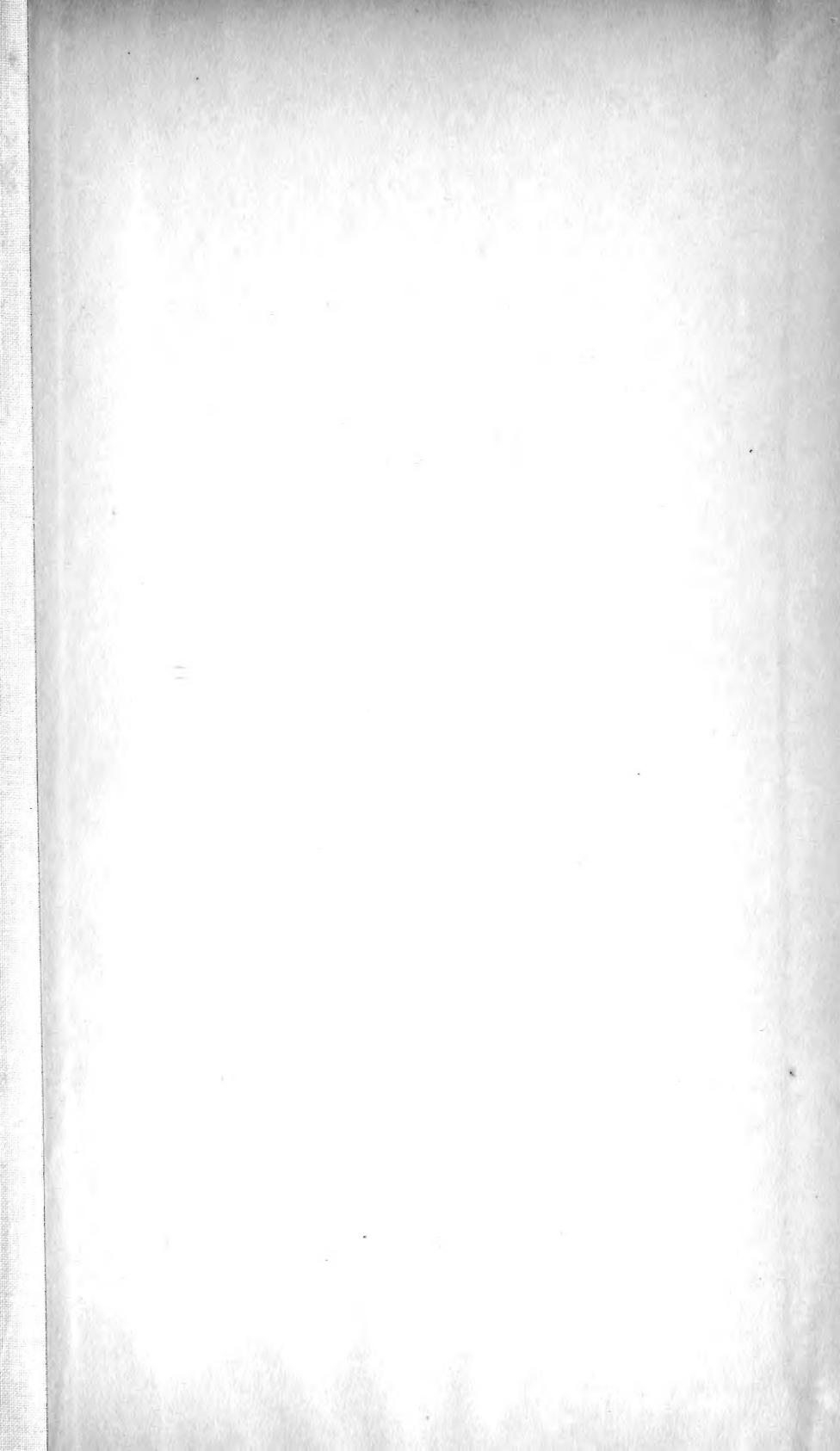
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