S. 320.

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DR. ERNST HARTERT, AND DR. K. JORDAN, F.R.S.

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CONTENTS OF VOLUME XXXIX (1933-36).

SIPHONAPTERA.

VERMES.

PLATES IN VOLUME XXXIX.

ERRATA.

P. 56, line 6 from below read Thomas instead of Thomat.

P. 61, line 1 from above read *gracilentus* instead of *gracilior*.

P. 66, line 4 from above read *Echidnophaga* instead of *Echidnophagc*.

P. 69, lines 1 and 28 from above read *Atyphloceras* instead of *Atyploceras*.

P. 71, line 5 from above read sclerified instead of sclarified.

P. 75, line 2 from below read *gilvus* instead of *gilous*.

P. 76, line 5 from above delete "at."

P. 78, line 20 from above read *bakeri* instead of *enderleini*.

P. 81, in explanation of Figs. 22 and 23 read *indcterminata* instead of *indcterminate*.

P. 82, line 18 from above read Camerun instead of Camerum.

P. 83, line 9 from below read *nigropunctata* instead of *migropunctata*.

P. 242, line 25 from above *Hyperthaema* instead of *Hyperthema*.

P. 245, line 14 from above read *Hemihyalea* instead of *Hemihyalia*.

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CONTENTS OF NO. I.

NOVITATES ZOOLOGICAE

Vol. XXXIX. OCTOBER 1933. No. 1.

ON THE GEOMETRID GENUS *PHRYGIONIS* HB.

By LOUIS B. PROUT.

THIS attractive genus has apparently received much less attention than might have been expected. In arranging the material in the Tring Museum, I have found several forms unnamed or wrongly determined and have been compelled, for my own guidance, to make some preliminary investigations. The present article, though not claiming to be a thorough systematic revision, embodies the principal results of these investigations and may, it is hoped, pave the way for some more exhaustive work.

The genus *Phrygionis* was erected by Hübner (*Verz. bek. Schmett.*, p. 307) for *cultaria* Hb. and two non-Geometrids, and was legitimately restricted by Warren (Nov. Zool. i, 399) to *cultaria*.[1] *Eulepidotus* H.-Sch. (*Samml. Aussereur. Schmett.*, i, 28, 41), admittedly a transcription (inaccurate) of *Eulepidotis* Hb., was based on a confusion of *politia* Cram. (now *Nepheloleuca*) with *polita* Cram. (now *Phrygionis*) and has no possible standing. *Byssodes* Guen. (*Spec. Gén. Lép.*, ix, 399) is purely a synonym of *Phrygionis*, its author having, as usual, ignored the *Verzeichniss* of Hübner. I have little doubt that Druce will prove to have been right in merging with it (*Biol. Centr.-Amer., Lep. Het.*, ii, 98–100, *Byssodes*) the group of white species, with longer tail to the hindwing, exemplified by *platinata* (Guen., *Spec. Gén. Lép.*, ix, 33 ; Oberth., *Et. Lép. Comp.*, v, fig. 482) ; but as this has been provided with a separate generic name (*Ratiaria* Walk., 1861) and represents a distinct section, I have abstained from introducing it into the present study—the more so since its inclusion would have led me still farther afield into systematics, perhaps even to an exploration of the whole of the so-called *Palyadinae*.

It is curious that Warren, in the article above cited, has transferred *Phrygionis* to his *Urapteryginae*, while correctly indicating (*t.c.*, p. 403) that the subfamily *Palyadinae*—tribe of the *Geometrinae* in the comprehensive Lederer-Meyrick system—" is characterized by the absence of the frenulum." Guenée, whom Warren approximately follows, places it correctly in the *Palyadinae*, and I surmise that Warren was misled as to the affinities by the remarkably *Oraptery*x-like colour and markings of the *Ratiaria* section. The phylogeny of the great Geometrine stirps—if indeed it be even a single stirps—is still very obscure,

[1] Butler's use of the name in *Tr. Ent. Soc. Lond.* 1879, p. 30, is fortunately entirely non-restrictive.

but I suspect that the *Palyas* group has arisen from the *Cabera* group by the loss of the frenulum.

Phrygionis is recognizable at a glance by its facies, in particular by the metallic proximal edging of the pale transverse bands and the partly metallic subterminal or terminal spot in front of R^3 of the hindwing; but the entire structure is pretty homogeneous. Face nearly smooth, or with small cone. Palpus shortish-moderate, upcurved. Tongue well developed. Antenna of ♂ shortly (only in *flavilimes* and *sumptuosaria* more) bipectinate, the pectinations neither continuing to the base nor to the apex. Legs long and slender. Thorax and abdomen not crested; abdomen in ♂ provided, except in *flavilimes* and *sumptuosaria*, with a pair of hair-pencils arising from near base of 6th tergite. Wings ample, smooth-scaled, except for the somewhat raised metallic markings; forewing smooth-margined, SC^1 from cell, anastomosing with C, SC^{2-5} stalked from much before end of cell, SC^5 separating long before SC^2; hindwing bent or shortly tailed in middle; humeral angle strong, frenulum wanting, C (after its strong basal angulation) approximated to SC to near middle of cell, then rapidly diverging, SC^2 separate, R^2 entirely wanting, M^1 separate.

A few of the species were known to the old authors, but their naming was on the whole very unfortunate. Of the pre-Guenée names, only *argentata* Drury (*Ill. Nat. Hist.*, ii, Index and p. 25, t. xix, fig. 2, 1773, Jamaica) and *cultaria* Hb. (*Verz. bek. Schmett.*, p. 307, nom. nov., pro *politata* Stoll) are even potentially valid. *Phalaena polita* Cram. (*Uitl. Kap.*, iii, 152, t. 276F, 1780, Surinam), though described as a "*Phal. Geom.*" and indexed as *polyta*, must, according to the present methods of registration, be considered as preoccupied by *Phalaena* (*Noctua*) *polita* Cram. (*op. cit.*, ii, 35), the indexing being presumably a misprint, not an intentional escape from homonymy, and the original spelling being retained by Stoll (*Essai*, p. 26, No. 51); *Ph. decorata* Fb. (*Spec. Ins.*, ii, 256, 1781, Jamaica) was a homonym, but I believe also synonymous with *argentata* Drury; *Ph. politata* Stoll (*Aanh. Uitl. Kap.*, p. 143, t. xxxi, fig. 4, 1790, "Surinam") was a misspelling and misidentification, being assumed to represent the ♂ to *polita* Cram., but it received a valid new name from Hübner (see above). Curiously enough, this last-cited figure, like Guenée's *paradoxata*, looks Antillean rather than South American, perhaps least unlike a badly coloured, badly shaped representation of *argentata* Drury, with postmedian line too proximal and the orange border of the hindwing narrowed à la *cruorata*; indeed I have no knowledge of *any* continental *Phrygionis* which has both the metallic spots of the hindwing placed on red patches, and this is one of the few characters on which the description and the figure are quite explicit. I can only suggest, therefore, that the figured specimen was of uncertain origin and that the words "and inhabits Surinam" were added to the description on the assumption that it was conspecific with *polita* Cram.

The Cuban species subsequently figured as *cultaria* (Hb.-Gey., *Zutr. Exot. Schmett.*, iv, 34, figs. 751–2, 1832) was obviously not that of the *Verzeichniss*, but may well be a small ♀ of the one that was later named *sororcula* by Warren, or possibly a dull *fratercula*. The "*cultaria* Geyer" with which Strecker compared his *argentistriata*, whatever it was, was certainly not "vera"; perhaps it was the common and widely distributed species which has generally been called *privignaria* or *paradoxata* (*incolorata* Prout subsp.).

Even Guenée's two "new species" (1858) are more than ordinarily unhelpful

in our quest of a stable nomenclature ; his *Byssodes paradoxata* (*Spec. Gén. Lép.*, ix, 400, " Brésil (?) " being a curious little ♂, unlike any other specimen which I have seen, the confluent red marking of the hindwing so Antillean that I suggest it may be a lost Haitian species close to *sororcula* Warr., just possibly a form of *sororcula* [1] ; his *B. privignaria* (*t.c.*, p. 401, Martinique) a lost ♂ from coll. Marchand not identifiable with anything now known either from the West Indies or elsewhere. He does us a service, however, in providing a new name *politulata* (*t.c.*, p. 400) for the preoccupied *polita* of Cramer ; although he cites " *politata* Cram." in mistake for *polita* and discusses Stoll's figure before Cramer's on p. 401 (doubtless because it was the ostensible ♂), the application of his new name is unequivocal, for he heads the species " *Byssodes politulata* Cram.," and it is well known that with him in such cases the new name is credited to the *original* author (cf. No. 161, " *Sicya sublimaria* Harr.").

The subsequently described species are more straightforward, although *sororcula* Warr. has not yet reached our British collections, so far as known to me. The following is a chronological list (original generic designation added when this was not *Phrygionis*) :

1861. *appropriata* Walk., *List Lep. Ins.*, xxii, 619 (*Byssodes*) (Mexico).

1861. *metaxantha* Walk., *op. cit.*, xxiii, 828 (*Ratiaria*) (Bogota) (pr. f.).

1876. *argentistriata* Streck., *Proc. Acad. Nat. Sci. Phil.*, xxviii, 152 (Florida).

1882. *cerussata* Grote, *Pap.*, ii, 101 (*Byssodes*) (Florida) (pr. syn.).

1882. *obrussata* Grote, *Can. Ent.*, xiv, 111 (err. pro *cerussata*).

1886. *sumptuosaria* Möschl., *Abh. Senck. Ges.*, xiv (3), 69, f. 25 (*Byssodes*) (Jamaica).

1904. *modesta* Warr., Nov. Zool., xi, 91 (Minas Geraes).

1905. *cruorata* Warr., Nov. Zool., xii, 345 (Dominica).

1906. *fratercula* Warr., *Proc. U.S. Mus.*, xxx, 499 (Cuba) (*argentistriata* subsp. vel syn.).

1906. *sororcula* Warr., *t.c.*, p. 500 (Cuba).

1907. *flavilimes* Warr., Nov. Zool., xiv, 260 (Carabaya).

1910. *incolorata* Prout, *Tr. Ent. Soc. Lond.*, 1910, p. 286 (" *paradoxata* subsp.") (Buenos Aires).

By an extraordinary series of mischances, the most widely distributed (and by far the commonest) species has not yet received a legitimate name, with the exception of *incolorata* Prout, given to its southern race as recently as 1910. It has been consistently labelled *privignaria* by Schaus and Warren, as well as by Druce in the " Biologia " collection, but apart from disagreements with Guenée's description (colour and shape), it does not seem to occur in the West Indies proper, i.e. apart from Trinidad ; on geographical and other grounds I considered myself safer in identifying it with *paradoxata* Guen., but the type of the latter has not justified my determination. I therefore see no alternative to the imposition of a new name, though I shall be only too glad if it can be demonstrated that Stoll's figure (t. xxxi, 4) is a representation (almost incredibly bad) of the species under discussion, which is well known from Surinam, or that this does occur on Martinique and that Guenée's indication of the forewing shape (" un peu coudées "

[1] Since this was written I have, through the kindness of Prof. E. B. Poulton, been able to examine the Oxford Museum *Phrygionis* and find 2 ♀♀, one without label, the other " So. Domingo," agreeing perfectly together and only differing from Guénée's type in their rather larger size ; my suspicion is thus thoroughly confirmed.

between R^3 and M^1) means next to nothing—or " supérieures " here a misprint for " inférieures "—so that one of the derelict names may be rehabilitated.

Phrygionis incolorata restituta subsp. n.

" *Phrygionis privignaria* Guen." Druce, *Biol. Centr. Amer., Lep. Het.*, ii. 92 (1892) (nec Guen.).
" *Phrygionis paradoxata* Guen." Prout, *Tr. Ent. Soc. Lond.* 1910, p. 286 (1910) (nec Guen.).

Differs from *i. incolorata* Prout (*l.c.*, p. 287), as indicated, by the presence on the hindwing of a narrow orange band (or thick line) outside the silvery line which bounds the postmedian band distally, also a more or less developed terminal line of the same orange tint. From all the South American *Phrygionis* it is readily distinguished by the purer grey colour (a little darker and less yellow-tinged than in *argentata*), the complete series of metallic spots at proximal edge of hindwing band, and the fine yellow rays which run inward from the said band along the veins. Hindwing at least as weakly angled as in *politulata* Guen.

Mexico to Rio Janeiro, very generally distributed except at high altitudes. Type ♂ from San Esteban, Venezuela, in coll. Tring Mus.

The following species and forms likewise require naming.

Phrygionis moeschleri sp. n.

" *Eulepidotus paradoxata* Guen.," Möschl., *Abh. Senck. Ges.*, xvi, 245 (1890) (nec Guen.).

Paler than *cruorata* Warr. (1905), of which it may probably be a race (about the colour of *argentata*); forewing otherwise very similar to that of *cruorata*, inner band a little more sinuous, outer band perhaps broader; hindwing with the outer part of the band somewhat broadened, the white line which bounds it distally rather clear, the terminal orange markings a little less reddish (more approaching the colour of those of *argentata*), more interrupted at SC^2 and at R^1.

Porto Rico, the type ♀ in coll. Brit. Mus., ex coll. Möschler.

Phrygionis gemmea sp. n.

♂♀, 31–40 mm. Nearly always smaller than *argentata* (Drury, 1773), hindwing with the angle at R^3 appreciably blunter. Ground-colour purer grey without the suspicion of yellowish which is discernible in *argentata*.——*Forewing* with the yellow bands a little paler, the antemedian more sinuous, approaching the form of that of *argentistriata* Streck., the postmedian a little broader, with the metallic costal markings of its centre generally less developed but with its white distal line nacreous (in *argentata* dead white).——*Hindwing* with the band similarly broadened, the fine contained posterior line slighter than in *argentata*, the metallic spots close to midtermen accompanied by less of the red shading, in particular without any connecting them distally, the spots, indeed, being set on a more definite projection of the pale colour of the band than in *argentata*.

Jamaica, not rare, the type ♂ in Mus. Tring.

The determination of Drury's very crude figure would be a matter of some difficulty but that it represents a ♀ of extreme size (" almost $1\frac{3}{4}$ inch ") ; the basal yellow band of the forewing is omitted, as also the red accompaniment of the spots of the hindwing, the wing-shape is quite inaccurate and the postmedian band very inexact ; but the antemedian and the strong costal mark in middle of postmedian favour the larger species. The type must, I suspect, have been in bad condition.

Phrygionis dominica sp. n.

♀, 40 mm. Near *argentata* Drury and *gemmea* Prout (*supra*), wings perhaps a trifle narrower, the hindwing with termen decidedly more gibbous than in the ♀ of either (some ♂♂ of *gemmea* approach this shape), but not actually pointed at R^3 as in *argentata*.——*Forewing* perhaps slightly less pale than in either; antemedian as in *argentata*; postmedian even broader than in *gemmea*, or at least broader in its anterior half, its white distal element not appreciably nacreous.——*Hindwing* with the dividing line of the yellow band very well developed, the orange band which succeeds the outer silvery line well developed, in anterior half not subinterrupted (as in *argentata*) nor subconfluent with the orange terminal line (as in *gemmea*), the posterior half much weaker, chiefly *proximal* to the silvery line; metallic spots close to termen both accompanied by red shading proximally, the posterior one less small than in *gemmea*, their red terminal connection (compare *argentata*) wanting.

Dominica, 1 ♀ in coll. Brit. Mus.

This should be very near the lost *privignaria* of Guenée, especially if the forewing of that was malformed or badly described; but the white of the forewing is not nacreous and both the spots of the hindwing are surmounted with red; moreover, I should not call the ground-colour "café-au-lait."

Phrygionis sestertiana sp. n.

♂♀, 40–41 mm. Closely similar to *politulata* Guen., which it evidently represents in British Honduras. Ground-colour a little less grey, more inclining to light pinkish cinnamon or pinkish buff, the transverse metallic markings more bronzy, bands of forewing slightly more oblique, the distal white element of the postmedian narrowed; in addition to the two characteristic longitudinal streaks (before and behind SC^5 of the forewing) there is a much shorter one between R^1 and R^2 near (but not reaching) the termen.

British Honduras, a pair in Mus. Tring, the type ♂ from Orange Walk, 1917.

Phrygionis stenotaenia sp. n.

♂, 41 mm.; ♀, 42–44 mm. Rather larger than *politulata* Guen., darker, a little warmer, the orange tint of the apical region of the forewing consequently rather less differentiated; hindwing more angled (tailed), about as in *appropriata* Walk.; longitudinal silvery marks of forewing as in *politulata*; bands extremely slender, almost as warmly coloured as in *appropriata*, the postmedian at least as oblique as in *sestertiana*, without the distal white element, that of the hindwing considerably nearer the termen than in *appropriata*; metallic markings between subbasal and antemedian of forewing close to costa perhaps less developed than in *politulata*; tail-spot of hindwing considerably less small; hindwing beneath with the terminal dark band as strong as in *appropriata*, but narrower.

Carabaya, S.E. Peru: La Oroya, 3,100 feet, September 1904, type ♂, August 1904, allotype ♀, both in Mus. Tring (G. Ockenden). Bolivia: Santa Cruz, 1926 (J. Steinbach), a ♀ in the same collection.

As **Ph. s. isthmia** subsp. n. I describe a provisional race from Panama, the ♂ expanding 42–43 mm., perhaps slightly narrower-winged, the postmedian on the forewing slightly less oblique, on the hindwing less approximated to termen, the tail-spot of the hindwing with same red edging proximally. The type ♂, in addition, is a little darker (duller) than *s. stenotaenia*, both above and beneath,

and neither example shows any metallic scaling proximally to the postmedian of the hindwing in front of R^3, as is the case in both the Carabaya *stenotaenia*, though not in the Bolivian.

Panama: Volcan de Chiriqui, 2,000–3,000 feet (type); Caldera, a more *stenotaenia*-coloured ♂, with the postmedian of the forewing less extremely narrowed than in any other known example of the collective species; both collected by Champion and left undescribed by Druce.

As **Ph. s. miura** subsp. n. I describe another provisional form (? sp. div.). Size and shape of forewing about as in *s. stenotaenia*, hindwing slightly less tailed than in the other forms, merely with a moderately sharp angle (approaching a right angle) at R^3. Ground-colour a little darkened, but warmer (more cinnamon-tinged) than in the type of *s. isthmia*, postmedian line about as in *s. isthmia*, tail-spot of hindwing smaller—sometimes almost as small as in *politulata* Guen. Underside rather dusky, with the darker border of the hindwing rather broad but vague.

Guatemala: Tamahu, Vera Paz (Champion), type ♀, discovered in Druce's series of *appropriata* Walk. Honduras: La Cambre (J. Lienhart), a rather worn ♂ in the Joicey collection.

Phrygionis modesta marta subsp. n.

♂♀, 40–48 mm. Generally larger than *m. modesta* Warr., somewhat paler and less fawn-coloured, the "luteous" marginal area of the hindwing in consequence better contrasted, metallic markings on the whole a little stronger, especially the "tail-spot" of the hindwing.

Colombia: Onaca, Santa Marta (C. Engelke), the type series of 7 ♂♂, 6 ♀♀ in coll. Tring Mus.; Sierra del Libane, Minca and Don Amo (Magdalena) (H. H. Smith), in coll. Joicey, a good series.

Phrygionis amblopa sp. n.

♂, 39–49 mm.; ♀, 47–49 mm. Near *appropriata* Walk. (1861), particularly in the shape of the hindwing and its rather large tail-spot. Much duller, especially the hindwing—forewing with less fawn suffusion, hindwing without any orange suffusion distally; postmedian band nearly always very narrow, sometimes almost obsolete, its colouring pale, only becoming orange-tinted on posterior half of hindwing; antemedian of forewing just appreciably curved or bent at SM^2, postmedian more oblique than in *appropriata*, thus diverging more from antemedian, that of the hindwing slightly more distally placed than in the ally; fringes almost white; the anterior silvery half-line close to termen of hindwing slenderer and less white than in *appropriata*, tail-spot with the non-metallic part red or red-brown, not black. Underside paler but equally dull and devoid of any orange suffusion.

Santa Catharina, S. Brazil: Jaragua do Sul, 12 ♂♂, 3 ♀♀ (including the type ♂) and Neu Bremen, Rio Laeiss, 1 ♂, all in Mus. Tring, received from F. Hoffmann.

A series in various collections from Castro, Parana, and one or two from São Paulo (E. D. Jones), oftener small and with slightly more of the ground-tint of *appropriata*, together with a less narrow postmedian band, must be provisionally referred here, probably a race, but the two smallest Santa Catharina ♂♂ share

with them these characters, while the only small Santa Catharina ♀ is of the extreme *amblopa* form and the largest ♂ from that locality is an extremely handsome broad-banded aberration, while the series furnishes some transitions. I therefore treat the variations as individual, although the possibility is not excluded, in view of the enormous richness of the Neotropical Geometrid fauna, that we may be dealing with two distinct species.

The range of the forms, so far as I have yet recorded, is as follows :

1. *Ph. i. restituta* Prout. Mexico to Rio Janeiro.
   Ph. i. incolorata Prout. Sao Paulo to Paraguay and Buenos Aires.
2. *Ph. moeschleri* Prout. Porto Rico.
3. *Ph. cruorata* Warr. Dominica.
4. *Ph. argentata* Drury (= *decorata* Fb. = ? ? *cultaria* Hb. [*politata* Stoll, err. det.]). Jamaica.
5. *Ph. gemmea* Prout. Jamaica.
6. *Ph. privignaria* Guen. Martinique.
7. *Ph. dominica* Prout. Dominica.
8. *Ph. sororcula* Warr. (= ? *cultaria* Hb.-Gey. [nec Hb.]). Cuba.
9. *Ph. paradoxata* Guen. Haiti.
10. *Ph. a. argentistriata* Streck. Florida, Bahamas.
    Ph. a. fratercula Warr. (? syn.). Cuba.
11. *Ph. sestertiana* Prout. British Honduras.
12. *Ph. s. stenotaenia* Prout. S.E. Peru, Bolivia.
    Ph. s. isthmia Prout. Panama.
    Ph. s. miura Prout (? sp.). Guatemala, Honduras.
13. *Ph. politulata* Guen. Trinidad, Guianas, Pernambuco, Bahia, E. Bolivia.
14. *Ph. m. modesta* Warr. S.E. Brazil, Paraguay, Entre Rios.
    Ph. m. marta Prout. Colombia.
15. *Ph. amblopa* Prout. S. and S.E. Brazil.
16. *Ph. appropriata* Walk. Mexico to W. Ecuador.
    form. *metaxantha* Walk. Bogota, N.W. Venezuela, Peru, Bolivia, ? Costa Rica (trans.).
17. *Ph. flavilimes* Warr. Peru.
18. *Ph. sumptuosaria* Möschl. Jamaica.

The following key will give a clue to my interpretation of the forms ; a very few of the puzzling "*amblopa*" of S.E. Brazil develop traces of the silvery longitudinal streaks of the *politulata* group, but otherwise I have found the key workable for all the material examined.

1. Forewing with termen elbowed in middle . .	*privignaria* Guen.[1]
Forewing with termen not elbowed in middle . .	2
2. Metallic longitudinal streaks in cellules 6 and 7 of forewing	3
No metallic longitudinal streaks in cellules 6 and 7 of forewing	5
3. Postmedian band narrow, without white distally ; hindwing tailed	*stenotaenia* Prout.
Postmedian band broader, on forewing white distally ; hindwing not tailed	4

[1] Teste Guenée ; unknown to me.

4. A short additional metallic streak in cellule 5 of forewing . . . . . *sestertiana* Prout.
   No short additional metallic streak in cellule 5 of forewing . . . . . *politulata* Guen.
5. Hindwing rarely tailed, its band pale yellow or obsolescent, tail-spot with non-metallic part reddish or very small 6
   Hindwing tailed, its band predominantly bright orange, tail-spot with the non-metallic part black . 16
6. Postmedian of forewing with metallic edging distally (5 metallic lines) . . . . . *sumptuosaria* Möschl.
   Postmedian of forewing without metallic edging distally (at most 4 metallic lines) . . . 7
7. Band of hindwing emitting yellow vein-streaks proximally 8
   Band of hindwing not emitting yellow vein-streaks proximally 15
8. Antemedian band strongly incurved at fold . . 9
   Antemedian band not or scarcely incurved at fold . 11
9. Darkish cinnamon-drab, silver line of hindwing bordered distally with orange . . . . . *argentistriata* Streck.[1]
   Not cinnamon-drab, silver lines of hindwing not thus bordered 10
10. Band of hindwing yellow as far as the silvery outer line . . . . . *gemmea* Prout.
    Band of hindwing only narrowly yellow (adjoining the metallic proximal spots) . . . . *moeschleri* Prout.[2]
11. Hindwing with midterminal spots red, distally confluent (V-shaped or L-shaped) . . . . *paradoxata* Guen. and (subsp. ?) *sororcula* Warr.
    Hindwing with midterminal spots not so . . 12
12. Band of hindwing yellow as far as the nacreous outer line 13
    Band of hindwing only narrowly yellow (adjoining the metallic proximal spots) 14
13. Hindwing anteriorly with orange terminal blotches . *argentata* Guen.
    Hindwing anteriorly with orange subterminal broad band and terminal lines . . . . . *dominica* Prout.
    Hindwing anteriorly without orange, or only with subterminal and terminal lines . . . . *incolorata* Prout. and subsp. *restituta* Prout.
14. Darker, at termen of hindwing with the anterior orange band-like . . . . . *cruorata* Warr.
    Light, at termen of hindwing with the anterior orange macular . . . . . *moeschleri* Prout.[2]

[1] If *fratercula* Warr. is separable racially, I have not sufficient material before me to give absolutely constant differences; perhaps an intensification of the dark markings is significant, at least as regards the fine outlines of the yellow vein-streaks of the hindwing and the hindmarginal spot which bounds the antemedian distally on the forewing.

[2] This species is keyed twice, on account of the equivocal form of the antemedian band.

15. Dark grey, hindwing tailed, tail-spot large, predominantly reddish . . . . . *amblopa* Prout.
    Less dark, hindwing bluntly bent, tail-spot small, wholly metallic . . . . . *modesta* Warr.
16. Yellow of fringe encroaching on wings, proximally edged with blackish; metallic spots of hindwing continuing forward to SC^2 . . . . . *flavilimes* Warr.
    Yellow of fringe rarely encroaching on wings, proximally not edged with blackish; metallic spots of hindwing ceasing anteriorly at radial fold . . 17
17. Orange band of hindwing suffusing proximally, also tinging the underside . . . . . (f.) *metaxantha* Walk.
    Orange band of hindwing not or scarcely suffusing proximally and not tinging the underside . . (f.) *appropriata* Walk.

ON THE DISTRIBUTION AND SYNONYMY OF THE *ADELPHA* OF PARÁ

By ARTHUR HALL, F.E.S.

(With Plate I, figs. 19 and 20)

THE account of *Adelpha* in Seitz's work, although the fullest yet published, contains a number of errors, so that a revision of the whole genus is desirable ; but it is only possible here to deal with the species found near Pará.

Although the Rev. A. Miles Moss modestly claims in the article here following to have taken or bred only twelve species, he has in fact obtained thirteen, two of which appear to be new. Another species not yet found by Mr. Moss is in the British Museum from Pará, bringing the number up to fourteen :

(1) *A. mesentina* Cramer (1779).—Characteristic of Guiana and the Amazon, ranging to the lower slopes of the Andes and to Colombia. As a perfect insect it has not much resemblance to any other species, so that the similarity of its early stages to those of *A. delphicola* is surprising.

(2) *A. cocala* Cramer (1782).—Occurs in various forms throughout the whole of Tropical America. The Pará race is typical.

(3) **A. pseudococala** sp. nov.

♂♀. Nearest to *A. cocala* Cramer, but larger ; proximal edge of band of forewing more deeply incised at the junction of veins 3 and 4, this character being still more obvious on the underside ; the inner of the two postdiscal series of bluish white spots beneath more sharply defined, as are also the discal spots of forewing. Types from Pará in the collection of the Rev. A. Miles Moss ; also taken by me at Mabaruma, N.W. British Guiana, and a ♀ in the Tring Museum from Iquitos.

We have hitherto taken this to be a slightly aberrant form of *A. cocala*, but the discovery of the early stages by Mr. Moss seems to prove its distinctness.

(4) *A. cytherea* Linné (1758).—A very common and widely spread species, generally in swampy places at low elevations.

(5) *A. thesprotia* Felder (1867).—This variable species, ranging from Colombia to Guiana and S. Brazil, has been strangely misidentified by Fruhstorfer in Seitz ; he places the name under *A. melona*, with which it has nothing whatever to do, and describes the true *thesprotia* as *A. euboea*, with which it has also nothing to do. The type of *thesprotia* in the Tring Museum is a female agreeing well with those bred by Mr. Moss and closely approaching the form figured by Seitz as *fabricia*.

(6) *A. delphicola* Fruhstorfer (1910).—It is not easy to separate this species from *A. thesprotia*, so that the wide difference in its early stages as discovered by Mr. Moss is of particular interest.

(7) *A. jordani* Fruhstorfer (1915).—Hitherto only known from Peru and Bolivia. The Pará form is almost certainly a subspecies, but as we have only seen females from that locality and only males from the Upper Amazon, we are unable at present to separate it.

(8) *A. phliassa* Godart (1819).—This is another characteristically Amazonian

species, but ranging to Trinidad and S. Brazil ; to it belongs *euboea* Felder (1867) as individual form or synonym.

(9) *A. iphicla* Linné (1758).—The most widely distributed and commonest species of the genus, but apparently not so abundant at Pará as in most localities.

(10) *A. melona* Hewitson (1847).—Almost confined to Guiana and the basin of the Amazon and never very abundant. With the possible exception of *meridionalis* we are unable to recognise the forms separated by Fruhstorfer.

(11) *A. serpa* Boisduval (1836).—This highly variable species extends from Mexico to Brazil in many forms. Pará specimens do not seem quite to agree with any of the named forms, but come nearest to the typical race from Rio de Janeiro.

(12) *A. paraëna* Bates (1865).—Commonest in Guiana and on the Lower Amazon, but also found as a rarity in Peru. This species differs from *A. serpa* chiefly in wanting the white spot in cellule 3 of the forewing. It is nearly always found in company with *A. serpa* and was treated by Fruhstorfer as a form of it, so that Mr. Moss has again done good service in proving the distinctness of its early stages.

(13) **A. mossi** sp. nov. (Pl. I, fig. 20).

♀. Nearest to *A. velia* Felder (1867) (Pl. I, fig. 19), but larger. On the forewing the fulvous band is of the same shape as in *velia*, but a little broader and much longer, extending to the middle of cellule 1b, the white band reaching only to the middle of that interspace and shading more gradually into the fulvous area. On hindwing the white band is about as broad as in *velia*, but has its proximal edge slightly excavated in cellule 6 (individual character ?), and there is no yellow spot at anal angle.——Underside : median white band of forewing broader than in *velia*, especially anteriorly, the spots in 5 and 6 extending to the bases of those interspaces, whilst in 4 there is only a linear blue-grey spot at the base ; white discal spots 2–4 distinctly separated ; admarginal linear spots of hindwing narrower, but sharper, the submarginal spots less well defined, the brown spots proximal to them more oval.

Expanse : 104 mm. Type : 1 ♀ taken at Pará by A. Miles Moss.

(14) *A. malea makkeda* Hewitson (1871).—This species has not been met with by Mr. Moss, but the type is said to have come from Pará. *A. malea* Felder (1867) is a very rare and little-known species, the typical form of which was rather badly figured by Felder and still worse by Seitz, the latter's figure being named *leuceria* on the plate. The species belongs, at least in outward appearance, to the group of *A. erotia* Hew. and its allies, but the white band of the hindwing is bordered distally by a yellow band of about equal width ; in the type specimen the white band is also clouded with yellowish, a character which has been exaggerated in the figures of Felder and of Seitz so as to give the appearance of a wholly yellow band, but in a specimen taken by me at San Esteban, Venezuela, the two colours are sharply separated. In a further form, *A. malea heraclea* Felder, the type specimen has on the hindwing a white band with only a few yellow scales on its distal edge, and there occur also specimens without any yellow scaling at all, a fact which probably misled Fruhstorfer when he placed it in a group entirely different from *malea*, but the forewing and underside of both wings are quite similar.

SOME GENERALIZATIONS ON *ADELPHA*, A NEOTROPICAL GENUS OF NYMPHALID BUTTERFLIES OF THE GROUP *LIMENITIDI*.

BY THE REV. A. MILES MOSS, M.A., F.R.E.S., F.Z.S.

(With Plates I and II.)

AS with the three recognized groups of the genus *Papilio* in South America, or the more compact, but very extensive, subfamily of the *Heliconiinae*, so does the genus of *Adelpha* run into a very large number of species, which, as butterflies, bear the most confusing resemblance to one another in many instances. So much is this the case with two at least in Pará, that they will almost assuredly be passed over by the collector who has not studied their early stages, or be found in his collection confounded under the name of one species. Nothing short of a long series of bred specimens, of e.g. *Adelpha thesprotia* and *delphicola*, would enable one to point to some small features of difference, sufficiently constant to be pronounced specific. With caught or worn specimens the difficulty of determination is of course increased. And yet these two butterflies, so extraordinarily alike, to take but one instance out of many others that might be adduced, show the most unmistakable differences from one another throughout their early stages. Their food-plants are very distinct, the colour and markings of their larvae, and, still more important, the whole character, length and disposition of their spines, are entirely different, while finally their resting posture in the last instar, and the strange-shaped pupae, are found to be in the greatest possible contrast.

This is truly remarkable, for in the genus *Papilio*, for example, the exact reverse holds good. There is no confusion possible between the butterflies of *P. anchises* and *P. echemon*, but their larvae are extremely similar; both feed on identical species of *Aristolochia*, and I defy anyone, who may chance upon this type of pupa in nature, to predict with any degree of certainty whether, on emergence, it will turn out to be *P. aeneas*, *anchises*, *echemon* or *neophilus*. I merely name four out of a much larger number of allied species which are similarly identified in their early stages, but whose specific distinction as butterflies cannot for one moment be questioned.

With 12 species [1] of *Adelpha*, upon which I wish to record my recent observations, only two pairs of grown larvae (one on a tree, the other on a creeper, and very distinct *as pairs*) might possibly be confused at that stage, and only one of those pairs, viz. *delphicola* and *mesentina*, as pupae, for I have done so myself on the one and only occasion when the emergence of *mesentina* caused me surprise and pleasure mingled with regret that, when possessed of several larvae and pupae from *Cecropia*, I had noticed no differences, supposing them all to be *delphicola*. It so happens that these two are very distinct as butterflies. For the rest, there is no excuse for mixing them up, because they are utterly unlike both as larvae and pupae and proceed from altogether dissimilar food-plants.

My special object is to direct attention to the kind and extent of these curious divergencies of form and habit.

[1] Cf. p. 10.

Though I had lived some thirteen years in Pará, and had caught varied specimens of *Adelpha* from time to time, I had not studied the genus with that particular degree of interest and enthusiasm bestowed upon certain other groups of butterflies and moths. I knew that we had several distinct species, but it was only in the early part of 1925 when I got my copy of Seitz bound up, examined the beautiful figures of more than 100 forms given on 5 of its plates, and read Fruhstorfer's 22-page article, that I realized there were so many species, and that very little beyond the mere record of the locality of the butterfly was known about them. The author enumerates some 60 species together with something like 267 local or geographic races, at present considered to be subspecies only. I gather, moreover, that the whole are limited to the tropical region of the American continent and its adjacent islands, 31 species having been obtained in Central America, while but a meagre 13 of the 60 are recorded for the Amazon.

Here surely was scope for some research, especially as little or nothing was known of early stages and food-plants beyond the general information contained in the following passage, page 511 of the text : " The larvae of *Adelpha*, as far as they have become known, generally resemble the larvae of *Limenitis* ; some have branched spines, in others they are altered into short hairy caruncular cones. The head is set with short spines. The pupae are, according to Dr. W. Müller, of a peculiar shape, with 2 horns on the head and broad wing-edges, mostly of brown colour with more or less metallic lustre." All this I have found to be perfectly correct, so far as it goes, and it applies admirably to three species, namely *cytherea*, *pseudococala* and *cocala*, but it is far too brief and general to be of much use, or to be considered a worthy scientific account of a group of larvae and pupae whose salient feature is its great diversity rather than conformity to any one standard plan or pattern.

I determined therefore that no further time should be lost in trying to estimate the strength of Pará's contribution in *Adelpha* towards the 13 species recorded for the entire Amazon ; and in this I was so fortunate that in less than six months I had found 11 species, and bred 10 of them from the larvae. With most of them this has several times since been repeated, occasionally even from the egg, when a female butterfly has been observed in the act of ovipositing.

This experience has led me to the conclusion, already emphasized, that these apparently similar butterflies are in reality far more distinct than has been supposed, and moreover that if I can find 11 kinds straight away in the immediate vicinity of Pará, it is highly probable that there are more than 13 species throughout the length and breadth of the Amazon.

Of my 12 species, *cytherea* is undoubtedly the commonest hereabouts, as elsewhere, but I cannot say that any of the others are really abundant, and some, in association with their restricted food-plants, are distinctly scarce and difficult to obtain.

On the other hand, judging by the number of months in the year in which I have now by diligent searching been able to find a few recently hatched larvae (the egg-stage only occupying some six days), I conclude that there must, at least in some cases, be a fairly constant succession of broods.

In two only of the early stages is there a great outward similarity between the species of *Adelpha*, viz. the straw- or greenish-yellow honeycomb-patterned and hairy egg, and the small, rough, tapering, dark-brown larvae in their first and second instars. These invariably cling by invisible silken threads to the

denuded end of the midrib of a leaf, and are marvellously obscured by resemblance to their surroundings of brown debris, consisting of their excrement and tiny scraps of leaf, cut and retained by a strand of silk.

This habit, in which both colour and form combine to afford obscurity and protection, is of course well known with many species, but I may mention in passing that it is markedly reproduced by the tiny larvae of *Siderone*, *Zaretes*, *Hypna* and *Anaea*, and even by the young of *Prepona* species, often providing a ready clue to their whereabouts.

I cannot doubt, however, that if one knew exactly what to look for, even then these young larvae of *Adelpha* would afford sufficient points of specific difference from one another under the lens. Though still brown, but of a lighter tone, in the third instar, I think I am correct in saying that some distinction, in all the cases that have come under my observation, is apparent to the naked eye.

My next observation is the unhappy one that, notwithstanding all this wondrously elaborate system of protective resemblance to surrounding objects, predatory attack and parasitism are by no means thwarted, but seem ever to prevail in Pará on the most extensive and distressing scale. So far as I have observed, it is only in the earliest stages of the larvae that these two dangers exist. Of course a sudden gust may occasionally dislodge these tiny creatures, or heavy rain wash them from their perches ; but from the very numerous instances where it is apparent, from the extent of its feeding, that all has gone well with the little caterpillar for a few days, and yet no caterpillar is now to be found, I am convinced that it has been carried off bodily, possibly by some small Dendrocolaptid bird, but more probably, allowing for its position at the tip of a leaf, by some marauding ant or wasp, both superabundantly in evidence here at all times. It is just worthy of note that, instead of adapting itself to its environment, it very skilfully constructs an environment adapted to itself, and even then, alas, often fails.

All my experience supports the view that it is only in the very earliest days of their larval history that they are in grave danger of being " stung " by tiny Hymenoptera, and possibly up to the third instar by Diptera, for it is during these stages that I have taken the majority of my larvae. They have then always appeared sound and well, but subsequent developments have in only too many instances proved that the damage had already been done. When found later, they have generally proved immune, and have certainly been fortunate enough to pass their infancy unobserved by the small wasp, whose destructive larva always shows up just prior to the second moult of the *Adelpha*. Here, generally at the extreme tip of the midrib of its leaf, it rests motionless, and, after failing in its appetite for a few days, there is found in its place a little oval cocoon firmly attached with more or less of its host's skin adhering. This cocoon in the case of *cytherea* is ochreous and very minute ; from *thesprotia*, *cocala* and *jordani* it is black with a couple of encircling white belts (very similar to one produced from the larva of *Cidaria reticulata* in England), and, by comparison with the former, so big that the maggot must have entirely filled the little caterpillar's body. It is surely a marvel how so minute and slender a creature as the newly hatched larva of *Adelpha* can thus have been pierced by the ovipositor of the parasite, or even found by it at all.

In the case of *thesprotia*, for one lucky find of a larva that has escaped, I suppose that on the average I discover, or produce later, a dozen parasitic cocoons,

noting another twenty places where the little larva has very obviously been at work on a leaf (sometimes three or four on a single plant), but has entirely vanished.

From the perfectly formed pupa of *thesprotia*, when reared under protection from quite young larvae, I have on at least five occasions bred a single Dipteron about the size of the common house fly, the maggot appearing several days after the pupation of its host, and sliding down to earth from the perforated or burst shell on a fine string of slime. It is again obvious that the damage was done in early days, but also that the dipterous larva has taken rather longer to mature, while its internal feeding has not in any way till now hindered the delicate performance of ecdysis on the part of its doomed host. *A. delphicola* is likewise troubled, and doubtless every single species of the genus, for I have frequently had just the same experience with other butterfly genera like *Danais*, *Heliconius*, *Caligo*, *Opsiphanes*, *Prepona*, etc.

Returning, however, to the subject of relationship, I have a few generalizations to make, some of which are sufficiently important to claim the close attention of systematists, who, by a careful examination of certain hitherto unsuspected points of likeness or dissimilarity between the species in their early stages, may perhaps be led to modify the existing order and grouping of the butterflies of this difficult genus. It is just possible that a few unexpectedly close relationships may thus be established, while others at present confused, or regarded as near of kin, may be found to be more distantly related than was supposed.

BRIEF DESCRIPTIVE NOTES OF EARLY STAGES.

1. **A. cytherea** (Pl. I, fig. 2 ; Pl. II, fig. 1).—When young dark brown, on midrib among brown debris at tip of fresh leaf. With growth on upper side of leaf, contorted with both ends elevated. Now in two shades of brown, when on the stem or near flower-head easily mistaken for a part of the plant, and so passed by. The commonest species.

2. **A. pseudococala** (Pl. I, fig. 1 ; Pl. II, fig. 2).—Identical in form, attitude and position with the foregoing ; a degree larger, and greener at both extremities. Common.

3. **A. cocala** (Pl. I, figs. 3, 4, 5 ; Pl. II, fig. 3).—Though more erratic and seasonal in appearance, the above holds good as a general description of the larva in regard to its form, contorted attitude and position on its food-plant. When young and dark brown apparently identical ; with growth rather more ornate, greener, spines thicker, more curved and mossy, reddish in centre with a touch of white and pink below in a series of oblique lateral stripes. This and the two former species reproduce *Limenitis sibylla* on honeysuckle in many details to a remarkable degree. Larva sometimes on the outermost leaves of a branch above one's head, more often, from 3 to 6 in number, on the lowest leaves near the ground of a small seedling of *Emmotum*.

4. **A. thesprotia** (Pl. I, fig. 13 ; Pl. II, fig. 4).—Young larva dark brown, as with all other species noted, on the bared midrib of leaf among its own debris and suspended scraps. Generally on small plants near the ground in heavy shade. Of all species most often "stung" by hymenopterous parasite. In third instar median dorsal area light brown ; in fourth still brown, but more heavily spined, and sits erect. In final instar entirely grey, but with very numerous, thick-set and short spines. It now never elevates its extremities,

but lies flat on the upper surface of a leaf with its head segments turned completely round, like *Acronycta megacephala* (the Poplar Grey) of Europe.

5. **A. delphicola** (Pl. I, fig. 10 ; Pl. II, fig. 5).—In early life exactly like the foregoing in appearance and habits, but with this species often out of reach on the outermost leaves of the lower branches of some *Cecropia* or *Bombax* above one's head ; sometimes on saplings only a few feet from earth. Very often robbed by predatory foe. With growth sits on upper surface of leaf with extremities much elevated, a combination of light and dark brown with exceptionally long thin spines, branched out into fine spikes at the tip, and recumbent when at rest. Sometimes pupates among its own leaves.

6. **A. mesentina** (Pl. I, figs. 11 and 12 ; Pl. II, fig. 6).—So far found only on a small tree of *Pourouma* (*Imbaüba rana* or *branca*), and so similar to the preceding species in larva and pupa that no special observations were made. This is most remarkable. For, while no one could possibly confuse the two butterflies, the features which they share in common as larvae subsisting on the same food-plant, and developing a highly specialized pupa-form with an exaggerated dorsal cowl, are surely significant of a closer relationship than is accorded to them in Seitz, where Fruhstorfer separates them by 25 intervening species, and even places them in different groups !

7. **A. melona** (Pl. I, figs. 6, 7 ; Pl. II, fig. 7).—Exactly like the rest in early days in appearance and habits ; the larva generally within reach, and readily obtained by searching the *Malanea* creepers on tree-trunks. With growth the larva admirably imitates the green-grey rootlets of its plant, and when mature, with its thick green spines bunched together in an elevated posture, looks like nothing but a fragment of detached moss on the upper surface of a leaf.

8. **A. serpa** (Pl. I, figs. 15, 16 ; Pl. II, fig. 8).—As with others in early life, the young larva being found on bushes or the lower boughs of at least 3 distinct species of *Miconia* trees. Not rare, but seasonal in appearance. (Puzzle : Where is it all the rest of the time ?) Full-grown larva dark green, the prominent spines on segments 3, 4, 6, 11 and 12 strongly developed, curved and recumbent at rest. In this position it assumes the attitude of *A. thesprotia*, lying flat on the leaf, with the head segments turned, looking very oily, and resembling nothing so much as the fresh " dropping " of a bird. The spines on segment 6 are very bushy and dark green, the belt behind the bifurcated black-striped head, together with the anus and the other prominent spines being of an ochreous hue.

9. **A. iphicla** (Pl. I, fig. 18 ; Pl. II, fig. 10).—The larva found once, on *Ourouparia guianensis* ; very similar to that of *A. cytherea*, the two species evidently being closely related, as is also shown by the pupae. The butterfly has occasionally been taken at Pará, in my garden and even in the house, apparently attracted by the debris in the hen yard.

10. **A. phliassa** (Pl. I, fig. 14 ; Pl. II, fig. 9).—Throughout life very dark. When at rest the grown larva contorts by elevation of the extremities. In the final instar the colour is nearly black, besprinkled with a few fine white dots. A lateral oblique dash of pink and white marks the posterior segments. Spines strangely varied in character, but not very long or prominent. A common species, but seasonal in appearance.

11. **A. jordani** (Pl. I, figs. 8, 9 ; Pl. II, fig. 11).—When young dark brown like all the rest, and in similar positions, either on small bushes or on the lower

branches of trees growing on forest paths that are not too sun-scorched. Leaves eaten at the tip in the approved fashion of the genus have often been observed well above one's head. In such a position a female of this butterfly was observed depositing ova on July 3, 1926, on a tree in the Bosque, Pará. Too often have the little larvae been robbed by bird, wasp or ant, and so the species remains rare, and is the most difficult of all to obtain. With growth the larva assumes a uniform plain dull green colour like the leaf. Beyond the usual double dorsal series, it has no other spines or ornaments. Its spines are thick and short by comparison with other species, more uniform in character and length, all being orange to the base and crowned with black spikes. Though the butterfly of *A. jordani* shows many features of likeness to several other species, its pupa is remarkably different from all the rest, being white with tar-black spots and streaks, reminding one strongly of *Thyridia themisto*.

12. **A. paraëna** (Pl. I, fig. 17 ; Pl. II, fig. 8, borrowed).—The caterpillar is very different from that of *A. serpa*, being much brighter green and having none of the spines orange.

In Utinga, the region of Para's water supply, there are several broad and shaded avenues, well-stocked with the saplings of two Rubiaceous trees,—(1) Isertia longifolia, with groups of very long, smooth and opposite leaves of spatulate form and bunches of coralline red and white flowers.—(2) Remijia amazonica, with equally long but lanceolate and velvety leaves arranged in pairs or in groups of three, the whole plant being thick and pilose.

These twin species of RUBIACEAE serve as the native food-plants for two interesting caterpillars,—the yellow and black giant which forms *Oryba kadeni*, a fairly common but exceedingly handsome green Sphinx moth, and a frail species of Adelpha known as *paraëna*, which shows a marked preference for the saplings growing but a foot or two above the earth. As with other Adelpha species, the egg of *paraëna* is laid singly at the extreme tip of these long leaves, and the tiny, obscure, brown larva, on hatching in about a week's time, begins by eating away this tip on both sides, merely retaining an inch or so of dried midrib to sit on, spinning an invisible strand or two of silk, and most admirably resembling its little accumulated pile of brown debris. This, however, is about as far as the majority ever get, for the clever disguise fails before the eye of the marauding wasp, and the place knows them no more. Were it otherwise, this lovely butterfly would soon become common ; for in a recent afternoon's walk I must have noted at least fifty of these early attempts, yet not a single larva rewarded my search. In no instance could I detect leaves sufficiently eaten to indicate that the little larva had done more than reach its second instar. As with so many others in Parà, it is a constant wonder to me that enough survive to carry on the species ; and an added ounce of experience of this negative sort is but small consolation, I find, for the waste of precious hours.

When *paraëna* does manage to attain to full growth it is a handsome but only too conspicuous object in its spined apparel of green and black lying on the upper surface of these large leaves.

Though altogether distinct from the larva of *serpa*, the pupae of the two species are much alike, and, as no new design was made, figure 8 on Plate II must for the time allowed to do double duty.

13. **A. mossi** (Pl. I, fig. 20).—I have as yet failed to find the caterpillar of this species, which is evidently very rare.

The flight of *Adelpha* in general is elegant but uncertain, and difficult to follow. Planing from on high with an occasional flutter it is for a brief moment within reach, but is quickly lost to view, seldom, except when drawn by some bait, to be seen returning to the same spot, as do our *Vanessidae*. The egg-laying of the female is a distinctly pretty operation, for having alighted on the upper surface of the leaf of her selection she literally slides down on spread legs to the end, curves her abdomen beneath, speedily senses the exact tip, and thereon deposits a single egg. This, when one has the luck to observe the mother intent on business, is obviously *the* way to procure a perfect bred series of *Adelpha*; while the rearing of the larva, allowing some six days for its emergence from the egg, and another fortnight or three weeks for it to mature, is neither a difficult nor a tedious process, provided that a spray of its particular food-plant be kept fresh in water in a cool place and occasionally sprayed. This is most readily accomplished with all the Rubiaceous trees and creepers, but with *Cecropia*, *Bombax* and *Vitex* sleeving is preferable, as the leaves when cut so soon become dry, the larva wanders and is perhaps lost.

After the discoloration and reduction of size associated with maturity, the adult larva generally wanders, sometimes quite a long distance from its plant to another, and in captivity may be found suspended on a bare wall or from the ceiling. Pupation quickly takes place and, with but one day's warning, the butterfly emerges in another fortnight, generally from 8 to 9 a.m.

Seldom is the pupa found in nature, though I have occasionally taken *A. delphicola* suspended from its own leaves and *A. serpa* and *A. cytherea* on some adjacent growth.

In regard to the form of the caterpillar, it is important to note that I describe my larvae throughout as possessing 13 segments, regarding the head as segment 1. Though the spines or spiky projections vary greatly in the various species as to number, position, curve, length and general character, a few features are shared in common. They are as follows: the head is always furnished with a prominent array of frontal spikes; the longest and most curved spines are always in dorsal pairs on segments 3, 4, 6, 11 and 12, the pairs on 3 and 11 generally, but strange to say not in every case, being slightly in excess of those on 4 and 12, while the pair on 6 are almost invariably the thickest at the tip, the darkest in colour and the most curved in a backward direction. Pairs of short erect spines mark the dorsal area of 7, 8, 9 and 10, and of these 8 and 10 are generally very slightly taller than those on 7 and 9. A number of subordinate spines of varying length mark the lateral area both above and below the spiracular line, but these vary greatly in different species.

Behind the head, which is encircled with a double corona of frontal spikes and a few extra prominences, segment 2 has sometimes a pair of similar projections, segment 5 is always the weakest or least adorned, while finally the tip of the anal flap on 13 is generally armed with a couple of very short spines.

In regard to the pupae, I have made a series of careful line drawings on an enlarged scale to show more clearly those particular and specific features wherein they differ. These speak for themselves, but I cannot refrain from drawing special attention to two, which are really very remarkable in their differences, namely the cowl or dorsal hump on the first abdominal segment, and the so-called "ears" on the head, sketched dorsally to show their direction and curvature.

Though the majority are plain light or dark brown, *A. serpa* is a bespangled jewel of metallic lustre, *A. thesprotia* is splashed with gold, *A. melona* of a dull maroon hue, *A. phliassa* a pale silvery grey, while *A. jordani*, as already stated, differs widely in another direction by being white with tar-black spots and streaks.

One wonders what the remaining 50 or so species, at present undiscovered and undescribed, as I assume, can exhibit in a still wider range of variety.

NOTES ON THE FOOD-PLANTS OF CERTAIN SPECIES OF *ADELPHA* IN PARÁ.

RUBIACEAE. Sabicea aspera—*A. cytherea* and *pseudococala*.

A roadside creeper, twining on bushes, but also growing free. Generally in the sun. Common on most woodland paths away from river. Like honeysuckle (*Lonicera*) in growth. Stems red, wiry and rough to the touch. Mature leaves dull green, opposite and narrow, ribbed acutely and from 2 to 4 inches in length. Flowers white, insignificant and in small groups. Ripe fruit red, but not edible.

RUBIACEAE. Alibertia edulis (Puruí)—*A. phliassa*.

Bush or small tree, growing in the open in clayey soil near rivers. At Manáos and in many places up the Amazon grows in sand, but generally near water. Leaves opposite, deep glossy green, lanceolate and from 4 to 6 inches in length. Flowers white, 4-petalled, in small clusters. Fruit of an inch or more in diameter, round, hard, glossy green ; when ripe turns brown, becoming black and soft inside, and, though full of small seeds, is edible, resembling tamarind in flavour.

RUBIACEAE. Berteira guianensis—*A. phliassa*.

Bush or small tree, local in "matto da terra firme." Leaves opposite, soft, dull green, lanceolate, 4 to 6 inches long. Flowers small and white in pendent racemes, resembling *Aegiphila*. Fruit like currants, but from green to blue, and not edible.

RUBIACEAE. Malanea sp. 1 and 2—*A. melona* and *cocala*, once in captivity *A. delphicola*.

Two allied tree-trunk creepers of moderate growth, clinging like ivy with small rootlets, sometimes growing free ; (1) hairy throughout ; (2) smooth. Common on borders of woodland paths of the "terra firme," but not noticed near river. Leaves ovate and opposite ; (1) heavily ribbed, yellow-green, red stalks ; (2) smooth, hard, glossy, dark green. No flowers found.

Order, Genus and Species ? "False cacao"—*A. thesprotia*.

A twiner growing only in clayey soil in the heavy shade of *Theobroma* and other trees near Rio Guama. Begins life as a separate bush, with no appearance of being a climber ; later throws out long tendrils, and probably only flowers on crown of other trees at 40 or 50 feet elevation. Leaves smooth, deep green, oval, alternate and deceptively like those of cacao but smaller. When cut

generally keeps fresh in water for many days. Both plant and butterfly are common at Manés.

MORACEAE. Cecropia, various sp. (*Imbaüba*)—*A. delphicola* and probably *A. mesentina*.

Moderate trees, with light, ribbed and cellular trunks. Though absent from certain districts, perhaps the commonest and most widespread tree of the Amazon region, whole tracts of river mud or sand being covered by one or other species. Leaves various in size, colour and form, but mainly glaucous, whitish beneath, long-stalked, digitate as in the horse chestnut or semi-digitate as in the sycamore. Will not keep fresh in water.

MORACEAE. Pourouma sp. (*Imbaüba rana*)—*A. mesentina* and *delphicola*.

A moderately big tree of the "terra firme," with light stem, rough, crisp, glaucous and whitish leaves, easily taken for a species of *Cecropia*, but not so common, and with entirely different flowers and fruit, the latter occurring in small bunches of purple drupes, sweet and juicy, and when fermenting on the ground are very attractive to the Morphos and other butterflies. Form of leaf mainly ovate and heavily ribbed, but often digitate like *Cecropia* on the higher boughs.

BOMBACEAE. Bombax munguba—*A. delphicola*.

A big forest tree, with smooth greenish trunk. Common and widespread. Leaves digitate and smooth, olive green with red veins and stalks. Flowers large, pink and white ; fruit a big capsule yielding the wild silk cotton.

VERBENACEAE. Vitex triflora (Guabiraba)—*A. jordani*.

A small forest tree, with light bark, not very common or obvious near Pará. Leaves trifoliate, rather sparse, dark green and crinkled. Flowers violet and sweet-scented in small bunches, producing a small purple and edible drupe.

ICACINACEAE. Emmotum nitens ? (sp. of Marachimbé)—*A. cocala*.

A moderate forest tree, but not so common about Pará as the larger *E. fagifolium* (Marachimbé). Leaves elliptical, alternate, lighter green and more heavily and acutely ribbed than the former. No flowers observed. Fruit circular, but somewhat flattened, whitish green and very hard.

MELASTOMACEAE. Miconia minutiflora and allies (Canella de velho)—*A. serpa*.

A moderate forest tree, common in parts and generally near water. Trunk smooth and light, but much corrugated. Leaves ovate, opposite, smooth, dark green on upper surface, light earth-coloured beneath, circumferentially ribbed twice to lengthened apex, while subordinate fine veins connect these with midrib at wide angle. Flowers small, cream-white, in clusters, producing purple fruit. Some allied species are edible, but are hardly interesting.

In conclusion I would like to express my grateful thanks to Dr. Karl Jordan and Mr. A. Hall for the invaluable assistance which they have both rendered me in the careful, painstaking, and difficult work of the identification of species.

EXPLANATION OF PLATES I AND II.

Plate I.

Plate II.


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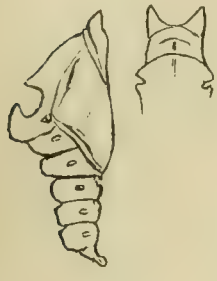

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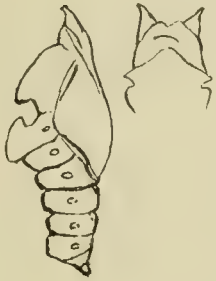

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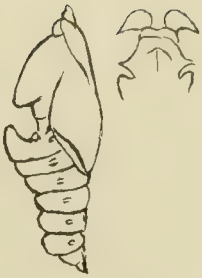

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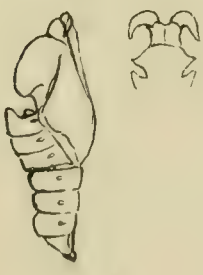

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NOTES ON THE GENUS *LYMANTRIA* HBN. (LYMANTRIIDAE), WITH DESCRIPTIONS OF NEW SPECIES.

By C. L. COLLENETTE.

(With Plate III.)

IN the genus *Lymantria* there exists considerable sexual dimorphism, which has led to a number of errors in the past in determination and description, and to the naming of species from one sex while specimens of the other sex remained unrecognized. In a recent paper on the Lymantriidae of Malaya (Nov. Zool. xxxviii, p. 49, 1932) I ventured to clear up several points of this nature, while the present paper is the result of an examination of all the remaining material in the genus contained in the British and Tring Museums. I have refrained from undertaking a general revision of the genus, as I hope to include this in a paper on the whole family at a later date, but have included descriptions of several new species and dealt with cases of synonymy.

The name under which the genus should be known presents some difficulty. Swinhoe, in his revision of the family (*A.M.N.H.* (9) x, p. 449), uses *Liparis* Ochs. (1810), and states that although this name was used in 1738 by Artidi for a genus of fishes, this date was prior to the starting date for nomenclature, 1758. However, Scopoli, in *Introd. Nat. Hist.* 1777, p. 453, cites and validates Artidi's description, and *Liparis* Scop. is now in current use in Ichthyology. *Liparis* Ochs. must be relegated as a homonym.

In Seitz's *Grossschm. d. Erde*, Schaus in vol. vi uses *Porthetria* Hübn., while Strand and Hering in vols. ii, x and xiv use *Lymantria* Hübn. These two names originate on page 160 in the *Verseichnisz*, *Porthetria* being mentioned first. Several species are cited under *Porthetria* without designation of type, including *P. dispar* L., while under *Lymantria* only two are given, *L. monacha* L. and *L. eremita* Hübn. *L. eremita* is now known to be a colour variation of *L. monacha*.

The first authors to use *Porthetria* appear to have been Humphreys and Westwood, in *Br. Moths and their Transf.*, i, p. 85, 1843, but although *P. dispar* L. is the only species mentioned under the genus, it is not alluded to as type. The next reviser [1] to use *Porthetria* is Kirby, in *Cat. Lep. Het.*, i, p. 475, 1892, who selects *P. dispar* L. as the type. On page 477 Kirby also uses *Lymantria* with *L. monacha* L. as type.

Subsequent to Kirby, *Porthetria* and *Lymantria* appear to have been first combined in a single genus by Hampson, in *Fauna Br. India*, 1893, p. 459, where *Lymantria* is used for the combined genus, and *L. monacha* for the type.

Under Article 28 of the International Rules of Zoological Nomenclature it is laid down that where a genus is formed by the union of two genera of the same date, the name selected by the first reviser shall stand.

[1] I have found the exhaustive bibliography of *P. dispar* in Forbush and Fernold's *The Gypsy Moth*, Mass. State Bd. of Publications, 1896, of great use here.

I therefore use *Lymantria* Hübn. for the genus, type *L. monacha* Linn., a conclusion which has the advantage that *Lymantria* is perhaps the most popular of the several names used in the past.

I have made venation preparations of some fifty of the principal species in the genus. No comment on these is necessary, excepting to mention that there is considerable divergence between species in the distance of vein R^1 from the subcostal in the forewing. This, however, is not a stable factor, for in *L. turneri* Swinh., *L. lygaea* B.-Bak., *L. kebeae* B.-Bak., and doubtless others, specimens exist in which these veins anastomose, others in which they touch, and others again in which they run entirely free from each other.

Lymantria semicincta Wlkr. (Plate III, fig. 6).

Alope semicincta Wlkr., *List Lep. Ins. B.M.*, iii, p. 620 (1855).
Lymantria rhodina Wlkr., *List Lep. Ins. B.M.*, xxxii, p. 366 (1865).

The type of *L. semicincta* is a ♀, and the species is usually represented in collections by a good series of that sex. I have seen no mention of the ♂ in any account of the insect.

Although I can bring forward no actual proof, I am convinced after a careful comparison that the missing ♂ is standing in collections under the name of *Lymantria rhodina* Wlkr. I have figured a specimen of the ♂, as the representation in Seitz is poor.

Lymantria polysticta Collnt. (Plate III, fig. 11).

Lymantria polysticta Collnt., *Entom.*, lxii, p. 278 (1929).

♀. Palpus pale cartridge buff, on the outer side bistre. Antenna bistre, the basal third of the shaft cartridge buff. Head cartridge buff, the eye fringed with bistre, the hair-scales at the base of the antenna orange-buff. Thorax cartridge buff, mixed sparsely with bistre and orange-buff. Abdomen orange-buff. Pectus pinkish buff. Venter orange-buff mixed with bistre. Legs pinkish buff to cartridge buff, the tibiae ringed and spotted with bistre, the tarsi bistre. Forewing and fringe whitish, the bistre markings resembling those of the ♂, but considerably less heavy. Hindwing cartridge buff, inner marginal area tinged with light orange-yellow ; a rather indistinct snuff-brown crenate subterminal fascia ; a series of interneural snuff-brown spots, slightly invading the fringe, which is otherwise cartridge buff. *Underside* of forewing pinkish buff, inner marginal area cartridge buff ; a bistre streak along the costa as far as one-fourth, a spot on the costa above the discocellulars, a further spot postmedially and a smaller spot subterminally ; fringe cartridge buff, marked interneurally with bistre. *Underside* of hindwing pinkish buff ; a bistre spot on the discocellulars, a second near the apex, and a third near the anal angle ; fringe cartridge buff, marked interneurally near the apex with bistre.

Expanse : ♀ 68 mm.

1 ♀ (neallotype), Antsianaka and Lake Alaotra, Madagascar, April–June 1889 (Perrot Frères) ; British Museum ex Oberthür collection.

When describing the ♂ three years ago, from British Museum material, I did not detect the ♀, which has a much lighter hindwing and less heavy markings on the forewing.

Lymantria joannisi Le Cerf (Plate III, fig. 1).

Lymantria joannisi Le Cerf., *Bull. Mus. Paris*, p. 423 (1921).

♀. Strongly resembles the ♂. The postmedial fascia on the upperside of hindwing is continuous from costa to the 2nd anal vein, and the terminal margin of the hindwing is rounded and not projecting between veins M^3 to Cu^2 as in the ♂.

Expanse : 118 mm.

1 ♀ (neallotype), Diego Suarez, Madagascar ; Tring Museum.

Lymantria russula sp. nov. (Plate III, fig. 14).

♂. Palpus pinkish buff, on the outer side fuscous-black. Antennal shaft pale pinkish buff, pectinations pinkish buff. Head pinkish buff, with a tuft of orange-buff at the base of the antenna. Thorax pale pinkish buff. Abdomen above and beneath pale pinkish buff mixed sparsely with strawberry pink. Pectus and legs pale pinkish buff, marked on the tarsi and towards the distal end of the tibia with bistre. Forewing pale pinkish buff, crossed by numerous snuff-brown fasciae which are obsolescent and visible mainly as spots on and between the veins, the most prominent being an antemedial spot on the costa and two subterminal spots between Cu^2 and the anal vein ; the subterminal fascia appears to be roughly parallel with the termen ; a series of terminal interneural snuff-brown spots ; fringe whitish. Hindwing strawberry pink, mixed towards the termen with pinkish buff ; faint patches of snuff brown towards the apex, and near the termen between vein Cu^2 and the 2nd anal ; termen slightly angled between veins M^3 and Cu^2 ; fringe whitish. *Underside* of both wings pinkish buff, mixed sparsely with strawberry pink ; a faint snuff-brown spot on the discocellulars ; costal area of forewing cinnamon buff, and a series of faint terminal interneural snuff-brown spots ; fringes whitish.

Expanse : 48 mm.

1 ♂ (holotype), Diego Suarez, Madagascar, March 1917 (G. Melou) ; Tring Museum.

This species is nearest to *L. joannisi* Le Cerf (1921), which has also been taken at Diego Suarez, but has considerably longer antennae, with longer pectinations, and has, on the upperside of forewing, the subterminal lunule between veins M^3 and Cu^1 in line with the remainder of the fascia, and not considerably nearer the termen as in *L. joannisi*.

Lymantria velutina Mab.

Orgyia velutina Mab., *Bull. Soc. Zool. Fr.*, iii, p. 90 (1878).

A series of ♂♂ of this large and conspicuous species is included in most of the collections from Madagascar, but the ♀ is unknown. In some points of structure the species agrees well with *Numenoides grandis* Btlr. (1879), known only in the ♀ sex, but the differences in appearance and pattern are so considerable that it seems best to keep them separated for the present.

Lymantria monacha yunnanensis subsp. nov. (Plate III, fig. 3).

♀. Palpus and antenna fuscous. Head and thorax cartridge buff, mixed on the frons and at the base of the antenna with orange-buff, and sparsely on the patagium with fuscous. Abdomen strawberry pink, banded in the distal half with fuscous ; anal segments light ochraceous buff ; ovipositor extruded.

Pectus tawny olive. Venter fuscous, distally light ochraceous buff. Legs fuscous, mixed on the tibiae with tawny olive. Forewing whitish ; five fuscous patches on the costa at approximately equal distances apart, the first basally, the fifth near the apex ; a small fuscous spot in the cell and an angled fuscous streak along the discocellulars ; a fuscous patch postmedially on the inner margin ; traces of a crenate fuscous subterminal fascia ; a series of fuscous interneural terminal spots, continued round the apex and also on to the fringe, which is otherwise whitish. Hindwing pinkish buff ; a broad indistinct tawny-olive subterminal fascia ; a series of fuscous interneural terminal spots, continued on to the fringe, which is otherwise pinkish buff. *Underside* of both wings, and fringes, tawny olive, marked indistinctly as on upperside ; on the hindwing a fuscous discocellular spot and an indistinct postmedial fascia.

♂. Very similar to Swiss specimens of *L. monacha monacha* Linn., the markings on the forewing fine but distinct, the dark terminal band on the hindwing merging without a definite boundary into the ground colour.

Expanse : ♂♂ 41–44 mm., ♀♀ 66–71 mm.

1 ♀ (holotype), 1 ♂ (allotype), 2 ♀♀ and 4 ♂♂ (paratypes), Tse-kou, S.W. of Ta-tsien-lou, Yunnan, 1993 m., 1898 and 1903 (P. Dubernard) ; British Museum, ex Oberthür collection.

The ♂♂ bear considerable resemblance to specimens of *L. monacha monacha* Linn., but the ♀ is so abundantly distinct that I have no hesitation in describing it as a subspecies. This is borne out by the ♂ genitalia.

The ♂♂ have been illustrated and briefly described by Gaede in Seitz's *Grossschm. d. Erde*, ii, *Suppl.*, p. 102 and pl. 8g (1932), as a var. of *L. ascetria* Hübn., but, after comparison with the type of *L. ascetria*, it appears to me that they are not closely related to that species.

Lymantria concolor lacteipennis subsp. nov. (Plate III, fig. 4).

♀. Palpus and antenna fuscous. Head and thorax cream colour ; a patch of ochraceous tawny at the base of the antenna ; a broad patch of fuscous between the antennae and on the front of the thorax. Basal half of abdomen geranium pink, distal half cinnamon buff ; a fuscous spot dorsally on each segment and a further series laterally ; ovipositor extruded. Pectus and venter fuscous, with a patch of geranium pink laterally beneath the hindwing. Legs fuscous, with a patch of cream colour on the outer side of the mid-tibia, and a further patch distally on the tibia. Forewing and fringe cream colour marked with fuscous, the markings resembling those of *L. concolor concolor* Wlkr., but broader and heavier. Hindwing and fringe pale pinkish buff marked with fuscous, the markings heavier than in the ♀ *L. concolor concolor* and approaching those of the ♂ ; inner marginal area faintly tinged in the type and some paratypes with geranium pink. *Underside* of both wings, and fringes, cream colour marked with fuscous, the pattern as on the upperside but more heavy, especially on the hindwing.

♂. Distinguishable from ♂♂ of *L. concolor concolor* only by heavier markings.

Expanse : ♀♀ 53–61 mm., ♂♂ 48–52 mm.

1 ♀ (holotype), 1 ♂ (allotype) and 2 ♀♀ (paratypes), Ta-tsien-lou, Prov. Sze-chwan, China, 3,200 m., 1906 and 1910 ; 4 ♂♂ (paratypes), Tsekou, S.W. of Ta-tsien-lou, 1,993 m., 1898 and 1902 (R. P. J. Dubernard) ; also 1 ♀ and 1 ♂, Tien-tsuen, Yuin-kin, 700 m., 1897 and 1899 ; 1 ♀ and 2 ♂♂, Siao-lou, 1900 and

1903; and 1 ♀, "Frontière Orientale du Thibet," 1906 (R. P. Déjean); all British Museum, ex Oberthür collection.

I have separated these insects as a race of *L. concolor concolor* Wlkr., and this is confirmed by the genitalia. They may be distinguished in the ♀ sex by the geranium pink on the abdomen and the cream colour of the forewing, and in both sexes by the heavier markings. Two of the ♀♀ have been determined by M. Gaede as *L. superans* Wlkr. (see Seitz, *Grossschm. d. Erde*, ii, *Suppl.*, p. 101), but I find this is not confirmed by a comparison with Walker's type in the British Museum.

Lymantria fumida caliginosa subsp. nov.

♀. Distinguishable from *L. fumida fumida* Btlr. by the darker colour of forewing—Saccardo's umber as compared with tawny olive—and by the much less distinct pattern on the forewing.

♂. The colour distinction holds good also in this sex, while the markings on the forewing are reduced to a dark patch on the discocellulars. There is a well-defined collar of strawberry pink between head and thorax, the termen of the forewing is slightly less oblique and the apex more rounded.

Expanse: ♂ 43 mm., ♀♀ 61–66 mm.

1 ♀ (holotype), 1 ♂ (allotype) and 2 ♀♀ (paratypes), Vrianotong, Thibet; British Museum, ex Joicey collection.

In Seitz's *Grossschm. d. Erde*, ii, p. 127, *Lymantria fumida* Butl. of Japan is shown as a form of *L. dispar* L. Swinhoe, Matsumura and others have, correctly in my opinion, shown it as a separate species. The insect described above appears to be a well-defined geographical race of *L. fumida*, and may be a link between this species and *L. serva* Fab. of N. India.

Lymantria bivittata Moore (Plate III, fig. 7).

Pegella bivittata Moore, *Lep. Coll. Atk.*, p. 57 (1879).

♂. Antenna drab, on the outer side fuscous, tipped with strawberry pink. Antennal shaft fuscous, grading at the base to pale pinkish buff, pectinations Saccardo's umber. Head and thorax pinkish buff, with a double spot of fuscous dorsally on the thorax. Abdomen strawberry pink, pinkish buff at the base and with a series of fuscous spots dorsally. Pectus, venter and legs drab mixed with strawberry pink, the tibiae and tarsi marked with fuscous. Forewing whitish; two conspicuous fuscous subbasal spots, one above the cell, the other below the cell and slightly farther from the base; a few scattered snuff-brown antemedial spots and a conspicuous fuscous spot on the costa; a fuscous spot on the discocellulars; a double crenate snuff-brown postmedial fascia, the proximal portion at right angles to the inner margin, the distal portion parallel with the termen, arising close together from the inner margin at two-thirds, and each terminating with a fuscous spot on the costa; a series of subterminal interneural snuff-brown lunules, that between veins M^3 and Cu^1 more distad than the remainder; a series of terminal interneural fuscous spots, slightly invading the fringe, which is otherwise whitish. Hindwing pinkish buff, a faint snuff-brown spot on the discocellulars, and the termen broadly banded with snuff brown; fringe whitish. (In some specimens the hindwing is much darker and the terminal band not visible.) *Underside* of both wings, and fringes, pinkish buff,

with the markings of the upperside very faintly reproduced, and the basal one-third of the costal area fuscous.

Expanse : ♂♂ 54–62 mm.

1 ♂ (neallotype), Darjeeling, ex coll. Lidderdale ; British Museum. 3 ♂♂, Sikkim, 1,000–4,000 ft., and 1 ♂, Sikkim, 17.iii.1888 (O. Möller) ; 1 ♂, Sikkim, 2,000 ft., August 1895 ; Tring Museum.

Evidently a near relative of *L. brunneiplaga* Swinh. (1903), but sufficiently dissimilar therefrom in both sexes to be considered a perfectly distinct species.

Lymantria apicebrunnea Gaede (Plate III, fig. 12).

Lymantria apicebrunnea Gaede, Seitz, *Grossschm. d. Erde*, ii, *Suppl.*, p. 102 (1932).

♀. Palpus and antenna fuscous. Head and thorax pinkish buff, mixed on the frons with strawberry pink. Abdomen above and beneath cinnamon buff, dorsally on the basal segments mixed with strawberry pink. Pectus strawberry pink. Legs fuscous, mixed on the femora with strawberry pink. Forewing pale pinkish buff ; costa at the base narrowly snuff brown ; a streak of clay colour running from the costa at one-fourth oblique outwardly to the upper margin of the cell ; a broad clay-colour postmedial fascia running in a straight line from the costa at three-fifths, through the lower margin of the cell, to the inner margin at one-half ; fringe pale pinkish buff, marked interneurally with snuff brown. Hindwing pale pinkish buff ; inner marginal area faintly tinged with strawberry pink ; fringe pale pinkish buff, marked interneurally in the apical area with snuff brown. *Underside* of both wings pale pinkish buff ; fringes as on upperside.

Expanse : ♀♀ 84–86 mm., ♂♂ 57–64 mm.

1 ♀ (neallotype), 2 ♀♀ and 6 ♂♂, Lou-tse-kiang, Yunnan, S.W. of Ta-tsien-ou, 2,193 m. (R. P. Genestier) ; British Museum ex Oberthür collection.

Gaede described this species from a series of ♂♂ in the British Museum collection from Ta-tsien-lou, which according to L. Déjean (*Études Lép. Comp.*, vi, pp. 122–123, 1912) is in the dry zone at an altitude of 3,200 m. The British Museum also possesses a series of 6 ♂♂ and 3 ♀♀ from Lou-tse-kiang, ex Oberthür collection, from the wet zone at 2,193 m. The Lou-tse-kiang ♂♂ are slightly larger than Gaede's series, but seem to be otherwise indistinguishable, and I have therefore ventured to describe the ♀ from this series. I must mention that Gaede's type ♂, measured under my system (apex to centre of thorax, doubled) scales 56 mm., not 50 mm. as stated in his description.

Lymantria sakaguchii Mats.

Lymantria sakaguchii Mats., *Journ. Coll. Agric. Hokkaido*, xix, p. 26 (1927).

This species was described from a ♂ taken in Okinawa Island, Ryukyu Archipelago. In the British Museum is a ♂ from Oshima Island in the same group. It bears considerable resemblance to *L. apicebrunnea* Gaede, but is without the dark shading in the apex of the forewing.

In the Tring Museum are 2 ♀♀ from Ryukyu, June–August 1886, and as this sex has not yet been described, I have labelled one specimen as **neallotype.** It is scarcely distinguishable from the ♀ of *L. apicebrunnea* Gaede, described above, save that the postmedial fascia on the forewing is distinctly narrower, and that a streak of snuff brown runs oblique outwardly from the base of the costa almost to the anal vein.

Expanse : ♀♀ 83–84 mm.

Lymantria sphalera sphalera Collnt. (Plate III, fig. 2).

Lymantria sphalera Collnt., *Trans. Ent. Soc. Lond.*, lxxviii, p. 84 (1930).

♀. Palpus pinkish buff. Antenna sepia, the pectinations very short. Head and thorax pinkish buff, the frons tinged with pale flesh colour. Abdomen somewhat rubbed, but apparently cinnamon buff above and beneath. Pectus and femora pale flesh colour to flesh colour, tibiae and tarsi Saccardo's umber. Forewing drab, crossed by indistinct broad pale bands, directed as in the ♂, and tinged narrowly with pale flesh colour where they join the costa ; an indistinct spot in the centre of the cell, and slight darkening on the discocellulars ; fringe pale flesh colour, mixed interneurally with drab. Hindwing above and beneath, *underside* of forewing, and fringes, flesh colour to pale flesh colour, mixed interneurally on the fringes with drab.

Expanse : 89 mm.

1 ♀ (neallotype), New Ireland, November 1923 (A. F. Eichhorn) ; Tring Museum. 1 ♀, Ulul-Nono, New Ireland, 1917–1919 ; British Museum, ex Joicey collection.

At first sight there is little to connect the ♀ described above with the ♂ described in 1930. The relationship was first inferred from the fact that no other large *Lymantria* is known from the island, and it was then seen that the sexual dimorphism resembles that found in the better-known *Lymantria lepcha* Mr.

Lymantria sphalera talesea subsp. nov. (Plate III, fig. 8).

♂. Palpus pinkish buff, beneath and on the outer side fuscous. Antenna sepia. Head and thorax pinkish buff, tegula with a single fuscous spot near its base. Abdomen grenadine. Legs pinkish buff, the femora tinged with grenadine. Pectus and venter pinkish buff mixed with grenadine. Forewing pinkish buff ; some fuscous spots in and above the cell as in *L. sphalera sphalera* ; a very faint antemedial fascia, medial shade and postmedial fascia, of a darker shade of pinkish buff, following the same path as in *L. sphalera sphalera* ; fringe pinkish buff. Hindwing warm buff, i.e. of a slightly darker and warmer shade than the forewing ; fringe pinkish buff. *Underside* of both wings, and fringes, warm buff, with a conspicuous fuscous spot on the discocellulars of each wing and faint fuscous spotting round the apex and postmedially on the costa ; in and above cell of forewing tinged with grenadine.

♀. Similar to *L. sphalera sphalera*, but with considerable grenadine pink on the abdomen, and with a patch of flesh colour on the forewing reaching from cell to costa on the proximal side of the antemedial fascia.

Expanse : ♂ 75 mm., ♀ 126 mm.

1 ♂ (holotype) and 1 ♀ (allotype), Talesea, New Britain, March–April 1925 (A. F. Eichhorn) ; Tring Museum.

I have separated this form from the variable *L. sphalera sphalera* Collnt. (1930) of New Ireland, on account of the lighter ground colour and superior size.

In the Tring Museum are 2 ♂♂ from Rook Island and 5 ♂♂ from Manus, Admiralty Islands, which I am unable to separate from the insect described above.

Lymantria novaguineensis B.-Bak. (Plate III, fig. 16).

Lymantria novaguineensis B.-Bak., *Nov. Zool.*, xi, p. 407 (1904).

♀. Palpus snuff brown. Antenna fuscous, the pectinations very short. Head and thorax pale pinkish buff, mixed sparsely on the tegula with grenadine

pink. Abdomen above and beneath pinkish buff, mixed dorsally with grenadine pink. Pectus snuff brown mixed with pinkish buff. Legs much damaged in the type, but apparently mainly snuff brown marked with grenadine pink. Forewing whitish ; a small patch of snuff brown mixed with grenadine pink basally on the costa ; a snuff-brown antemedial fascia, at right angles to the costa, running in a straight line to the inner margin and decreasing in width on its path ; a double snuff-brown postmedial fascia, the proximal portion broad, the two portions roughly at right angles to the inner margin, running almost straight to the costa and diverging slightly on the way ; a series of terminal interneural snuff-brown spots ; fringe whitish, snuff brown interneurally. Hindwing grenadine pink, whitish towards the termen ; fringe whitish, mixed with snuff brown interneurally. Wings beneath grenadine pink, grading to whitish in the costal, apical and terminal areas of the forewing, and terminal area of the hindwing ; fringes as on upperside.

Expanse : 91 mm.

1 ♀ (neallotype), Milne Bay, British New Guinea, March 1899 (A. S. Meek) ; Tring Museum.

In describing this insect as the ♀ of *L. novaguineensis* I have been guided by the somewhat parallel case of *L. lunata* Stoll., and also by the fact that there is no other species from British New Guinea, known only in the ♂ sex, with which it could be associated. It can be easily distinguished from the ♀ of *L. lunata* by the straight antemedial fascia, the postmedial fascia at right angles to the inner margin, and the grenadine pink of the hindwing.

A ♀ from Geelvink Bay, in the British Museum collection, is very similar, but exhibits a faint preterminal fascia on the forewing and a slightly bowed (concavity basad) postmedial fascia. I have associated this insect with a long series of ♂♂ in the British Museum from Nomnagihé, near Wangaar, Geelvink Bay, at present shown under *L. novaguineensis*.

Lymantria doreyensis sp. nov. (Plate III, fig. 15).

♂. Palpus fuscous. Antennal shaft pale pinkish buff, pectinations tawny olive. Head, thorax and abdomen pinkish buff, with a sparse collar of strawberry pink between head and thorax. Pectus, venter and legs pinkish buff, mixed sparsely with strawberry pink. Forewing whitish ; a spot of strawberry pink at the base of the costa ; markings snuff brown to fuscous, resembling those of *L. nova-guinensis* B.-Bak ; fringe whitish. Hindwing and fringe whitish, inner marginal area shaded with pale yellow-orange, the margin produced to a slight angle between veins M^3 and Cu^2. *Underside* of both wings, and fringes, whitish, costa and apex of forewing faintly marked with fuscous.

Expanse : 42–45 mm.

1 ♂ (holotype) and 4 ♂♂ (paratypes), Dorey, N.W. of Geelvink Bay, Dutch New Guinea, June 1897 (W. Doherty) ; Tring Museum. 2 ♂♂, Mefor Island, Geelvink Bay, 15.viii–10.ix.1920, C., F., and J. Pratt ; British Museum.

Resembles *L. novaguineensis* B.-Bak., but considerable smaller, the antennae relatively larger, the abdomen without pink colour on the upperside, and the termen of the forewing less oblique. The genitalia are abundantly distinct.

In the British and Tring Museums are single ♂♂ from Ferguson Island,

Humboldt Bay, Stephansort, Sorong, Bachian and Ternate, which resemble the present species and *L. novaguineensis* B.-Bak., but show individual differences. They no doubt represent races of one of these two species, but in the absence of further material I have left them undescribed.

Lymantria buruensis sp. nov. (Plate III, fig. 9).

♂. Palpus bistre, tipped with pinkish buff, beneath at the base geranium pink. Antennal shaft pale pinkish buff, the pectinations long and bushy, sayal brown. Head and thorax pale pinkish buff (discoloured in the type), with a double spot of fuscous dorsally on the thorax. Abdomen geranium pink, a whitish stripe dorsally with a fuscous spot on each segment ; anal tuft whitish. Pectus, venter and legs pale pinkish buff mixed with geranium pink, pectus bistre in front, legs marked on the tarsi and towards the distal end of the tibia with bistre. Forewing pale pinkish buff marked with fuscous, the markings strongly resembling those of the smaller *L. nova-guinensis* B.-Bak., excepting that both portions of the postmedial fascia are bent more oblique inwardly where they join the costa, and that the subterminal fascia is slightly farther from the termen ; fringe whitish. Hindwing with inner marginal area strawberry pink, grading gradually to pale pinkish buff over the distal half of the wing ; a faint fuscous spot on the discocellulars, a fuscous subterminal patch near the anal angle, and a series of faint terminal interneural fuscous spots ; fringe whitish. *Underside* of forewing pale pinkish buff, a fuscous spot on the discocellulars, further spots along the costa and termen and in the apical area ; fringe whitish. *Underside* of hindwing pale pinkish buff, a fuscous spot on the discocellulars and interneural terminal spots near the apex ; fringe whitish.

Expanse : ♂♂ 65–69 mm.

1 ♂ (holotype) and 5 ♂♂ (paratypes), Gamoe 'Mrapat, Central West Buru, 5,000 ft., March–April 1922 ; and 2 ♂♂, Kako Tagalago, Central Buru, 2,700 ft., May 1922, C., F., and J. Pratt, in British Museum, ex Joicey collection.

A distinct species, nearest to *L. novaguineensis* B.-Bak.

Lymantria praetermissa sp. nov. (Plate III, fig. 13).

♂. Palpus drab, on the outer side fuscous. Antennal shaft pale pinkish buff, pectinations snuff brown. Head and thorax pale pinkish buff mixed with drab, the thorax lighter and with a spot of snuff brown near the base of the tegula. Abdomen strawberry pink, at the base pale pinkish buff ; anal tuft whitish. Pectus and venter pinkish buff mixed sparsely with strawberry pink, laterally on the venter a series of snuff-brown spots. Legs pinkish buff, mixed on the femora and distally on the tarsi with strawberry pink. Forewing whitish, marked with snuff brown and bistre, the pattern bearing much resemblance to that of *L. novaguineensis* B.-Bak., excepting that at the inner margin the postmedial fascia approaches closer to the antemedial fascia, and that the subterminal fascia is strongly crenate, with points on the veins and concavities terminad ; fringe whitish, snuff brown interneurally. Hindwing whitish, very slightly tinged with strawberry pink along the costa and in the inner marginal area ; fringe whitish. *Underside* of forewing, and fringe, whitish, faintly marked with

bistre and snuff brown in the costal and apical areas. Hindwings and fringe whitish, with a snuff-brown spot on the discocellulars.

Expanse : 48–55 mm.

1 ♂ (holotype), Buitenzorg, Java (Bogor) ; 2 ♂♂ (paratypes), Tjinjfroean, Gouv. Kina-Ondern, Malabar Geb., W. Java, 1,700 m., November 1909 (H. W. v. d. Weele) ; Tring Museum.

Nearest to *L. novaguineensis* B.-Bak. In the British Museum are three closely allied ♂♂ specimens from S.W. Sumatra, 7 ♂♂ from Central Ceram and 2 ♂♂ from Central Buru. These may probably prove to be races of *L. praetermissa*, but I think it better to leave them undescribed until such time as the ♀♀ are known.

Lymantria nephrographa Trnr.

Lymantria nephrographa Trnr., *Proc. R. Soc. Queensland*, xxvii, p. 23 (1915).
Lymantria mjöbergi Auriv., *Ark. Zool.*, xiii, 2, p. 26, pl. 1, fig. 1 (1920).

The type ♂♂ used in both these descriptions were taken on Mount Tambourine, Queensland. I have compared Turner's description of *L. nephrographa* with the coloured figure of *L. mjöbergi*, and have satisfied myself that the latter must sink.

Lymantria loacana Semp. (Plate III, fig. 10).

Lymantria loacana Semp., *Schmett. Philipp.*, ii, p. 462 (1898).

♂. Resembles the ♀ in colour and pattern, but less heavily marked on the forewing.

Expanse : ♂♂ 41–52 mm., average about 48 mm.

1 ♂ (neallotype), and 145 ♂♂, June 1912 and 1913, 2 ♂♂ March 1913, 3 ♂♂ April 1912 and 1913, 3 ♂♂ May 1912, all 5,000 ft., Banguio, subprov. Benguet, Luzon (A. E. Wileman) ; British Museum.

In this extensive series there is variation in the ground colour of the forewing from whitish to drab, and from a hindwing practically without marking to one with a well-defined subterminal fascia and a series of terminal interneural spots.

Lymantria cryptocloea Collnt. (Plate III, fig. 5).

Lymantria cryptocloea Collnt., *Nov. Zool.*, xxxvii, p. 178, 1932.

♀. Palpus pinkish buff, on the outer side bistre. Antenna bistre, the pectinations short. Head, thorax and abdomen, above and beneath, pinkish buff to snuff brown, the ovipositor extruded. Legs pinkish buff, the tarsi bistre. Forewing pale pinkish buff, the markings snuff brown and resembling those of the ♂, but considerably broader and heavier ; discocellulars fuscous, and a streak of fuscous below the origin of vein Cu^2 ; fringe pinkish buff, snuff brown interneurally. Hindwing pinkish buff, with a broad but rather faint subterminal fascia of snuff brown ; fringe pinkish buff. *Underside* of both wings, and fringes, pinkish buff, with the more prominent markings of the upperside faintly reproduced in snuff brown.

Expanse : 45–52 mm.

1 ♀ (neallotype), Kolambugan, subprov. Lanao, Mindanao, sea-level, 19.v.1914 (A. E. Wileman) ; 1 ♀, Klondyke, subprov. Benguet, Luzon, 800 ft., 11.v.1912 (A. E. Wileman) ; British Museum.

Lymantria kinta Collnt.

Lymantria kinta Collnt., *Nov. Zool.*, xxxviii, p. 97, 1932.

I described this species recently from a series of 10 ♂♂ taken in the Malay Peninsula.

In the British Museum, ex Joicey collection, are 5 ♀♀ from Bidi, Sarawak, 1907–1908 (C. J. Brooks), which agree with the ♂ in all details of colour and marking and appear to be conspecific.

Expanse : ♀♀ 53–56 mm.

This ♀ may be easily distinguished from the ♀ of *L. strigata* Auriv.—of which there is a specimen from Bidi, Sarawak, in the British Museum—by the dark reddish colour of the forewing as against the brownish colour in *L. strigata*, and also by the light buff hindwing marked lightly near the anal angle with hazel, as against the warm buff hindwing, with dark terminal band occupying nearly half the wing area, in *L. strigata*.

Lymantria serva Fab.

Bombyx serva Fab., *Ent. Syst.* (3), 1, p. 474 (1793).
Lymantria obsoleta Wlkr., *List Lep. Ins. B.M.*, iv, p. 880 (1855).

In the British Museum is a series of ♂♂ from Southern China (Tse-kou, Tien-tsuen, Siao-lou, Moupin, Omei-shan, Ta-tsien-lou and Hunan), which measure 33–39 mm., and are therefore smaller than N. Indian ♂♂ of *L. serva*. They do not appear to be otherwise separable.

The species in Ceylon has in the ♀ sex much geranium pink on the abdomen and hindwing, while in the ♂ the same colour predominates on the abdomen. These insects have appeared over a blank label in the British Museum for a number of years, but in Moore's *Lep. Ceylon*, ii, p. 100, Hampson's *Fauna of Br. India*, i, p. 461, and Swinhoe's *Revision*, *A.M.N.H.* (ix) 11, p. 427, specimens from Ceylon are included under *L. obsoleta* Wlkr. I have followed these authorities, as specimens from Ceylon seem doubtfully distinguishable from those taken in Southern India.

Lymantria inordinata barisana subsp. nov. (Plate III, fig. 17).

♂. Palpus strawberry pink, on the outer side fuscous. Antenna sayal brown. Head and thorax pinkish buff to sayal brown. Abdomen above and beneath strawberry pink, anal tuft light ochraceous buff. Pectus and legs strawberry pink mixed with pinkish buff, the tarsi marked with fuscous. Forewing pale pinkish buff (in some specimens orange-pink), mixed over the whole wing with sayal brown ; an indistinct sayal-brown antemedial fascia ; some bistre spots along the costa ; an angled bistre streak on the discocellulars and a conspicuous patch of bistre below the origin of vein Cu^2 ; a crenate sayal-brown postmedial fascia from the costa at three-fourths to the inner margin at two-thirds ; a

crenate sayal-brown subterminal fascia, approaching closely to the termen between veins R^5 to M^2 and M^3 to Cu^1 and finishing at the tornus; a series of bistre interneural terminal spots, continued round the apex; fringe orange-pink. Hindwing and fringe orange-pink. *Underside* of both wings, and fringes, orange-pink; discocellulars of both wings faintly marked with bistre; some patches of bistre along the costa of forewing.

♀. Strongly resembles the ♂, but with upperside of hindwing somewhat deeper in colour and marked with an indistinct series of interneural bistre terminal spots. Ovipositor extruded.

Expanse: ♂♂ 43–48 mm., ♀ 71 mm.

1 ♂ (holotype), 1 ♀ (allotype) and 2 ♂♂ (paratypes), Barisan Range, Western Slopes, S.W. Sumatra, 2,500 ft., October–November 1921; also 1 ♂ (paratype), North Korintji Valley, S.W. Sumatra, 5,000 ft., September–October 1921, all C., F., and J. Pratt, British Museum ex Joicey collection. Apparently conspecific are: 1 ♀, Mt. Dulit, Sarawak (Chas. Hose), British Museum collection; 1 ♀, Kuching, Sarawak, and 1 ♂, Mt. Gedeh, Java, August 1926, Tring Museum.

I have compared this insect with the type ♂ of *L. inordinata inordinata* Wlkr., 1865 (Celebes), which is at Oxford. The ♂ of the present subspecies is slightly smaller, and has shorter antennae. The interneural terminal spots of the forewing are smaller, and the subterminal lunule between veins M^3 and Cu^1 nearer to the termen, than in *L. i. inordinata*. The present subspecies has a distinct rosy flush over both wings, wanting in *L. i. inordinata*.

Lymantria pelospila Trnr.

Lymantria pelospila Trnr., *Proc. R. Soc. Queensland*, xxvii, p. 24 (1915).
Lymantria lutescens Auriv., *Ark. Zool.*, xiii, 2, p. 26, pl. 1, fig. 3 (1920).

I have compared a paratype of *L. lutescens* Auriv. with Turner's excellent description of *L. pelospila*. The stalking of veins *Rs* and M^1 in the hindwing is a distinctive feature, and the types are from Broome and Port Darwin respectively. I have no hesitation in stating that *L. lutescens* is a synonym of *L. pelospila*.

Lymantria nigrostriata Kenr. (1914) is a *Dasychira*.
Lymantria cerebosa Swinh. (1903) is a *Dasychira*.
Lymantria variegata Roths. (1915) is a *Dasychira*.
Lymantria griseata Roths. (1915) is a *Dasychira*.
Lymantria fusca Roths. (1915) is a *Dasychira*.
Lymantria nigrita Roths. (1915) is a *Dasychira*.
Euproctis castaneo-striata Kenr. (1914) is a *Lymantria*.
Euproctis canariensis Kenr. (1914) is a *Lymantria*.
Euproctis griseostriata Kenr. (1914) is a *Lymantria*.
Dasychira brunneata Kenr. (1914) is a *Lymantria*.
(*Dasychira didymata* Kenr. 1914) = *Lymantria dulcinea* Btlr. (1882).
(*Dasychira rufotincta* Kenr. 1914) = *Lymantria rosea* Btlr. (1879).

Ocneria signatoria militaris Obthr.

Lymantria militaris Obthr., *Bull. Soc. Ent. Fr.*, p. 386 (1914).
Ocneria signatoria algerica Obthr., *Lép. Comp.*, xi, p. 22, pl. cccxxx, Nos. 4727 and 4728 (1916); *Lép. Comp.*, xii, p. 293 (1916).

EXPLANATION OF PLATE III.

Fig. 1. *Lymantria joannisi* Le Cerf. Neallotype ♀.
,, 2. ,, *sphalera sphalera* Collnt. Neallotype ♀.
,, 3. ,, *monacha yunnanensis*, subsp. nov. Holotype ♀.
,, 4. ,, *concolor lactipennis*, subsp. nov. Holotype ♀.
,, 5. ,, *cryptocloea* Collnt. Neallotype ♀.
,, 6. ,, *semicincta* Wlkr. ♂.
,, 7. ,, *bivittata* Mr. Neallotype ♂.
,, 8. ,, *sphalera talesea*, subsp. nov. Holotype ♂.
,, 9. ,, *buruensis*, sp. nov. Holotype ♂.
,, 10. ,, *loacana* Semp. Neallotype ♂.
,, 11. ,, *polysticta* Collnt. Neallotype ♀.
,, 12. ,, *apicebrunnea* Gaede. Neallotype ♀.
,, 13. ,, *praetermissa*, sp. nov. Holotype ♂.
,, 14. ,, *russula*, sp. nov. Holotype ♂.
,, 15. ,, *doreyensis*, sp. nov. Holotype ♂.
,, 16. ,, *novaguineensis* B.-Bak. Neallotype ♀.
,, 17. ,, *inordinata barisana*, subsp. nov. Holotype ♂.

New species &c, of the GENUS LYMANTRIA

During my first search of the Oberthür collection in the British Museum some four years ago, I made a note that the type of *Lymantria militaris* Obthr. was not to be found. I have now no doubt that the several ♀♀ captured at Colomb-Béchar in 1912, and used as the material for the description of this species in 1914, were used again by Oberthür for *Ocneria signatoria algerica* in 1916! The latter must therefore sink. I have included the insect in *Ocneria*, although I am rather doubtful if the distinction between *Lymantria* and *Ocneria* can be maintained in its present form. I have also selected and labelled a "lectotype" for *O. signatoria militaris*.

ON *FREGETTA* BONAPARTE AND ALLIED GENERA.

By GREGORY M. MATHEWS.

(With Plates IV–IX, and two text-figures.)

IN order to name correctly the forms of *Fregetta* collected on the Tristan group, it was necessary to work up all the material available of the birds in this genus, including the species *grallaria* with which *leucogaster* has been confused.

When Bonaparte introduced his genus *Fregetta* in *Comptes Rendus Acad. Sci. Paris*, vol. xli, p. 1113, December 31st, 1855, he started off: "20 *Fregetta tropica* Bp. ex Gould," on the bottom of p. 1112, and on the next page says: "Parmi les genres et sous-genres que comprend ce groupe (*Procellariés*, généralement connus sous le nom de *Thalassidromes*), il en est un que j'ai nommé *Fregetta* dans la partie de mon *Conspectus* non encore publié. . . ." As a matter of fact, this part of his *Conspectus Generum Avium*, containing p. 198, did not appear till October 1st, 1857, with his name spelt *laurencii* given to a bird collected in Florida and called *Thalassidroma fregetta* Lawrence, not Kuhl; whereas this name spelt *lawrencii* appeared in the *Comptes Rendus*, vol. xlii, p. 769, on April 28th, 1856. He then gives his diagnosis and continues, "ce genre comprend la *leucogastra*, Gould, qui en est le type, et ma *Fr. lawrencii* prise pour elle en Amerique."

The genus *Fregetta* Bp. is diagnosed thus:

"Ce genre est bien caractérisé; son bec est petit, à tube nasal retroussé; ses ailes s'étendent bien au delà de la queue, que les pieds ne peuvent outre passer *malgré leurs longs tarses*, parce que le *podium* en est extremement court; les doigts sont gros et palmés jusqu'aux bords; les ongles petits, mais fortement deprimés. . . ."

He goes on to say, "la *melanogastra* Gould, bien distincte de ma *Thalassidroma oceanica* aux larges ongles de Grèbes presque humains, diffère à peine de la *leucogastra*."

This last sentence shows that Bonaparte was using Gould's *leucogaster*.

When Ridgway introduced his genus *Cymodroma* in *Mem. Comp. Mus. Zool. Harvard* (*Water Birds, North America*, vol. ii), vol. xiii, pp. 363 and 418, 1884 (introd. March 31st), he says: "So far as we are aware, the black-and-white Stormy Petrel is only known to have been taken in a single instance within our waters . . . on the Gulf Coast of Florida."

He said that the tail was even, the feathers exceedingly broad, with truncated tips; tarsus about twice as long as the middle toe without the claw (more than two and a half times as long as the culmen).

On p. 418 he uses this name *Cymodroma* to replace *Fregetta* Bp., the type of which he gives as *Procellaria tropica* Gould, not *Fregata* Briss. 1760. He then gives his generic characters as: small size; inner toe about equal to or slightly longer than the middle, which is decidedly shorter than the outer; claws very broad and flat, somewhat <> shaped; tarsus as given above; tail more than half as long as the wing, and even, the feathers extremely broad,

and truncated at the tip; plumage partly coloured. Only one species of this very peculiar genus belongs to the North American fauna, and this on account of its accidental occurrence on the coast of Florida. He then uses the name *Cymodroma grallaria*, of which he makes Gould's *leucogaster* a synonym.

The Storm Petrel which occurs in America is the one Lawrence mentions, who says that one of these birds was secured by Mr. John Hooper, of Brooklyn, N.Y., and which I believe to be *grallaria*.

Now, so far as I know, no one has written on these specimens since, and the type of *lawrencii* is presumed to be lost. Dr. Frank Chapman writes me that he has tried unsuccessfully to locate the type.

The description of *Thalassidroma fregetta* as given by George N. Lawrence on p. 117 of the *Annals of the Lyceum of Natural History of New York*, vol. v, pt. 2, for May 1851 is of specimens taken in the harbour of St. Marks, Florida, in the South of the United States of North America.

"Length about eight inches (= 203 mm.); wing from flexure six inches (= 152 mm.); tail three inches (= 76 mm.); tarsus $1\frac{3}{4}$ inches (= 34 mm.).

"Head and wings black; neck, breast and back dusky bluish ash or dark plumbeous; wing coverts brown; tail perfectly even, with the two central feathers black, the others white at the base for half their length, terminating with black; abdomen, inside covering of wings and rump white; bills and legs black.

"The claws are peculiarly shaped, being depressed, ovate and as broad as they are long.

"They were observed about the vessel during two days, after which none were met with."

This agrees very well with a winter-worn specimen of *grallaria*, except that no mention is made of the white edges to the feathers of the back, which may have been worn off. However, the measurements are about the same as those of the typical *grallaria*. Can we therefore with justice place *lawrencii* of Bonaparte as a synonym of *grallaria*?

Both Bonaparte and Ridgway record a Storm Petrel from America, but neither of these authors examined the skin as far as I can ascertain at present. There can be no doubt that about this time *grallaria* was mistaken for *leucogaster*, as proved by the works of these two authors. In his original description Gould does not mention the short toes, but he does in his folio work.

When Ridgway introduced *Cymodroma* he diagnosed the foot as having the inner and middle toe of about equal length and decidedly shorter than the outer. If we read inner for outer and outer for inner we get a perfect diagnosis of the foot of *leucogaster*, i.e. the outer and middle toe and claw of about equal length and the inner toe and claw shorter by 2 or 3 mm.

It seems at present that the Storm Petrel which was collected in Florida is *grallaria*, but that neither *Fregetta* or *Cymodroma* was founded on it. *Fregetta* Bp. type *leucogaster* by original designation. *Cymodroma* Ridgway, from his diagnosis, type *leucogaster* by present designation.

This author says that seven examples were "said to have been captured," so apparently were not included in the material he used. His measurements read: wing 6 to 6·5 inches (= 152–164), tail 3 to 3·3 (= 75–83), culmen ·50 (= 13), middle toe without claw ·80 (= 20 mm.).

Ridgway considered his genus to be equal to *Fregetta* of Bonaparte, which

he also considered preoccupied by *Fregata* Brisson 1760. Although he used *Cymodroma grallaria*, he put Gould's *leucogaster* as a synonym, showing that he mixed these two species. As shown above, his diagnosis fits the foot of Gould's bird and not *grallaria*.

KEY TO THE GENERA.

A. Toes wide and flat, claws not pointed.

a. Measurement from outside of inner claw to outside of outer claw, in life about equal in length to the middle toe and claw; that is roughly equilateral, as in *grallaria*. Basal joint of middle toe scaled. Outer toe and claw a little longer than the middle toe and claw, which is a trifle longer than the inner toe and claw (Pl. IX, figs. 3, 4, 5, 7) *Fregettornis*.

b. Measurement from outside of inner claw to outside of outer claw much less than the length of the middle toe and claw; that is roughly isosceles triangular, as in *tropica*, *leucogaster* and *lineata*. Basal joint of middle toe not scaled.

*a*¹. Outer toe and claw equal in length to the middle toe and claw; inner toe and claw shorter by a few millimetres (Pl. IX, figs. 1, 2, 6) . . . . . *Fregetta*.

*b*¹. Inner toe and claw shorter by four or five millimetres (Pl. IX, fig. 8) . . . . . *Pealea*.

B. Toes thin and claws pointed.

Foot isosceles triangular. Middle toe and claw longest; inner toe and claw shortest. Tail feathers narrow. Basal joint of middle toe scaled (Pl. IX, fig. 10) . . . . . *Pealeornis*.

Another way to distinguish the genera is:

A. First primary about as long as the third . . . . *Pealea*.
B. First primary shorter than the third.
a. Toes thin and claws pointed . . . . . *Pealeornis*.
b. Toes wide and flat, claws not pointed.
*a*¹. Foot equilaterally triangular . . . . *Fregettornis*.
*b*¹. Foot isosceles triangular . . . . . *Fregetta*.

In the 10th edition of Carl von Linné's work, p. 131, January 1st, 1758, is described the first Storm Petrel as *Procellaria pelagica* "in (albo =) alto oceano"; the type locality is restricted to Sweden. For this form three genera were proposed, viz. *Hydrobates* Boie 1822; *Thalassidroma* Vigors 1825; and *Zalochelidon* Billberg 1828. This bird has never caused any trouble; it is figured in Dresser's *Birds of Europe*, vol. viii, pl. 613, and Hartert, in *Die Vögel der Pal. Fauna*, vol. ii, p. 1410, 1920, has worked it up to date.

GENUS *FREGETTA* BONAPARTE.

Fregetta Bonaparte, *Compt. Rend. Ac. Sci. Paris*, vol. xli, p. 1113 (1855), type "*leucogastra* Gould."

KEY TO SPECIES.

(A. Not determinable . . . . . *F. fregata*).
B. Upper surface with narrow white edges to the feathers . *F. tropica*.
C. Upper surface with wide white edges to the feathers . . *F. leucogaster*.

In the 12th edition, p. 212, 1766 (pref. May 24th), Linné added another Storm Petrel as *fregata*, from " in oceano."

Latham, in *General Synopsis, Birds*, vol. iii, pt. 2, p. 410, No. 17, 1785, from an examination of a drawing in Sir Joseph Banks's collection, says that it is found in latitude 37° South. This is copied by Gmelin, 1789, p. 561. This bird has been a stumbling-block ever since.

When I published the second volume of my *Birds of Australia*, pt. 1, May 30th, 1912, on p. 38 I printed Solander's beautiful description of *fregata*, which is not the basis of Linné's name, and the type locality was fixed as the mouth of the Rio de la Plata on the east coast of South America. This bird was collected on December 22nd, 1768, and not brought to this country till 1771, but believed by Solander to be identical with Linné's bird.

FREGETTA FREGATA (L.). The Elusive Storm Petrel.

? *Procellaria fregata* Linné, *Syst. Nat.*, ed. xii, vol. i, p. 212, 1766 (pref. May 24th). Habitat in Oceano.

" *Frigate Petrel* " Latham, *Gen. Syn. Birds*, vol. iii, pt. 2, p. 410, 1785, Latitude 37° South.

Procellaria fregata Gmelin, *Syst. Nat.*, vol. i, pt. 2, p. 561, April 20th, 1789, Latitude 37° = mouth of the Rio de la Plata; Mathews, *Birds Austral.*, vol. ii, pt. 1, p. 38, May 30th, 1912 (ex Solander MS.), mouth of the Rio de la Plata.

The following is a description of Gmelin's bird:

Procellaria fregata, black, with the abdomen and rump white, the feet wholly black. *Linn. Syst.*, 212.2.

Figured.

Habitat in South American Ocean, S. Lat. 37° (December 22nd, 1768).

Variety; with black stripe on abdomen; in the Antarctic Ocean at South Terra del Fuego, S. Lat. 58° (February 2nd, 1769).

(*a*) Head, neck, breast, back, wings and tail black.

Throat ashy-white.

Abdomen, vent and rump white.

Feathers of crissum white at base, blackish at tip.

Under wing coverts, whitish.

Eyes black.

Bill shiny black.

Upper mandible with compressed awl-shaped hook, in front of the nasal tubes a deep short channelled groove running forward.

Nasal tube not attaining the middle of the bill, subcylindrical, with the end raised above the bill, and here entire, with the opening circular.

Lower mandible shorter, a little bent down at the apex.

Wings long and lanceolate.

Feet entirely deep black.

Nails very short, broad, oval, sharp.

Hind-toe small, sessile.

Tail short, even.

Rectrices 12, all black.

Length from tip of bill to end of tail, 7½ inches (190 mm.).

Width between tips of wings, 16½ inches.

Weight, 1⅝ ounces.

(*b*) Variety from the ocean at South Terra del Fuego, with a stripe from the breast along the middle of the abdomen to the crissum black ; otherwise very similar and also the same in size.

Now the point arises, is Linné's bird the same species as the one described by Latham in 1785 ? If not, it is indeterminable. Latham's and Gmelin's bird is of course the same as Solander's.

FREGETTA TROPICA (Gould).

Three subspecies :

FREGETTA TROPICA TROPICA (Gould). The Tropic Storm Petrel.

(Pl. VIII ; Pl. IX, figs. 1, 1a.)

In the *Catalogue of Birds*, vol. xxv, p. 365, 1896, this form was considered identical with *melanogaster*.

The following is a description of the type :

General colour of the upper surface blackish brown ; the head and back darkest and divided by the lighter feathers on the nape ; some of the feathers of the back have very narrow white edges ; upper tail coverts white, some of the feathers of the back, immediately above this white band, have large white bases and a wide subterminal black band and fringed with a narrow white end ; tail black, all but the central pair with white bases ; the central pair of tail feathers is the shortest, the next pair a little longer and so on till the outer pair, which is the longest ; shortest (central) pair measure 70 mm. ; the outermost 79 mm. ; primaries and secondaries black, the inner web lighter towards the inner edge ; the bases of the inner web fringed with white ; primary wing coverts black, remaining wing coverts brownish black like the nape of the neck ; throat whitish ; lores, sides of face, breast and chest dark brownish black, like the nape ; sides of the body, axillaries and most of the belly white ; the feathers of the abdomen have large white bases to the feathers for two-thirds of their length, the remaining third has a wide brown band, thus making a brown patch ; a few such brown feathers, with large white bases, connect the abdomen with the chest, but under no condition can it be called a band ; under tail coverts with extended white bases and ending with a wide brown bar, the longest under tail coverts are about half white and brown ; under aspect of tail feathers brown ; inner under wing lining white, surrounded by a widish band of brownish black running right round the wing ; under aspect of primaries brown ; under primary coverts light brown, all but the first fringed with white ; before the eye some of the feathers have white bases. Eyes brown, bill, feet and legs black. Total length 220 mm. ; wing 170 ; culmen 15 ; tail 79 ; tarsus 41 ; middle toe and claw 29 ; inner toe and claw 26. Lat. 6° 33′ N., Long. 18° 6′ W. The tarsus and basal joint of the middle toe is booted.

Another skin, from Lat. 0·2 S., Long. 30 W. (collected by the *Transit of Venus* Exp., Sp. b. in *Cat. Birds* ; pres. by Capt. Stanley), resembles the type in general appearance, the abdomen is perhaps a little more brownish, and this colour extends farther towards the chest. Many of the feathers on the back and wing coverts have a very narrow fringe of white ; it seems to be a younger bird. Wing 173 mm. ; culmen 16 ; tail 80 ; tarsus 40 ; middle toe and claw 29, inner toe and claw 26. Two specimens examined.

Distr.—This form does not appear to wander far from the type locality; this is on the equator, a little north, viz. 6° 33′ North Lat. and 18° 6′ West Long., off Sierra Leone. In the Atlantic Ocean. Perhaps breeding south of the line on Ascension Island, but this is not proven. Has occurred as far north as the Canaries. It appears never to have the decided black band running from the vent to the chest.

In the *Journal für Ornithologie* for 1905 Vanhöffen had a paper (pp. 500–515) on the German South Polar Expedition and a most useful map. In this he considers the northern distribution of the birds of the Tropics to be about 33° above the line in the Atlantic Ocean; and the Southern boundary a line from about 25° South, from South America, curving a few degrees farther south and then curving up to South Africa about 15° South. This, then, should be the distribution of *tropica*, as so far it has only been collected in this area. Vanhöffen's line is continued from the east of South Africa from about 27° S. curving a few degrees north to cut off the south of Madagascar, then curving south to the 30°, and running up to the North-West Cape in Western Australia to about 27° South. His other division is roughly about 65° South.

FREGETTA TROPICA MELANOGASTER (Gould). Black-bellied Storm Petrel.

(Pl. IX, figs. 2, 2a.)

Syn.: *Fregetta tubulata* Mathews, *Birds Austral.*, vol. ii, p. 42, May 30th, 1912. Near the coasts of (West) Australia.

In the *Catalogue of Birds*, vol. xxv, p. 364, 1896, this bird is put in the genus *Cymodroma*. The type locality is off St. Paul and Amsterdam Islands, breeding on Kerguelen Island. It is figured as *Thalassidroma melanogaster* by Gould in his *Birds of Australia*, vol. vii, pl. 62 (pt. xxvi), March 1st, 1847.

Adult, Male.—General colour above sooty black, darkest on the head; upper tail coverts white, some of the feathers of the back, immediately above the white feathers, have white bases; tail black, all but the central pair with white bases; the central pair of tail feathers is the shortest (70 mm.) and the outer pair the longest (80 mm.); primaries and secondaries black, the inner web lighter; primary wing coverts black, remainder of the wing coverts brownish; the under surface, including the throat, chest and a broad band running right to the vent, blackish brown; the feathers of the throat with white bases, which in the make-up of some skins gives a mottled appearance; some, but not all, the feathers of the brown band on the belly have white bases; others being uniform brown, lighter coloured at the base; the under tail coverts with large white bases, with the terminal third brownish; in some more brownish on the inner web only, and some with white fringes; sides of the body and axillaries white; under aspect of the tail feathers brownish black; inner underwing lining white, surrounded by a widish band of blackish brown running round the wing; under aspect of the primaries brown; under primary coverts light brown, all but the first fringed with white. Eyes brown; bill, feet and legs black. Total length 230 mm.; wing 172; culmen 15; tail 80; tarsus 42; middle toe and claw 28. Deception Island, South Shetland, December 26th, 1923.

Adult Female, collected at the same time and place, agrees, except that the

band on the belly is not so pronounced. Total length 220 mm.; wing 167; culmen 16; tail 77; tarsus 40; middle toe and claw 27.

A pair collected in South Lat. 42° 23′ and East Long. 20° 32′ (West of Prince Edward Island) agrees, but each sex is smaller than the corresponding one from Deception Island. Male: wing 163 mm.; culmen 14; tail 79; tarsus 39; middle toe and claw 27. Female: wing 163 mm.; culmen 14; tail 76; tarsus 37; middle toe and claw 26.

This form only sometimes seems to have the white throat of *F. t. tropica*, although it is suggested by the white bases to the feathers. In some skins a very narrow line of white fringes some of the feathers of the upper surface, but this is the exception in the material in hand, 9 from Kerguelen Island and west, at sea near there, 8 from New Zealand and Australia, 7 from South Shetland Island, 7 from the New York Museum, 6 from Tring Museum, 4 others from Australia, and some odd skins, making over 45 skins examined.

Fregetta t. melanogaster differs from *F. t. tropica* in not always having the white throat and in having the abdominal band always distinctly marked, not only indicated. The distribution, as at present known of each of these two forms, is divided by a distinct species, *F. grallaria tristanensis*, the tropical Storm Petrel only having been so far discovered near the line in the Atlantic Ocean. When we get a series of birds from the breeding locality, like South Georgia, we find them to be very constant. The feathers on the back in some few cases have very *narrow* white fringes, but could never be mistaken for *leucogaster* or *grallaria*.

a. **Fregetta tropica melanogaster** (Gould).

Distr.—Indian Ocean, Kerguelen Island (breeding), St. Paul and Amsterdam Islands. Apparently common from the Agulhas Bank, at the extreme south of Cape Colony, eastwards to Australia. (Occurring on west Australian coast probably.) The South Atlantic Ocean, breeding on South Shetland and South Orkney Islands.

b. **F. tropica australia** Mathews.

Distr.—South Pacific Ocean. Breeding on the subantarctic islands of New Zealand. Occurring on the east coast of Australia, and east up to Peru, 20 miles west of Cañete, June 26th, 1913.

c. **F. tropica tropica** (Gould).

Distr.—Atlantic Ocean only, about the equator, wandering as far north as the Canaries and as far south as Trinidad (breeding on Ascension ?).

While there are names for three subspecies of *tropica* corresponding to breeding habitats, it is very difficult to distinguish them. One typical form from the Atlantic Ocean, on the equator, which is *tropica*, and another, *melanogaster*, from the South Atlantic, Indian and South Pacific Oceans, would be a better way to treat them.

From the material sent over from the Mackay and Sydney Museums I find that *melanogaster* occurs off the eastern coast of New South Wales, and apparently is not rare.

The foot has the outer and middle toes with claw of equal length, the inner toe and claw shorter by 2½-3 mm.; the basal joint of all the toes is not scaled and the tarsus is booted. However, under a powerful magnifying glass, some

rudimentary scales are noticed on the inner and outer basal toe joints and near the top and bottom joints of the tarsus. In some specimens of *grallaria* the scaled tarsus is not always pronounced.

Key to the Subspecies.

a^1. Sides of body white ; vent and some feathers of the lower breast with dark tips . . . . . *F. t. tropica.*

a^2. Sides of body white ; distinct dark band from breast to vent.

b^1. Wing smaller . . . . . *F. t. melanogaster.*

b^2. Wing larger . . . . . *F. t. australis.*

FREGETTA LEUCOGASTER Gould. The White-bellied Storm Petrel.

Two subspecies : *F. l. leucogaster* and *F. l. deceptis.*

FREGETTA LEUCOGASTER LEUCOGASTER (Gould).

Thalassidroma leucogaster Gould, *Ann. Mag. Nat. Hist.*, vol. xiii, p. 367, May 1st, 1844, 36° S. Lat., 6° 47′ E. Long., collected by His Excellency Governor Grey, between Tristan da Cunha and the Cape of Good Hope. Gould, *Birds Austr.*, vol. vii, pl. 63, March 1st, 1847.

Cymodroma grallaria (not Vieillot), Godman, *Monogr. Petrels*, pt. 1, pl. 18, December 1907, and some of the letterpress.

As I pointed out in my *Birds of Australia*, vol. ii, pt. 1, pp. 35–44, 1912, *leucogaster* is not a synonym of *grallaria* Vieillot, but a different species, even a different genus ; cf. also *Birds of Norfolk and Lord Howe Islands*, p. 9, October 16th, 1928.

Gould's type of *leucogaster* collected by Governor Grey is still in the Bird Room of the Natural History Museum.

The bird figured in Gould's *Birds of Australia*, pt. xxvi, 1847, as *Thalassidroma leucogaster* has the basal toe joint showing scales. The shape of the foot, however, in spite of the scaled toes (which I think were added by the artist) show it to be the form named *leucogaster.*

This form has been the stumbling-block to many.

I think that Gould had one of the birds from Tristan (*tristanensis*) in his mind when he mentioned that *leucogaster* had shorter toes than *melanogaster*, because this is so of the Tristan birds, whereas in his own drawing no such shortness is apparent. Or perhaps he had a skin of *grallaria.*

Further in support of this are the two skins which Gould collected in the South Indian Ocean and labelled *leucogaster* now in the Melbourne Museum in Victoria, and these agree absolutely with Gould's type. In the letterpress Gould says that he encountered it generally over the South Indian Ocean.

Total length 7¼ inches (= 184 mm.) ; bill ¾ (= 18) ; wing 6 (= 152) ; tail 3 (= 76) ; tarsus 1½ (= 38) ; middle toe and claw 1 (= 25).

FREGETTA LEUCOGASTER DECEPTIS.

(Pl. VII ; Pl. IX, fig. 6.)

There is a form of Storm Petrel which resembles *leucogaster* in general appearance, and in a skin in the Tring Museum, from the H. Whiteley collection obtained off New Zealand, the under surface resembles that part of *leucogaster* ; the upper surface has the wide white fringes to the feathers. That is to say, this

form differs from *melanogaster* in lacking altogether the dark band from the chest to the vent, and in having wide white fringes to the feathers of the upper surface ; it differs from *leucogaster* in being larger in the wing. I have called it *Fregetta leucogaster deceptis* in the *Bull. B.O.C.* 1932, vol. lii, p. 146, June 28th. Six specimens examined.

The distribution of *Fregetta leucogaster deceptis* will then be the South Pacific Ocean, off New Zealand, type locality ; and the South Indian Ocean (cf. " *Emu*, vol. xxii, 1922 ").

A bird collected by Macgillivray on January 7th, 1853, in South Lat. 37½° and East Long. 42°, between Madagascar and Prince Edward Island, is of this form. The tail is about even, the central pair of feathers perhaps shorter than the outer ; the throat feathers have a white bar, the under tail coverts similar to those of *leucogaster* ; the longest under tail coverts reach to the tip of the tail feathers. Total length 210 mm. ; culmen 15 ; wing 163 ; tail 73 ; tarsus 40 ; middle and outer toe and claw 26 ; inner toe and claw about 2½ mm. shorter.

Adult (type of *deceptis*, Pl. VII ; Pl. IX, fig. 6).—General colour of the upper surface blackish brown, including the nape, back and scapulars ; the feathers of the back and scapulars with distinct white fringes ; top of the head and cheeks black ; upper tail coverts white, some of the feathers immediately above these white feathers have large white bases, followed by a blackish band and fringed with a less wide margin of white ; tail with the central pair of feathers the shortest and the outer pair the longest ; tail feathers black, all but the central pair with white bases ; primaries black, lighter on the outer edge of the inner web and whitish towards the base ; primary coverts blackish, secondaries and coverts lighter brownish ; bastard wing black, bend of the wing blackish brown ; throat feathers brownish at the base and tip, divided by a wide band of white ; the feathers of the breast brownish with lighter-coloured bases ; the lower breast, belly, vent and axillaries white, the feathers immediately above the white under surface have brown bases and tips divided by a large white band ; thighs brownish ; under tail coverts white with a broad subterminal band of brown and fringed with white ; the longest under tail coverts have the brown and white equally divided ; under aspect of primaries silver brown ; under primary coverts brown, all but the outer one fringed with white ; a band running round the outside of the underwing brownish with lighter edges to the feathers ; inner underwing lining white ; eyes brown ; bill, legs and feet black. Total length 230 mm. ; culmen 15 ; wing 167 ; tail 78 (central pair ; outer pair 80) ; tarsus 39 ; middle toe and claw 26, outer 26, inner 23. Collected off New Zealand. Tarsus booted ; toe joints flat, basal ones not scaled.

The sexes are alike.

Immature resembles the adults, after losing the down. *Nest and eggs* indistinguishable, no doubt, from those of *melanogaster*.

Breeding season, no doubt, the same months as *melanogaster*.

From the National Museum, Melbourne, Victoria, I have received three skins of *Fregetta tropica melanogaster*, and two of *leucogaster*, all determined by Gould, who presented the skins. These are the birds used by Messrs. Kinghorn and Cayley, *Emu*, vol. xxii, October 1922 : No. 1 from South Lat. 43° 18′ ; East Long. 140° 52′, a male ; the other two from the Atlantic Ocean, with no further data, these latter are called *tropica*, but have the dark band from the vent to the breast and are of course the subspecies *melanogaster*, if that form is admitted.

All three have the white throat, that is to say, the basal half of the throat feathers is white, the distal half brown ; all have imperceptible white fringes to the feathers of the upper surface, and the foot with the basal joints of the toes not scaled, in fact they are typical *Fregetta tropica melanogaster* and need worry us no more.

The two skins, a sexed pair, from the South Indian Ocean and no other data, determined by Gould as his *leucogaster* are of the utmost importance.

The male has the wide white fringes to the feathers of the upper surface ; back and scapulars dark blackish brown ; head, tail and primaries black ; throat feathers brown with a large white bar ; upper breast brownish ; from there to the vent pure white as in *grallaria* ; under tail coverts with large white bases to the feathers for two-thirds of the distance, followed by a wide band of brownish black, and fringed with white. Wings worn and measure 160 mm. plus the wear ; culmen 15 ; tail even ; the middle pair a trifle shorter ; tarsus 40 ; outer and middle toe and claw 28 ; inner toe and claw 25. The female is similar, but the white edges to the feathers on the upper surface not so wide. She also is a weather-worn specimen and we cannot see the shape of the tail or measure it with any certainty, nor can we be sure of the length of the wing. Wing 160 mm. plus wear ; culmen 14 ; tail 75 ; tarsus 41 ; outer and middle toe and claw 28, inner 25. What is of interest also is that this form occurs in the South Indian Ocean.

It cannot be the winter plumage of *melanogaster*, as we do not know of any petrel which has a breeding plumage. There is no doubt about its close relationship with *melanogaster*. The shape and formation of the foot will always separate it from *grallaria*.

F. leucogaster can always be separated from any form of *tropica* by the wide white fringes to the feathers of the upper surface. The winter specimens, instead of losing the white fringes, seem to retain them. As no form of *tropica*, even in perfect plumage, has such wide and pronounced fringes to the feathers of the upper surface, *leucogaster* can never be mistaken for it. Can it be that *leucogaster* has the white bases to the tail feathers of a different pattern from those of *melanogaster* ?

During the non-breeding season *leucogaster* and *melanogaster* occur at sea in the same area from South Africa through the Indian Ocean to New Zealand. However, *leucogaster* does NOT occur in the south of South America.

So far *leucogaster* has not been found breeding.

The birds mentioned as having been collected by Sir George Grey, erroneously said to be from Australia, have now been proved, from the British Museum register, to have come from Cape Agulhas, off South Africa, and are *leucogaster*.

The following is a description of the type of *leucogaster*. General colour above blackish brown, darker on the head and sides of the face ; feathers of the back with wide white fringes ; rump white ; tail black, all but the central pair with white bases ; primaries, secondaries and their coverts black ; middle wing coverts brown ; throat and breast blackish brown ; abdomen, sides of the body and vent white, like the inner underwing coverts ; under tail coverts white at the base and brownish at the end and tipped with white ; some of the longest coverts are half white and brownish ; under aspect of primaries greyish with white towards the base, on the inner web ; under primary coverts brown edged with white ; coverts round the bend of the inner wing brownish with lighter

edges. Lat. 35° 1′ South ; Long. 15° East. Total length 218 mm. ; culmen 15 ; wing 157 ; tail 75 (fan-shaped) ; tarsus 41 ; toe with claw 25.

KEY TO THE SUBSPECIES.

Wing measurement smaller	*F. l. leucogaster.*
Wing measurement larger	*F. l. deceptis.*

GENUS *FREGETTORNIS.*

Fregettornis Mathews, *Birds Austral.*, vol. ii, pt. 1, p. 31, May 30th, 1912. Type (by original designation) *Procellaria grallaria* Vieillot.

KEY TO THE SPECIES.

a^1. Uniform black	*F. royana.*
a^2. Under surface from breast white.	
Some white feathers with dark centres . . .	*F. guttata.*
No white feathers with dark centres	*F. grallaria.*

1. FREGETTORNIS GRALLARIA (Gould). White-fringed Storm Petrel.

(Pl. IX, figs. 3, 3a, 4, 4a, 5, 5a, 7, 7a ; text-fig. 2.)

Figured as *Fregetta grallaria* in my *Birds of Australia*, vol. ii, pl. 72, 1912, and in my *Birds of Norfolk and Lord Howe Islands*, pls. 6 and 10, 1928.

In the *American Museum Novitates*, No. 124, July 22nd, 1924, Dr. Robert C. Murphy proved that the type of *grallaria* did not come from Australia and restricted the type locality to the breeding form on Juan Fernandez Island. Wing of typical birds 153·9 mm. ; *innominatus* 160·8 ; *titan* 181·6. In the same publication, No. 322, July 14th, 1928, p. 4, Murphy named his large form *titan* ; he had 17 males and 10 females. The females slightly exceed the males in size ; in 63 skins measured from Juan Fernandez, the females also were slightly larger.

Now, *grallaria* occurs commonly in the South Pacific Ocean, between Australia and South America, and in the Atlantic, and we have four forms :

a. **Fregettornis grallaria grallaria** (Pl. IX, figs. 4, 4a ; text-fig. 2), breeding on Juan Fernandez group.

Thalassidroma segethi Philippi and Landbeck 1860, Chile, is a synonym.

b. **Fregettornis grallaria innominatus**, breeding on Lord Howe Island.

c. **Fregettornis grallaria titan** (Pl. IX, figs. 5, 5a, 7, 7a), breeding on Rapa Island, in the Australian group.

d. **Fregettornis grallaria tristanensis** (Pl. IX, figs. 3, 3a) ; see farther on.

I feel convinced that the following all refer to *grallaria* typical.

Thalassidroma fregetta Lawrence, *Ann. Lyc. Nat. Hist. New York*, vol. v, No. 3, p. 117, May 1851. St. Marks, Florida.

Fregetta lawrencii Bonaparte, *Comptes Rendus Sci. Paris*, vol. xlii, p. 769, 1856, April 28th. Florida, south of the United States (for the bird described by Lawrence in 1851).

Cymodroma grallaria Ridgway, *Mem. Mus. Comp. Zool Harvard* (*Water Birds, North Amer.*, vol. ii), vol. xiii, p. 419, 1884. Florida (for the bird described by Lawrence in 1851).

I have to thank my friend Mr. Harry S. Swarth for sending me over the

series of *grallaria* in the California Academy of Sciences, as used by Loomis; all these agree with other skins examined in having white fringes to the feathers of the upper surface and white underwing linings.

The one collected south of the Galapagos Island, in 4° 20′ South and 93° 30′ West, is nearest to the subspecies *titan* (wing 178 mm.) (cf. *Emu*, vol. xxii, p. 91, line 16, 1922), and the drawing of the foot, text-fig. 5, 5a, is from this specimen. It is smaller and lighter in colour than *titan*, with the fringes to the feathers on the upper surface very wide and not worn off. Wing 178 mm.; culmen 16; tail 85; tarsus 40; outer toe and claw 27; middle 26, inner 25. It has the same white basis to the tail feathers as *titan*. The other skins were all from off Chile and therefore the typical form.

From the Stockholm Museum, Professor E. Lönnberg has sent me a skin collected in Patagonia on February 20th, 1850, which agrees with the typical form. Wing 162 mm.; culmen 13; tarsus 37; tail 78; toes with claw 22.

In the *American Museum Novitates*, No. 124, July 22nd, 1924, the bird called *Fregetta lineata* on p. 7 is the same as the bird called *grallaria* on p. 9, cf. Murphy in a letter to me dated January 25th, 1932, or it can be called **Fregetta guttata** sp. nov., as it differs from *grallaria* in having the white under surface streaked with blackish brown.

FREGETTORNIS GRALLARIA TRISTANENSIS Mathews. The Tristan Storm Petrel.

(Pl. IX, figs. 3, 3a.)

Fregettornis grallaria tristanensis Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 123, April 30th, 1932. Inaccessible Island, Tristan da Cunha group.

Adult.—Head blackish; throat and upper chest dark blackish brown; the feathers of the throat are uniform brown, those on the upper chest have white bases to the feathers; lower hind neck, back and adjoining wing coverts dark brown, each feather with a white edge; some of the primary coverts black with white edges to the feathers; primaries black, with white bases, the smaller primaries and secondaries the same, but with a greyish wash; the secondaries have white edges to the feathers; rump white, like the under surface from the chest to the vent; the vent feathers are white with brownish-black tips; the longer ones blackish with large white bases to the feathers; some few are also tipped with white; tail even and black, the central pair all black, the remainder with white bases on the inner web. The under aspect of the wing has the feathers surrounding the bend of the wing from the axillaries to the primaries blackish, those immediately above the primaries with white edges; remainder of the inner wing coverts white; under primary coverts greyish, all but the first edged with white; the primaries show matt brown from the underside, not black as from above. Eyes brown. Bill, legs and feet black. Total length 193 mm.; bill 14; wing 160; tail 71; tarsus 38; middle toe and claw 24. Taken on Inaccessible Island, Tristan Group, on April 28th, 1923 (South Atlantic Ocean), now in the Scottish Museum. Five specimens examined.

An example in the Tring Museum taken in Lat. 37° 14′ S. and Long. 10° 5′ W., near Tristan da Cunha, on January 27th, 1904, has the inner underwing coverts white, surrounded by the usual blackish lining; vent white, longer under tail coverts black with white bases and narrow white fringes. The feathers of the

back dark blackish brown with white fringes. Wing coverts with few white fringes. Bill, legs and feet black; eyes dark chestnut. It measures: bill 14 mm.; wing 165; tail 78; tarsus 40; middle toe and claw 24.

The Tring Museum bird compared with the Scottish Museum bird is practically the same, even the dark band on the rim of the underwing has the same white edges to the feathers; the long dark under tail coverts with the white base, and white fringes. In the Tristan bird (April 28th, 1923) the primary coverts have perhaps more white fringes than the Tring specimen from near Tristan. The Tring specimen is lighter on the inner dark underlining of the wing, and is a female.

A skin in the Bird Room, from the South Atlantic, also is similar: wing 170 mm.; tail 79; culmen 15; tarsus 38; middle toe and claw, 23, outer 23, inner 22.

Distr.—Tristan da Cunha group, breeding on Inaccessible Island.

We have two skins of *tristanensis* in the Scottish Museum from the Gordon collection, one from Tristan da Cunha collected in 1919, with a wing 160 mm., and another collected on Inaccessible Island on April 28th, 1923, with a wing of 160. In one skin the outer web of the outermost tail feather is all black; in another all but the second from the outside have the outer web black, this feather has the white on both webs. In one skin there are only a few feathers on the upper surface with white fringes. In a series these birds seem lighter than *grallaria*; their wings measure 156, 160, 160, 167, 170 mm., the average being about the same as in *innominatus*.

In properly made-up skins the feet do just project beyond the tail. A skin in the South African Museum from Tristan measures: wing 156 mm.; tarsus 36; tail 76; the smallest skin examined.

In *Beiträge zur Zoologie*, etc., 1820, Kuhl has a monograph of the Petrels from p. 135 to p. 149, where he treats of twenty-seven species.

On p. 138 he has *Proc. Fregatta*, of which he makes *P. aquerea* a synonym. *P. Fregatta* is, of course, preoccupied by *P. fregata* L., so the next name is *aquerea*.

The author gives the measurements as: total length 203 mm.; wing 160; tail 82; tarsus 39; middle toe 20. And he gives a figure of the head; the bill measured in the usual way gives 15.

He ends his description by saying "Dorsi plumis albido marginatis"; this can only apply to *grallaria* or *leucogaster*, but which?

Type locality: off the east coast of South America. The mouth of the River de la Plata, Atlantic Ocean.

Should this name be used for my *Fregettornis grallaria tristanensis*, or is it indeterminable?

In the *Auk*, vol. xxxi, No. 4, October 1914, Dr. R. C. Murphy records that *F. grallaria* was seen in the South Atlantic from Lat. 7° 07′ to South Georgia.

2. **FREGETTORNIS GUTTATA** sp. nov. **Spotted-breasted Storm Petrel.**

Fregetta lineata (not Peale) Murphy, *Amer. Mus. Novit.* No. 124, p. 7, July 22nd, 1924. Huapu Island, in the Marquesas Group.

Adult.—Upper surface blackish brown, including the head, which is darkest, back, scapulars and wings; some of the feathers on the back and scapulars with white fringes; the four outer tail feathers have the outer web uniform black

and the inner web white at the base ; the four central ones being uniform black ; rump white, some of the feathers with a black tip ; primaries lighter on the inner web with white bases ; primary coverts blackish, wing coverts lighter ; throat and upper breast like the upper surface ; lower breast to the vent white, many of the feathers with a dark streak along the shaft ; under tail coverts dark brownish with white fringes ; under aspect of primaries brown, under primary coverts brown ; inner coverts and axillaries white ; the coverts running round the inner upperwing blackish brown. Eyes brown ; bill, legs and feet, including the webs, black. Total length, in the flesh, 203 mm. ; expanse of out-stretched wings 438 ; wing 165 ; tail 73·5 ; exposed culmen 14 ; tarsus 38 ; middle toe and claw 22. The three toes are subequal in length, the outermost being a shade longer than the others. The nails are flat and broadly triangular. The tail of twelve feathers is doubly emarginate, the central and lateral quills being of the same length. The tarsus has the reticulations perceptible.

Collected by Beck off Huapu Island, in the Marquesas Group, on September 15th, 1922. It was feeding in a streak of oily water in company with large numbers of *Bulweria* and *Fregetta grallaria*. It seemed to be a breeding female.

The sexes are alike in this genus.

The immature, nest and eggs are also presumed to be similar to those of *grallaria*.

3. **FREGETTORNIS MELANOLEUCA** (Salvadori). **The Black-and-White Storm Petrel.**

(Pl. IV ; Pl. IX, fig. 11.)

Fregetta melanoleuca Salvadori, *Bull. Brit. Orn. Club*, vol. xxi, p. 79, April 27th, 1908 ; " Tristan da Cunha " (the locality is in doubt).

Adult (type).—The upper surface, including the head, back, scapulars and wings, blackish, with no white fringes to the feathers ; rump white, some of the upper tail coverts with dark tips ; tail even, feathers black with white bases to all but the central pair of feathers ; throat and upper breast lighter than the back ; the feathers nearer the white abdomen have larger white bases than those near the throat ; lower breast to the vent white ; under tail coverts white with blackish-brown edges ; the longest coverts have the feathers half white and brown ; feathers round the upper leg brown ; primaries, secondaries and their coverts black ; upperwing coverts brown ; under aspect of primaries lighter ; the inner basal edge of the inner web white ; under primary coverts brown with white edges ; inner underwing coverts white ; the coverts running round the bend of the wing blackish brown ; under tail coverts black with white bases to the feathers. Total length 210 mm. ; culmen 14 ; wing 165 ; tarsus 41 ; tail 78 ; middle toe and claw 28, outer toe and claw 27, inner toe and claw 27.

This is a difficult bird to place, and I cannot match it in the long series of birds in front of me. The claws are different in shape from those of *tristanensis*. There is no sign of any scutellations on the tarsus or toe joints. The equilateral shape of the foot places it near *F. grallaria tristanensis*.

It was bought at the Bullock sale in 1819 by Professor Bonelli and is now in the Turin Museum in Italy.

Distr.—Not determined accurately.

4. FREGETTORNIS ROYANA Mathews. The Black Storm Petrel.

Cf. Mathews, *Birds of Norfolk and Lord Howe Islands*, October 16th, 1928, pp. 7–12, plates 5–10.

Many of the tube-nosed birds are dimorphic, such as *Pterodroma neglecta* ; *Macronectes*, etc. This we know from proved facts, which have helped us much in other cases. With a proven case all is of course easy, but a certain school considers, without, in my opinion, sufficient reason, that many more petrels have two phases. This is a nice lazy way of getting rid of trouble, but is it scientific ? Science is knowledge set in order. Surely guessing cannot be the correct way of going to work. This upas [1] poison started years ago in California, and flourishes in other parts of the world.

When we get many skins of *Fregetta grallaria* from its breeding-grounds, that is, Santa Clara Island and Rapa Island (two different subspecies), we find them resembling each other like peas in a pod. Now we get another subspecies breeding on Lord Howe Island ; these also resemble each other, and in general those of the other two forms. They all have white fringes to the feathers on the upper surface and white under wing coverts and a decided white rump.

Also breeding on Lord Howe Island is a bird of the same size as the subspecies of *grallaria*, but a uniform black ; Mr. Roy Bell, who collected for me for a year on this island, sent me the wings of about twenty birds, the bodies of which had been eaten by cats, so it is presumed to be fairly common. This I named *royana*.

He also sent me two adults and one immature, with down still adhering to the head, of a form I named *alisteri*.

Another bird lent me from the same island I named *howensis*.

In the *Emu*, vol. xxii, pt. 2, October 1922, pp. 81–97, Messrs. Kinghorn and Cayley have a very useful and interesting paper on these birds, with a coloured plate, and photos of the back and front view of *leucogaster* and *melanogaster*, plates 28 and 29. On plate 27 they give a photo of the underside of three birds, which may show the dark *royana* blending into the white-bellied *alisteri*. All these have dark underwing coverts.

In *alisteri* the rump and upper tail coverts are never all white ; the same remarks apply to *howensis*. Now, it may be possible, by that unscientific process called analogy, to say that *alisteri* and *howensis* are the same as *royana*.

Also breeding on Lord Howe Island is a bird about the same size as the above, which I called *insularis* ; this bird has a decided white rump ; the inner underwing coverts white, the entire under surface from the breast to the under tail coverts white, but the feathers of the upper surface without the white fringes, except two or three feathers in the middle of the back.

In my *Birds of Norfolk and Lord Howe Island*, October 16th, 1928, I give a plate of each of these forms, and one of their feet.

After *grallaria* loses its down, it always has white edges to the feathers of the back and wings, or, as in worn specimens, the frayed edges showing where the white tips have broken away. I have found *no exception* to this in the long series of about 180 skins examined.

I have now examined twelve skins of *Fregettornis* from Lord Howe Island, that is, the entire material available to date. There are three of the form *innominatus* which agree in all essentials with each other and disagree with the

[1] The upas tree was said to asphyxiate those who came under its influence.

other nine. All other forms of *grallaria* agree in all essentials with their fellows. So far this is easy.

When we examine the other nine skins we find them to vary in a way not found in the long series of 180 skins of *grallaria* and its subspecies. What does this indicate ? These nine birds have the feathers of the back uniform, without the white fringes to the feathers, even in the one with down still adhering to the crown of the head. We have two skins of the uniform *royana* ; another with the vent whitish ; another with still more of the under surface whitish ; three of the form *alisteri* ; one of *howensis* and one of *insularis*. That is to say, that they agree with each other in having the upper surface alike, and disagree with any form of *grallaria* ; on the under surface we have the uniform *royana*, connecting through *howensis* and *alisteri* with *insularis* ; this last form is not so easy to place.

When this series is examined together, it is impossible to consider them as all one species. I prefer to consider *innominatus* as a subspecies of *grallaria* ; and if we must unite the ones without the white fringes, the oldest name is *Fregettornis royana* 1914, with *insularis* 1915, *alisteri* 1915, and *howensis* 1928 as synonyms. The series of *alisteri*, *royana* and *howensis* have a tarsus with the constant measurement of 36 mm., the three *innominatus* 37–39 and *insularis* 38.

On going through the series with Dr. Percy Lowe, of the British Museum, he considered that there were two species : the form of *grallaria* which had retained through life the juvenile character of the white fringes to the feathers of the upper surface ; and another form which, as shown by the skin with down still adhering, never has these fringes.

The measurements of the tail feathers seem to vary too much to be used as a character ; the white bases to the tail feathers, however, seem more constant. In typical *grallaria* and *titan* the outer web of the outer tail feather is practically all black, the inner web white for half its length, the next two feathers have the base of both webs white, sometimes also the fourth as well. The fourth and fifth have the outer web light greyish and the inner web white ; the central feather all black, sometimes the feather next to it also is uniform.

In *tristanensis* the outer web of ALL the feathers is black, the inner being white in all but the central pair. In one case the second feather from the outside has both webs white.

GENUS *PEALEA*.

Pealea Ridgway, *Auk*, July 1886, p. 334 ; type by original designation : *Thalassidroma lineata* Peale.

Similar to *Fregetta*, but first primary longer than the third instead of much shorter ; basal joint of middle toe equal to or shorter than the rest of toe and claw instead of much longer.

PEALEA LINEATA (Peale). The Lined Storm Petrel.

(Pl. VI ; Pl. IX, figs. 8, 8a.)

Thalassidroma lineata Peale, *U.S. Explor. Exped.*, vol. viii, *Birds*, p. 293, October 1848 ; Upolu, Samoa. Cassin, *ib.*, 2nd ed. p. 403, pl. 39, 1858.

Adult, Male (type).—General colour above uniform sooty black, including the head, nape and back ; primaries, secondaries and their coverts black ; tail black all but the two central tail feathers with the inner web white at the base,

for about half the length of the feather, the white running back obliquely from a point on the shaft ; the shaft white as far as the white inner web, black from thereon ; rump white, some of the feathers on the lower back bordering this white have dark bases and white tips with a broad, irregular black subterminal band ; some of the white rump feathers with a dark shaft streak at the tip ; throat mottled, the feather with white bases and dark tips ; lower breast and chest sooty like the back ; from the chest to the vent white, all the feathers with wide black cuneate streaks at the tip ; under tail coverts projecting to 10 mm. from the end of the tail feathers, black with white bases ; under aspect of primaries sooty with no white on the inner web or base ; lower underwing coverts sooty with light fringes ; next series with wide white fringes ; the coverts round the bend of the wing sooty. Total length 187 mm. ; culmen (exposed) 14 ; wing 166 ; tail 76 ; tarsus 34·5 ; middle toe and claw 31, outer toe and claw 30, inner toe and claw 25. This skin still remains unique.

I have to thank Mr. J. H. Riley, of the Smithsonian Institution, Washington, D.C., for much help ; he pointed out the generic characters of *Pealea*, corrected my description of the type and gave the measurements. We now have a modern description. The type was collected on the island of Upolu in Samoa ; the native who obtained the specimen stated that the birds " bred in holes, very high up in the mountains." If this is so, no doubt the species has been exterminated by the vermin.

Peale says " the toes remarkably broad and flattened ; wings when closed projecting one inch beyond the tail ; toes reaching three-quarters of an inch beyond the tail."

The drawings here published are made from the sketches sent me from Washington, taken from the type, of the upper and under view of the wing and expanded tail and of the foot. The colouring is taken from the painting by Peale published in 1858.

In the *Check List of Birds of the World*, 1931, p. 70, Mr. J. L. Peters says that " Dr. Murphy tells me that *lineata* is only a phase of some species of *Fregetta*." With this I do not agree.

In the *Auk* for 1886, July, p. 334, where Ridgway introduced the genus *Pealea*, he says that the claws are very broad, flat and blunt, that the tarsus exceeds in measurement that of the middle toe with claw by the length of the culmen (to nasal tube) and that the first primary is equal in length to, or longer than, the third. He compared this bird with *Oceanites*.

GENUS *PEALEORNIS* MATHEWS.

Pealeornis Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 132, 1932 ; type : *P. maoriana*.

The foot of this bird, compared with that of any of the other Storm Petrels, is of quite a different shape. It is long and thin. When spread out and measured from the outside of the outer claw to the outside of the inner claw, the result is 20 mm. The inner toe is shorter than the middle and outer, which are almost equal ; middle toe and claw measures 28 mm.

The basal joints of the toes are narrow and round, not broad and flat. Perhaps the middle basal toe joint is a trifle flattish.

I consider that *Pealeornis* is a perfectly good genus on foot construction ; as is *Fregetta* with a foot shaped like an isosceles triangle and *Fregettornis* with its

equilateral-shaped foot, which measures 23 mm. from outside to outside and the same for the length of the middle toe and claw.

If a foot, spread out as in life, of *lineata*, *maoriana*, *grallaria* and *tropica* is examined, the structural differences are manifest and more easily understood than by all the writing. Cf. Pl. IX.

Dr. J. Berlioz has sent me a drawing of the foot of the two supposed *lineata* in the Paris Museum, collected by Quoy and Gaimard in *L'Astrolabe* in 1829, from New Zealand. I examined and measured these in 1930. This drawing agrees with the foot of the bird in the British Museum and disagrees with the foot of *grallaria*.

Mr. L. Delapchier also sent me drawings of the leg and foot of the type of *grallaria* and two views of the leg and foot of the *Pealeornis* in the Paris Museum.

The upper surface of these two specimens in Paris is very like that of *grallaria*, but is darker, nearly black; the wing coverts are paler brownish. One bird has some very faint whitish fringes to several feathers of the back; the other has the back entirely black. Compare drawing of the foot of *lineata* (= *Pealeornis*) and *grallaria*. *Ibis.*, July 1933, p. 546, Pl. XVIII.

A—Pealeornis maoriana.
B—Fregettornis grallaria.

My friend Dr. J. Berlioz, who has been most helpful in comparing *grallaria* with his two specimens of *Pealeornis*, says: "Certainly the legs and feet of *Pealea* (= *Pealeornis*) and *Fregettornis grallaria* are very different, the former thinner with the toes longer and much slenderer; while *Fregettornis* is a heavier-built bird with toes short and broad.

"In *Pealea* (= *Pealeornis*) the rectrices are not as broad as those of *grallaria*. All except the middle ones have very sharply defined white bases, the white, as you say, more extended on the inner web.

"One of the specimens has the base of the outer web of the outermost rectrice distinctly white, this being much reduced, nearly obsolete, on the other specimen. However, there is always a very short white base on the outer web of all the external rectrices and a larger one on the inner web."

The shape of the foot of *Pealeornis* belongs to the thin-toed genera like *Oceanites* and *Garrodia*, but much nearer the former.

Pelagodroma is quite distinct, the foot is more like that of *Fregetta tropica*, but the basal toe joints are scaled and the basal joints of all the toes more rounded and it is of course longer. In all these the inner toe is distinctly the shortest. In *Fregettornis* all the toes are of about equal length.

PEALEORNIS MAORIANA Mathews. Maori Storm Petrel.

(Pl. V; Pl. IX, figs. 9, 9a, 10, 10a; text-fig. 1.)

Pealeornis maoriana Mathews, *Bull. Brit. Orn. Club*, lii, p. 132, 1932; Bank's Peninsula, New Zealand.

Distr.—New Zealand only (breeding on Bank's Peninsula ?).

The following specimen was erroneously considered to be *Pealea lineata*. General colour above black, including the head, back and tail; upper tail coverts white, some of the feathers of the back immediately above the white rump have

white bases, followed by a broad black band and fringed with white ; tail feathers black, all but the central pair with white bases ; this white is more extended on the inner web ; the tail feathers even in length and narrow in structure ; primaries black, lighter on the inner web towards the edge ; secondaries blackish brown ; primary coverts black ; remainder of wing coverts brownish ; under surface with the feathers of the throat with white bases and brown tips giving a mottled appearance ; chest blackish brown ; abdomen, vent and sides of the body white ; running down the sides of the body many of the feathers have a dark line along the shaft ; some of the feathers round the thighs brown ; under tail coverts with white bases and a broad black terminal band ; under aspect of primaries matt ; underwing lining with a broad blackish band running round the edge of the wing ; inner underwing linings and axillaries white ; bill, feet and legs black ; eyes dark brown. Total length 180 mm. ; exposed culmen 13 ; wing 150 ; tail 68 ; tarsus 36 ; middle toe and claw 28, outer toe and claw 27, inner toe and claw 24. Taken off Bank's Peninsula, New Zealand. Type in the British Museum. Three specimens.

In the foot of this bird it looks as though the webbing was cut out and then the toe joints glued on ; while in the feet of the other species it gives the impression that the webbing was split open and the toe joints placed inside and then the upper covering pressed on to the joints, so different is the structure.

The tarsus is imperceptibly scutellated, as is the basal central toe joint. This toe joint is perhaps flattened on the upper surface.

Bonaparte, in his *Conspectus*, vol. ii, p. 200, October 1st, 1857, had a skin collected by the Astrolabe Expedition in 1829 (No. 254) in New Zealand on "*Promontorio orientali*," which is Bank's Peninsula. He placed this bird in the genus *Oceanites*, the feet more nearly resembling the feet of *oceanicus* than those of any other Storm Petrel. If the genus *Pealeornis* is not admitted, then *maoriana* must be included in *Oceanites*, as it does not fit into *Fregetta*, *Fregettornis*, or *Pealea*.

Dr. A. Wetmore has kindly had drawn for me the foot of the type of *lineata*. If we examine this drawing we see at a glance that it has nothing to do with *grallaria* of Vieillot.

If we compare this drawing again with the drawing of the foot of the bird in the Natural History Museum, *Pealeornis*, and of the feet of the two specimens in Paris, we see that it also differs considerably. I therefore named the New Zealand bird as new.

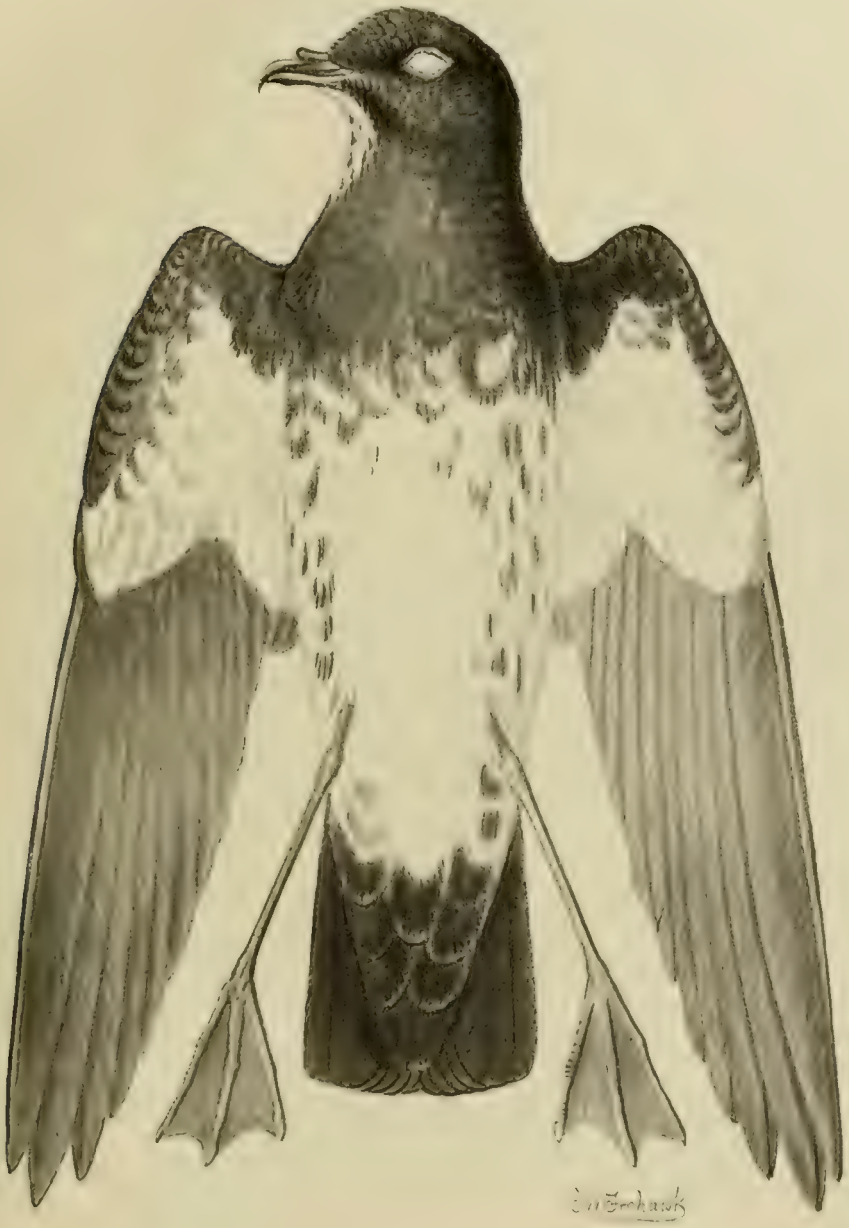
The foot of the type *lineata* was drawn by Mrs. A. M. Awl, and the foot of the bird in the British Museum by Mr. F. W. Frohawk.

Now, instead of having *Pealea* a varying species, the specimen remains unique ; the supposed *Pealea* from the Marquesas turns out to be *Fregettornis grallaria*.

The following is Dr. Wetmore's letter :

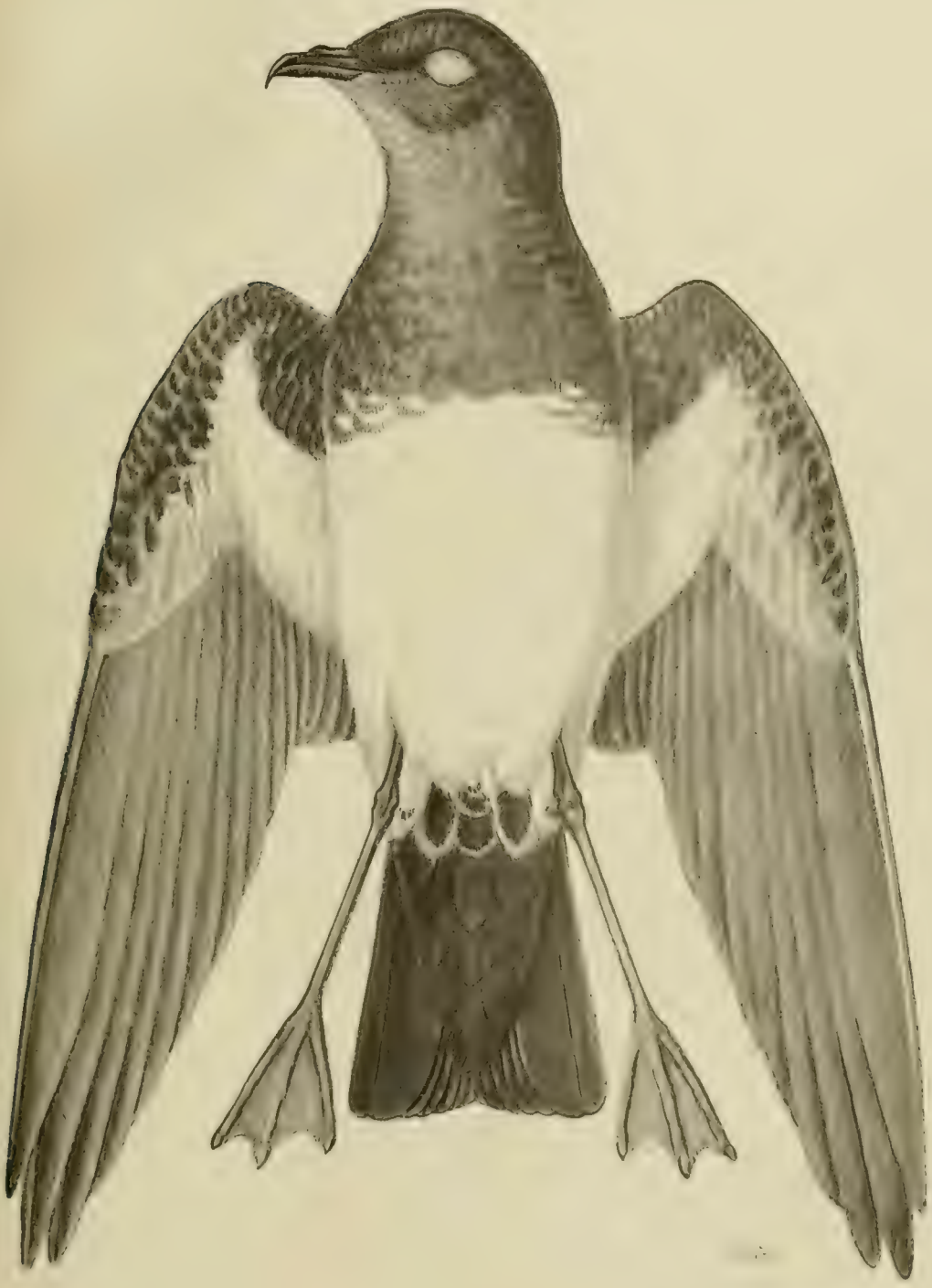
"In reply to your letter of March 15th, 1932, Dr. Friedmann, Mr. Riley and I have all examined the type specimen of *Pealea lineata*. To answer your questions the basal toe joints in our specimen of *Pealea* are smooth, without indication of scales. I have verified this under a lens. The middle toe has the basal joint flattened, while the one on either side has the basal joint rounded. The tarsus is booted.

FREGETTORNIS MELANOLEUCA, type.



PEALEORNIS MAORIANA, type.

PEALEA LINEATA, type



FREGETTA LEUCOGASTER DECEPTIS, type.

FREGETTA TROPICA TROPICA, type.

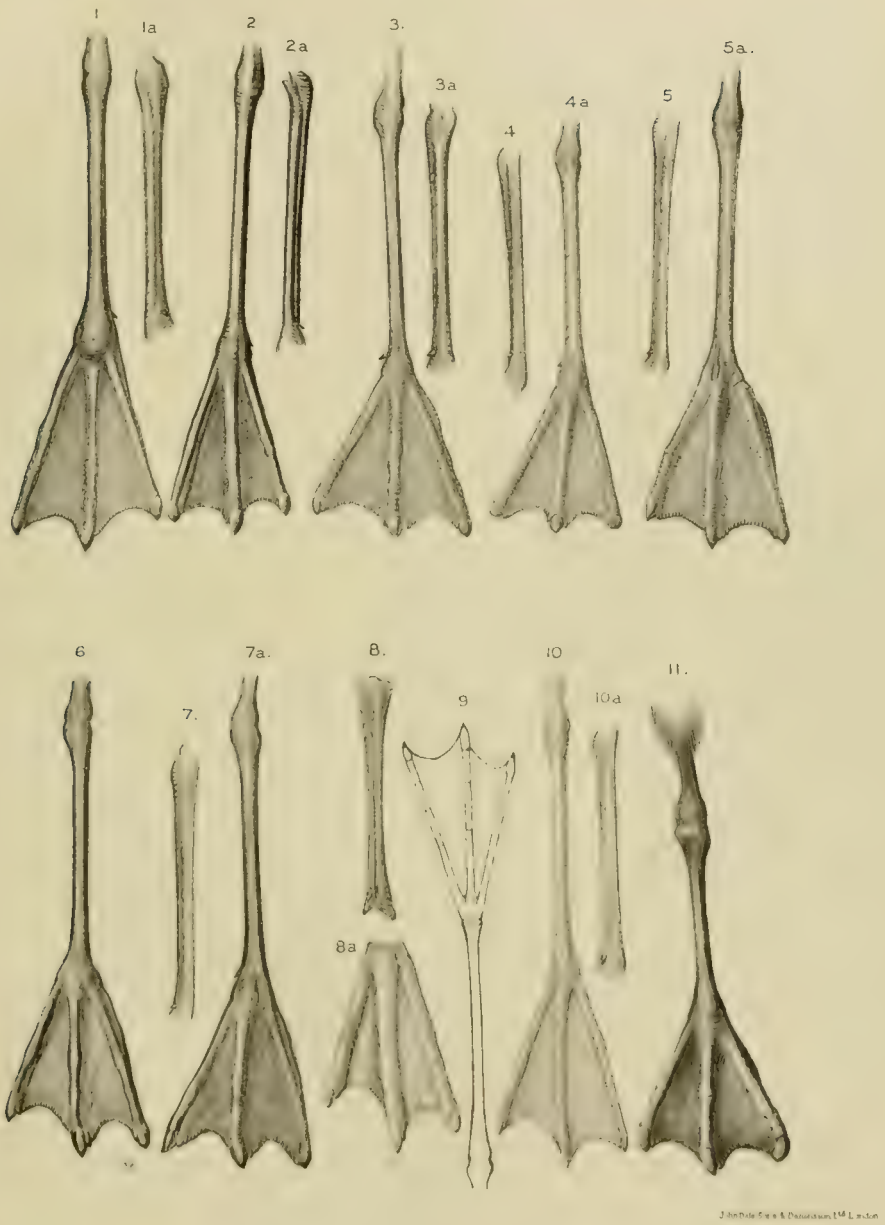


Fig 1,1a FREGETTA TROPICA TROPICA, type. Fig 2,2a FREGETTA TROPICA MELANOGASTER, type
Fig 3,3a FREGETTORNIS GRALLARIA TRISTANENSIS, type Fig 4,4a. FREGETTORNIS GRALLARIA GRALLARIA, type id
Fig 5,5a. FREGETTORNIS GRALLARIA TITAN, (Galapagos Is). Fig. 6 FREGETTA LEUCOGASTER LECHLER, type
Fig. 7,7a. FREGETTORNIS GRALLARIA TITAN. Fig. 8,8a. PEALEA LINEATA, type
Fig 9 PEALEGRIS MAORIANA (Paris Museum) Fig 10,10a PEALEORNIS MAORIANA, type (British Museum)
Fig 11. FREGETTORNIS MELANOLEUCA, type.

"When Mr. Ridgway made the genus *Pealea* he had only the type before him.

"In distinction from all this *Fregetta* has the toes scaled.

"While it seems barely possible that *Pealea* is simply a colour phase of *Fregetta*, at the same time it is necessary to recall that several specimens of *Pealea* are now known. It is true that it has the proportions of *Fregetta*, but the plumage certainly appears quite different. I would suggest that you try to verify the scalation of the foot from another specimen. The type is very old, and it is barely possible that there has been a change due to some sweating or deterioration, although on careful examination I find no indication of this. From what I have seen I should consider *Pealea* as a distinct species, in which Friedmann and Riley concur."

Dr. Sanford has sent me a life-size painting of the supposed *Pealea* taken in the Marquesas Island in 1922, together with a drawing, twice life size, of the foot. This confirms Dr. Murphy's statement already quoted, that this skin is a *grallaria* type of bird. The dark centres to the feathers on the white area on the under surface are extraordinary; this feature apparently has nothing to do with the dark lines noticeable in *lineata*. The feet do not project beyond the tail and the toes are of about equal length. *See* ante under *guttata*.

Pealeornis can always be distinguished from all other Storm Petrels by the narrow tail feathers and by the slender delicate tarsus and foot, the claws being small and narrow.

We now have all the names:

1. *Procellaria fregata* Linné, perhaps indeterminable.
2. *Fregetta tropica* (Gould).
   - (a) *F. t. tropica* (Gould), Atlantic Ocean.
   - (b) *F. t. melanogaster* Gould (*tubulata* Mathews a synonym), Indian Ocean and South Polar regions.
   - (c) *F. t. australis* Mathews, Pacific Ocean.
3. *Fregetta leucogaster* (Gould).
   - (a) *F. l. leucogaster* (Gould), Indian Ocean.
   - (b) *F. l. deceptis* Mathews, Pacific Ocean.
4. *Fregettornis grallaria* (Vieillot).
   - (a) *F. g. grallaria* (Vieillot), off Chilean coast.
   - (b) *F. g. titan* Murphy, Rapa Island.
   - (c) *F. g. innominatus* Mathews (*insularis* a synonym), Lord Howe Island.
   - (d) *F. g. tristanensis* Mathews, Tristan da Cunha.
5. *Fregettornis melanoleuca* Salvadori, type in existence, no other specimen known, locality doubtful.
6. *Fregettornis royana* Mathews, Lord Howe Island.
7. *Fregettornis guttata* Mathews, Marquesas Island.
8. *Pealea lineata* (Peale), Samoa.
9. *Pealeornis maoriana* Mathews, New Zealand.

I wish to thank the following, who have helped me with the loan of specimens and thus enabled me to examine all the available skins in the world of the birds in these genera:

The officials of the Bird Room in the Natural History Museum, at South Kensington, especially Dr. P. Lowe and Mr. N. B. Kinnear.

Lord Rothschild, the Museum, Tring.

Dr. J. Berlioz, Museum National d'Histoire Naturelle, Paris, and Mr. L. Delapchier, for drawing the foot of the type of *grallaria* Vieillot and *P. maoriana*.

Mr. Harry Swarth, the Academy of Natural Sciences, California.

Drs. R. C. Murphy and L. Sanford, the American Museum of Natural History, New York.

Mr. D. J. Mahony, Director of the National Museum, Melbourne.

Dr. Roberto Dabbene, Director of the Museo Nacional de Historia Natural, Buenos Aires.

Mr. Percy H. Grimshaw, Keeper, Natural History Department, of the Royal Scottish Museum, Edinburgh.

Professor Arcangeli, Director of the Istituto e Museo di Zoologia, Torino, Italy, and Dr. Festa of the same institution.

Dr. E. Stresemann, Zoologisches Museum der Universitat, Berlin.

Dr. A. Wetmore, National Museum, Washington, D.C.; and Mrs. A. M. Awl of the same institution, for drawing the foot of the type of *lineata* Peale. Mr. J. H. Riley, of the same institution, who measured *Pealea*.

Dr. E. G. Gill, Director of the South African Museum, at Cape Town.

The Trustees of the Australian Museum, Sydney, New South Wales.

The Trustees of the Mackay Museum, Sydney, New South Wales.

Dr. Professor Einar Lönnberg, Stockholm.

I have examined for this monograph over 240 specimens.

SIPHONAPTERA COLLECTED BY MR. F. SHAW MAYER IN MANDATED NEW GUINEA.

By DR. KARL JORDAN, F.R.S.

(With 8 text-figures.)

THE collection of Siphonaptera made by Mr. F. Shaw Mayer during his 1932 expedition in Mandated New Guinea is the largest ever recorded from New Guinea. The specimens were obtained from February to December in the Krätke Mts., Buntibasa district, at altitudes varying from 4,000 to 5,000 ft.; the cat-flea was found in numbers on a Mission dog. Altogether 10 species were procured, of which 4 are new, one of them representing a new genus; moreover, the undescribed male of another species was obtained in numbers, and a second specimen of *Stivalius abacetus*, the type of which had remained unique in our collection.

As the collector of mammals in New Guinea has to depend to a very great extent on the help of natives, and as the fleas soon leave a live or dead host if handled too much, we greatly appreciate the success Mr. F. Shaw Mayer has had in spite of such adverse circumstances.

1. **Pulex irritans** L. 1758.

In camp, a small number of both sexes. Presumably an introduction by the white man.

Alaopsylla gen. nov.

♂. Close to *Xenopsylla cheopis* Roths. 1903, but eye absent, being represented only by an internal brown spot.

The genus stands in the same relation to the *cheopis*-subgroup of *Xenopsylla* Glink. 1907 as *Rooseveltiella* Fox 1914 to the *brasiliensis*-subgroup of that genus.

One species.

2. **Alaopsylla papuensis** sp. nov. (text-figs. 3, 4).

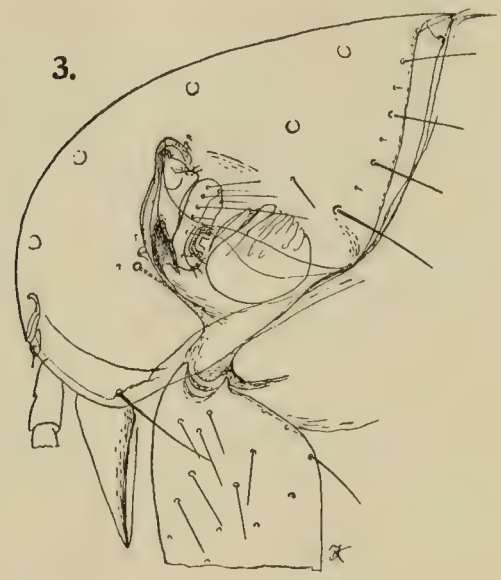
♀. Bristles of head and body nearly all shorter and thinner than in *X. cheopis*, fewer on coxae and femora, proboscis shorter, midtarsal segment II shorter, etc.

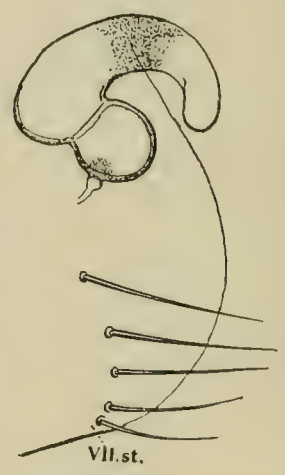
On frons a bristle before vestige of eye and another near ventral margin. On occiput a minute bristle at base of antennal groove, a small one in middle and a subapical row of 5 each side, all much smaller than in *X. cheopis*. Proboscis reaching to four-fifths of forecoxa.

The row of bristles contains 14 on pronotum, 13 on mesonotum and 12 on metonotum; mesopleurae with 5 bristles placed as in *X. cheopis*; on metepimerum a row of 5 from stigma downwards and in front of the lower end of the row 1 or 2 bristles.

On abdominal tergites (the two sides together) a row of 14 or 15 bristles on II to VI., and 12 on VII. On sternites III to VII 9 or 10 bristles.

Forecoxa with 22 to 25 bristles on outer surface. On inner side of hindcoxa 3 small spiniforms, on one coxa 4. On hindfemur 2 subventral subapical bristles on outside and from 2 to 4 on inside ; the ventral tooth, so strongly developed as a rule in *X. cheopis*, is vestigial. Midtibia with 5 dorsal notches, bearing strong bristles (inclusive of apical notch), above and below postmedian pair a strong bristle each, at apex dorsally 3 strong bristles and a small one ; on outer surface 4 or 5 subdorsal bristles. Hindtibia with 6 dorsal notches, apical notch with 3 heavy bristles, subapical one with 1 or 2 bristles, between this and the postmedian pair another stout bristle ; 5 or 6 lateral subdorsal bristles inclusive of





apical one ; longest apical bristle of hindtarsal segment II reaching to or a little beyond IV. Measurements of foretarsus : 7, 7, 6, 4·5, 11, midtarsus 11, 12, 8, 5·5, 12, hindtarsus 31, 18, 11, 6·5, 14.

Modified segments.——On each side of VIII. t. one large bristle at some distance below stigma, with or without a small bristle farther up, 4 lateral bristles farther down, and a ventral-apical row of 10 to 12, at apical margin on inside a row of 9 or 10, these short with the exception of the bristle at the ventral apical angle. Stylet not quite twice as long as broad (13 : 7). Bursa copulatrix almost as in *X. cheopis* ; head of spermatheca a little smaller and rounder than in *X. cheopis* and the base of the tail more ventricose.

Length : 2·1 mm., hindfemur : 0·45 mm.

On *Pogonomys loriae* Thomat, No. 353, 2 ♀♀.

3. **Ctenocephalides felis felis** Bouché 1835.

A large series from a Mission dog at Kambaidam, 4,000 ft. Introduced ; the native race would be *Ct. felis orientis* Jord. 1925, which was not obtained, but which we have from Rook, Dampier, Admiralty and the islands in Geelvink Bay.

4. **Acanthopsylla enderleini** Wagner 1933.

♀. *Akmepsylla enderleini* Wagner, *Mitteil. Zool. Mus. Berlin*, xviii. p. 354. text-figs. 14, 15, 16 (1933) (Mandated N. Guinea, on *Pseudochirops albertisii*).
Acanthopsylla enderleini id., *l.c.* p. 362 (1933) (correction).

Evidently represents *A. gravida* Roths. 1916 in New Guinea. The ♂ differs slightly in the process of the clasper being subapically somewhat more distinctly concave on the posterior side, the apex of the ventral arm of IX. st. narrower, with the proximal bristle on the widened apex larger, the small ventral bristles on the inner surface of VIII. st. more numerous, forming an irregular row from the base of the ventral apical lobe forward, the lateral bristle of X. t. thinner, and the anal pleurites (a distinct sclerite in this genus) with 4 lateral bristles instead of 5. In all the ♀♀ the lobe above the sinus of VII. st. is broader than in *A. pavida*, as pointed out by Wagner, but varies in width; head of spermatheca somewhat shorter.

On *Dactylopsila*, a series; *Distoechurus*, 3 ♀♀; *Phascogale*, 1 ♂. The first mammal is evidently the true host.

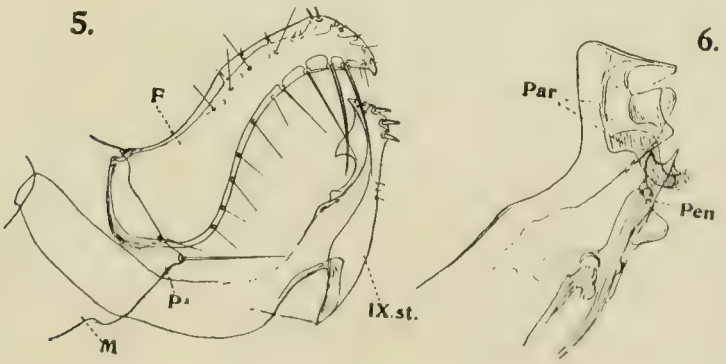
5. **Stivalius mordax** J. & R. 1922.

On *Rattus browni* Alst., No. 302, 7 ♂♂, and *Dasyurus*, 1 ♂.

6. **Stivalius shawmayeri** sp. nov. (text-figs. 5, 6, 7).

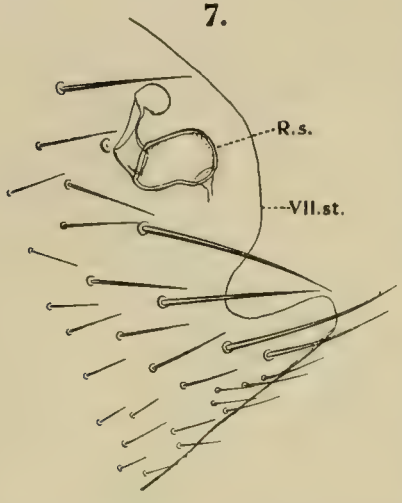
♂♀. Near *St. mordax*; frons less strongly curved, but with some strong bristles; eye somewhat larger, as is also the stigma-cavity of VIII. t.; basal abdominal sternite without lateral bristles, but with some minute pale dots, the sockets of minute hairs.

♂. Apical margin of VIII. st. more distinctly incurved, the ventral angle



therefore less broadly rounded, the most distal ventral bristles smaller. Exopodite F less curved, without a ventral proximal patch of small hairs; three long ventral subapical bristles, which are thinner than in *St. mordax* and stand farther away from the hooked apex, the third thinner than the other two; from this bristle to basal curve of ventral margin a row of about 7 thin short bristles; two short pale dorsal spiniforms close to the highest point. Process P² of clasper short, above it a small bristle. Ventral arm of IX. st. curved upwards at tip and

narrowed into a sharp beak, bearing a few minute bristles, proximally of them 3 short ventral spiniforms placed at nearly equal distances from one another on the convex apical portion of the sclerite; dorsally the apical two-fifths of IX. st. compressed, a smooth ridge being formed as in several other species, this ridge widened into a triangular tooth, which is sharp and somewhat curved frontad, on the frontal side of the tooth a rounded sinus, which gradually becomes shallow anteriorly; the ridge forming anteriorly a small hump. The armature of the penis is much obscured in the specimen, the figure (text-fig. 6) therefore is probably incorrect in several points, dorsal hood of paramere, however, plainly visible, rounded dorsally and truncate apically, being quite different from the evenly curved hood of *St. mordax*.



♀. The lobe of the sinus of VII. st. very broad and almost evenly rounded; the pair of long bristles placed on the lower lobe much more proximal than in *St. mordax*, the upper one of the two farther frontal than the deepest point of the sinus, and the other nearly on a level with that point. Head of spermatheca (R.s) slightly wider near apex than near tail, one-half longer than broad.

Length: ♂ 2·0 mm., ♀ 2·2 mm.; hindfemur: ♂ 0·36 mm., ♀ 0·40 mm.

On *Dorcopsis*, 1 ♂, type; *Peroryctes*, 1 ♀.

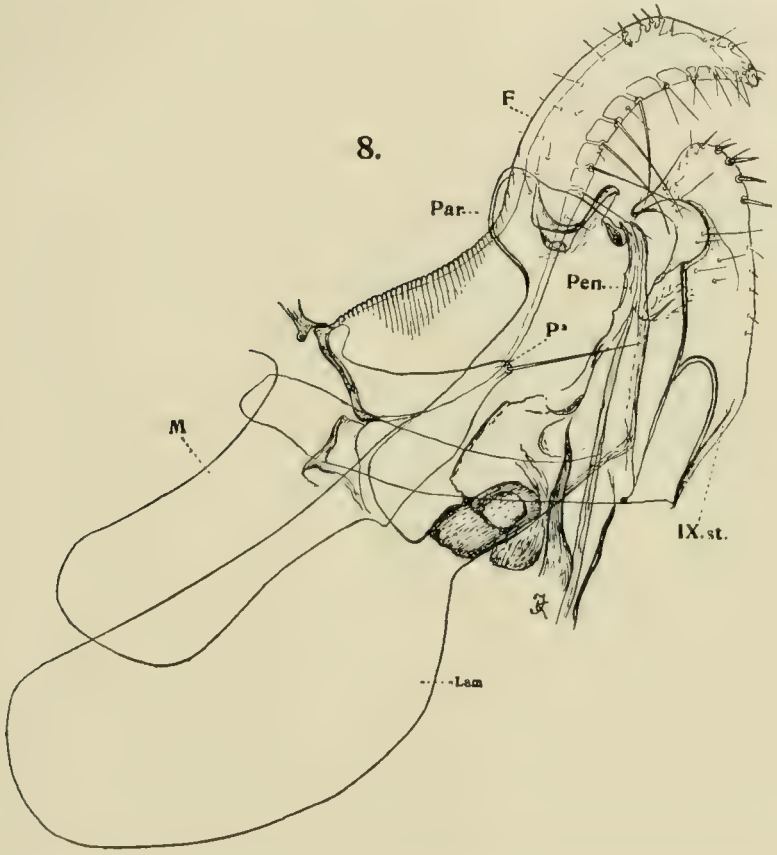
7. **Stivalius corrugis** sp. nov. (text-fig. 8).

♂. Near *St. papuanus* J. & R. 1922 (British N. Guinea), of which the ♀ only is known. At first sight one might take it for the ♂ of that species, but there are two points in its morphology which speak against that association. In the ♂♂ of *Stivalius* the dorsal median projection of tergite VII in between the two sets of antepygidial bristles is shorter than, or at most as long as, in the ♀♀; in *St. corrugis* the process is longer than in the ♀ *St. papuanus*; further, the stigma-cavity of tergite VIII, which is very large in the ♀ *St. papuanus*, is not large enough in the ♂♂ here described for them to be that sex of *St. papuanus*. For these two reasons I regard these ♂♂ as representing another species. They differ very much in the genitalia from all the other known *Stivalius*. The chaetotaxy is similar to that of the ♂ of *St. novaeguineae*, the number of bristles on the thorax and abdomen being smaller than in *St. papuanus*, as is generally the case in ♂♂ as compared with ♀♀. The pronotum being shorter than in *St. papuanus* and the spines of the comb longer in comparison with the pronotum is explained by the specimens being ♂♂; the spines of the comb somewhat bluntly pointed.

Metepimerum with 11 or 12 bristles. The number of small bristles on the abdominal segments variable; on tergites II 23–27, 14, III 25–30, 15 or 16, IV 27–31, 16, V 24–30, 15 or 16, VI 24–27, 16, VII 23, 13 or 14; on sternites III 12–18, 8, IV 14–22, 8, V 14–19 (?), 8, VI 16–24, 8, VII 22–28, 8 (each side one

bristle of the posterior row small, 3 large). On VIII. st. each side about 45 to 55 bristles.

Manubrium (M) of clasper and the lamina (Lam) of penis very broad, apically broadly rounded and without a dorso-apical projection (M more evenly rounded at apex in the second specimen than in type). Ventral process P^2 of clasper conical. Exopodite F dorsally corrugated transversely in basal third, apex gradually and very moderately curved down, less strongly convex dorsally at the highest point



than is usual, long bristles of ventral margin slender, pale, far removed from apex ; 3 or 4 small dorsal spiniforms. Ventral arm of IX. st. broad, apex rounded, with 4 or 5 small spiniforms along the ventral margin at nearly equal distances from each other, the distance from the first (most proximal) to the last about the same as the distance from the first to the dorsal margin of the dorsal sinus. Dorsally IX. st. produced into a rather high cone, almost pointed, beak-like, proximally of this cone a rounded sinus. Paramere (Par) rounded dorsally, truncate apically ; in this hood a narrow sclerite curved distad at both ends, the ventral end projecting, somewhat resembling the head and neck of a snake.

Length : 2·9–3·0 mm., hindfemur 0·43–0·47 mm.

On *Peroryctes*, 2 ♂♂.

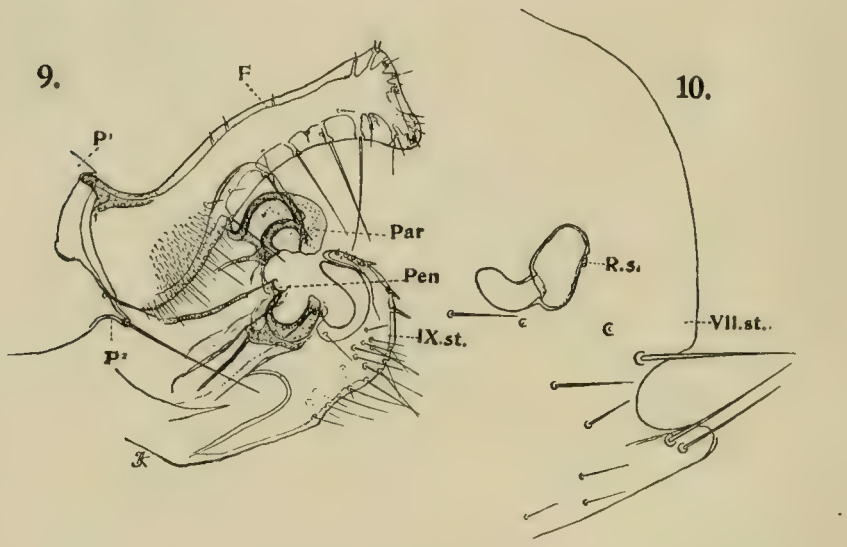
8. **Stivalius novaeguineae** Roths. 1904.

On *Peroryctes*, 2 ♀♀, one of them the largest of our series (hindfemur 0·61 mm.) *Dasyurus*, 1 ♀.——Mr. F. Shaw Mayer also obtained a ♀ in Dutch New Guinea : Weyland Mts., on *Phascogale*.

9. **Stivalius gracilentus** sp. nov. (text-figs. 9, 10).

♂♀. Close to *St. novaeguineae* and occurring on the same host. Paler and much smaller, the genitalia of the ♂ different and the ♀ with fewer bristles. Spines of pronotal comb very sharp, as in *St. novaeguineae*.

♂. Ventral angle of clasper produced into an almost cylindrical process (P^2) bearing a long bristle, longer than the corresponding projection of the clasper of



St. novaeguineae. Exopodite F much less curved than in that species, its apex narrower, with both the upper and the lower angle rounded off, there being no " nose " ; three long bristles at ventral margin, much thinner than in *St. novaeguineae* and farther away from apex, the most distal one about as far distant from apical margin as from dorsal margin, whereas in *St. novaeguineae* the bristles are close to apex ; the row of 3 continued basad by 2 or 3 long thin bristles, upon which follows towards base a dense row of short ones ; from this row dorsad on the inner surface a patch of numerous small bristles which extends about halfway to dorsal margin ; dorsal apical angle with 2 minute spiniforms. The IX. st. differs especially in its apical half : apical third curved upwards, from the beginning of this curved portion to near basal third about 15 bristles forming a ventral row widened distally into a patch on the outer surface ; curved apex with 3 small pale spiniforms as shown in the figure ; the apex divided into a ventral lobe bearing some minute hairs and a dorsal smooth cone ; corresponding to the curve of the apex of the segment there is a dorsal rounded sinus, proximally to which the segment is wide to base, at the angle of this broad portion a few minute hairs and below these a thin bristle.

♀. The specimen which I regard to be the ♀ of *St. gracilior* on account of its small size agrees closely with the ♀ of *St. novaeguineae* except in the number of bristles on the metepimerum (9) and abdominal segments (the two sides together): on tergite II 18, 14, III 19, 16, IV 17, 16, V 13, 16, VI 13, 14, VII 12, 8 (inclusive of the bristle below the antepygidial pair); on sternite III, 10, 10, IV, 9, 8, V 7, 8, VI, 8, 8, VII 13, 10; on tergite VIII (each side) 4 bristles above stigma, 10 ventrally and apically, and 3 on inside, of which the lowest is thin, long, ventro-apical, the 2 upper inner bristles not both above the upper apical outer bristle, as in *St. novaeguineae*, but the second below that outer bristle. Shape of VII. st. and spermatheca (text-fig. 10) do not present any appreciable differences, both being slightly variable in *St. novaeguineae*.

Length: ♂ 2·7 mm., ♀ 2·9 mm.; hindfemur ♂♀ 0·40 mm.

On *Peroryctes*, one pair.

10. **Stivalius abacetus** J. & R. 1922.

On *Dasyurus*, 1 ♀.——This is the second ♀ we have received; the ♂ is still unknown. As in *St. novaeguineae* and the above described *St. gracilentus*, the labial palpus has six segments, in all the other species five.

RECORDS OF SIPHONAPTERA FROM THE STATE OF NEW YORK.

By DR. KARL JORDAN, F.R.S.

(With 2 text-figures.)

APART from some species obtained near Ithaca, we have hardly any records of Siphonaptera from the north-western counties of New York south of Lake Ontario. The 9 species here enumerated, one of them new to science, were collected by Professor S. C. Bishop, some pupils of the professor, and by Mr. R. Hart, and were submitted to me by Professor Bishop, to whom I express here my best thanks. The new species belongs to the genus *Atyphloceras*, which was known only from California and Arizona; its discovery in the State of New York, therefore, is of some interest.

1. **Ceratophyllus leucopus** Baker 1904.

Mendon Ponds, Monroe Co., on *Peromyscus leucopus noveboracensis*, 16.x. and 1.xi.1929 (R. Hart), 3 ♂♂, 5 ♀♀; Fairport (east of Rochester), same host, 10.x.1929 (R. Hart), 1 ♂.

2. **Ceratophyllus arctomys** Baker 1904.

Prondequoit Bay, Monroe Co., on *Marmota monax rufescens*, iii.1929 (Wm. Kruse), 1 ♂; Parma, Monroe Co., same host, iv.1929 (E. F. Lolonde), 3 ♂♂, 4 ♀♀.

3. **Ceratophyllus asio** Baker 1904.

Mendon Ponds, Monroe Co., on *Microtus pennsylvanicus pennsylvanicus*, 16.x.1929 (R. Hart & S. C. Bishop), 2 ♀♀.——Only a few specimens of this species are known.

4. **Leptopsylla hesperomys** Baker 1904.

Mendon Ponds, Monroe Co., on *Peromyscus leucopus novcboracensis*, 1.ix.1929 (R. Hart), 1 ♂, 2 ♀♀.

5. **Ctenophthalmus pseudagyrtes** Baker 1904.

Fairport, on *Condylura cristata*, 21.vi.1929, 1 ♂, 3 ♀♀, and on *Blarina brevicauda talpoides*, 10.x.1929, 1 ♂, 1 ♀ (R. Hart); Woodville, Canandaigua Lake, same host, 3.i.1930 (R. Hart & S. C. Bishop), 3 ♂♂, 4 ♀♀; Charlotte (north of Rochester), on *Parascalops breweri*, 2.vii.1929 (Jas. Feely), 1 ♂, 6 ♀♀.

6. **Neopsylla wenmanni** Roths. 1904.

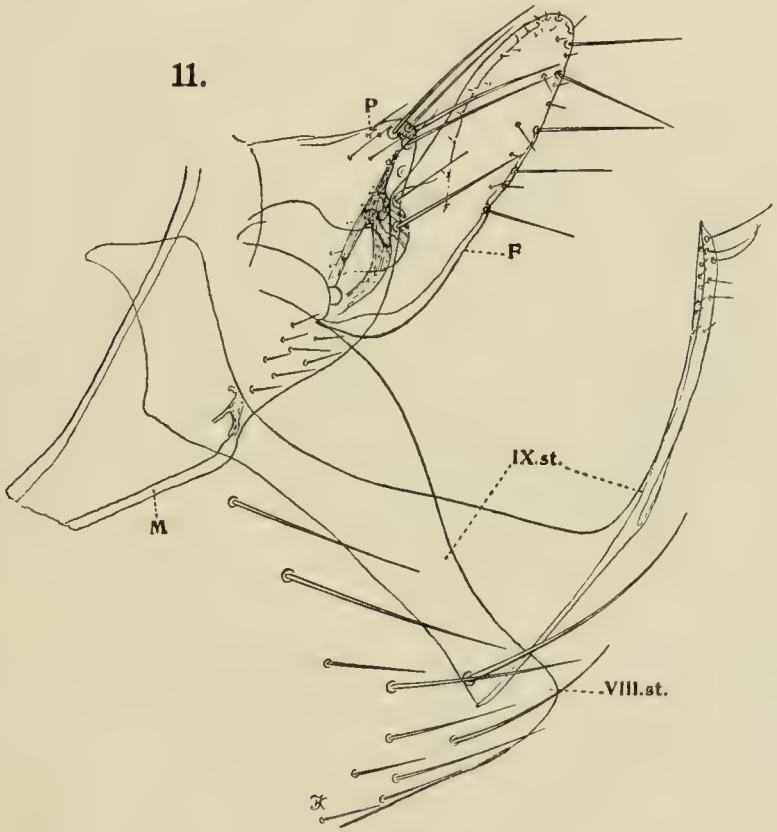
Mendon Ponds, Monroe Co., on *Peromyscus l. noveboracensis*, 16.x.1929, 21 ♂♂, 16 ♀♀, and on *Blarina br. talpoides*, 26.x.1929, 1 ♀; Woodville, Canandaigua Lake, on *Bl. br. talpoides*, 31.i.1930, 2 ♂♂; all collected by R. Hart & S. C. Bishop.

7. **Doratopsylla blarinae** Fox 1914.

Mendon Ponds, Monroe Co., on *Bl. br. talpoides*, 16.x.1929 (R. Hart & S. C. Bishop), 1 ♀; Fairport, same host, 10.x.1929 (R. Hart), 2 ♂♂.

8. **Atyphloceras bishopi** spec. nov. (text-figs. 11, 12).

♂♀. Distinguished from *A. multidentatus* Fox 1909 (S. Francisco) and *A. echis* J. & R. 1915 (Arizona) especially by the tubercle of the frons being more distant



from the anterior oral angle, by the labial palpus consisting of 5 segments instead of 6 or more, and by the posterior abdominal segments.

Distance of frontal tubercle from anterior oral angle twice as long as in the other known species of the genus, being more than one-third as long as the distance of the anterior oral angle from the nearest point of anterior margin of antennal groove (9 : 22 ; in the other species 4·5 : 22). The second of the 4 rows of bristles of the occiput represented by only 1 or 2 bristles. Proboscis reaching to apex of forecoxa, not beyond.

Pronotal comb with 22 spines, the dorso-lateral spines one-eighth shorter than pronotum. Apical marginal area of metanotum about one-fourth the

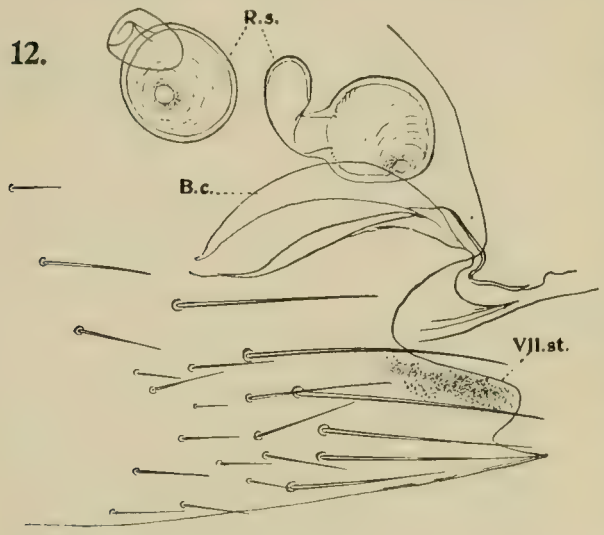
total length of the metanotum (in the allied species about one-seventh). On metepimerum 6 or 7 bristles in ♂ (1 or 2, 2, 3), 9 in ♀ (1, 5, 3).

Three rows of bristles on abdominal tergites, and a few additional dorsal bristles in front of the rows ; number of apical spines (on the two sides together) in ♂ 8, 12, 9, 7, 6, 2, in ♀ 8, 13, 8, 8, 5, 2. Three antepygidial bristles, the upper one in ♀ less than one-half the middle one, the lower bristle nearly two-thirds, in ♂ the upper less than one-third and the lower less than one-half the middle bristle. Bristles on sternites : ♂ III 2, 4, IV to VI 4, 4, VII 6, 7, in ♀ III 4, 6, IV 7, 6, V 9, 7, VI 9, 8, VII 27, 12.

Legs as in the other species of the genus.

Modified Segments.——♂. VIII. (text-fig. 11) st. large on each side, with 9 or 10 bristles, of which the most distal subventral one is much the longest ; apical margin somewhat incurved, but this sinus quite shallow, and the margin rounded above and below it. Process P of clasper conical, with 5 or 6 bristles at apex and posterior margin, and 5 or 6 small ones laterally and dorsally, on inner side of apex a stronger bristle. General shape of the movable sclerite F (=lower pleurite, or episternum of segment IX) as in *A. multidentatus*, but broader, the angle of the anterior margin nearer to the lowest point of the margin, and the ventral margin of F incurved, the sclerite therefore ventrally angulate. Vertical arm of IX. st. with the upper anterior angle produced as a nose, ventrally the vertical arm gradually and strongly widened ; horizontal arm narrow, pointed, very slightly widened close to apex (strongly widened, triangular, in *A. multidentatus*), with 3 longish bristles near apex, 2 shorter ones farther forward, and a dorsal row of about 6 short ones.

12.



♀. VII. st. with a rounded sinus which is not quite so deep as its distance from the nearest bristle of the posterior row, upper lobe shorter than lower, obtuse ; its upper margin strongly slanting ; lower lobe more strongly chitinised ; truncate, with the apex excised, rounded above the excision, somewhat more projecting below the excision and (in lateral aspect) pointed. On VIII. t. about 10 bristles above stigma (each side), 2 or 4 below it, of which 1 or 2 are long, 20 on widened portion on outside and 9 or 10 short ones on inside. Stylet very little more than twice as long as broad. Bursa copulatrix three times as long as broad, curved ; spermatheca (2) with globular head which is less rounded ventrally than dorsally and is larger than in *A. multidentatus* and *A. echis* ; tail as in *A. multidentatus*, smaller than in *A. echis*.

Length: ♂ 2·4 mm., ♀ 3·3 mm.; hindfemur: ♂ 0·48 mm., ♀ 0·53 mm. New York: Fairport, 10.x.1929, on *Blarina brevicauda talpoides* (R. Hart), 1 ♂, type; Mendon Ponds, Monroe Co., 16.x.1929, on *Microtus penns. pennsylvanicus* (S. C. Bishop & R. Hart), 1 ♀.

9. **Hystrichopsylla gigas tahavuana** Jordan 1929.

Mendon Ponds, Monroe Co., 1.xi.1929, on *Peromyscus leucopus noveboracensis* (R. Hart), 1 ♀.

DESCRIPTIONS OF SIPHONAPTERA.

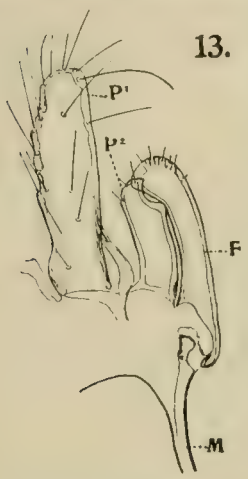
By DR. KARL JORDAN, F.R.S.

(With 7 text-figures.)

1. **Echidnophage perilis** Jord. 1925 (text-fig. 13).

DESCRIBED from West Australian ♀♀, no ♂♂ being available at that time. Dr. L. Glanert has lately sent a number of specimens among which are some ♂♂. In the original diagnosis (NOV. ZOOL. xxxii. p. 97 (1925)) I said that segment V of the hindtarsus was at least as long as segments I to IV together; it should read foretarsus instead of hindtarsus. In the ♂ this segment of all tarsi is as long as in the ♀, with equally large plantar bristles, and there are, as in the ♀, two subapical ventral bristles on this segment. The upper process P^1 of the genitalia (text-fig. 13) is rather stout and straight, being less than four times as long as broad; process P^2 is sharply excised ventrally at the apex, the excision being rounded and the apical angle of P^2 somewhat acute, the third process F, corresponding to the movable process (= meral pleura) of the majority of fleas, is characterised by being as long as P^1 (measured on the ventral side) and by being apically somewhat widened and curved towards P^2.

13.



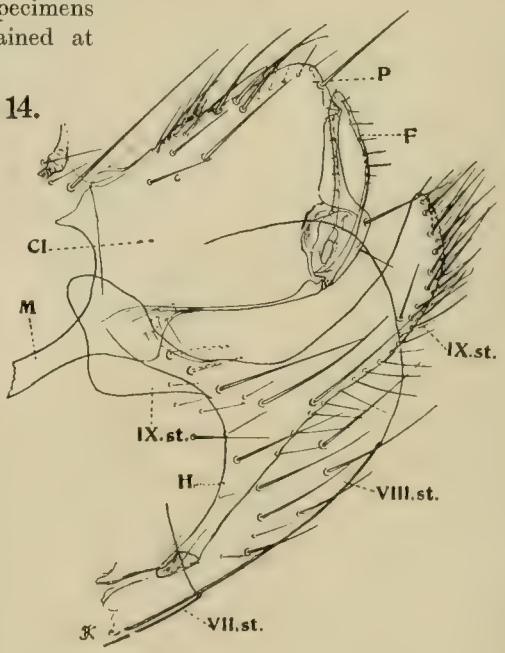
The specimens were obtained at Perth, W. Australia, on *Peragale lagotis*.

2. **Rhopalopsyllus tripus** sp. nov. (text-figs. 14, 15).

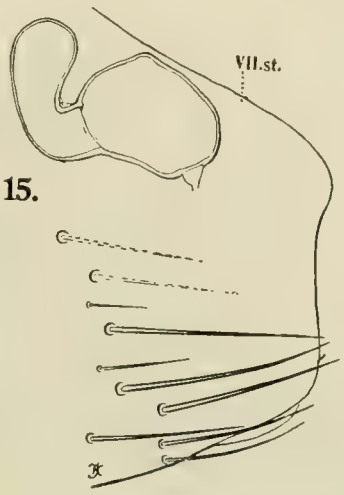
♂♀. In chaetotaxy agreeing with *Rh. acodontis* J. & R. 1923, *Rh. byturus* J. & R. 1923 and *Rh. dunni* J. & R. 1922 (see *Ectoparasites*, I. pp. 336–338 (1923)).

♂. On VIII. t. below stigma one long bristle and a short one. VIII. st. strongly rounded, ventrally divided to near the posterior bristles, but not quite so deeply as in *Rh. byturus*, with about 20 bristles on each side, inclusive of the small ones. Clasper and exopodite F as in

14.



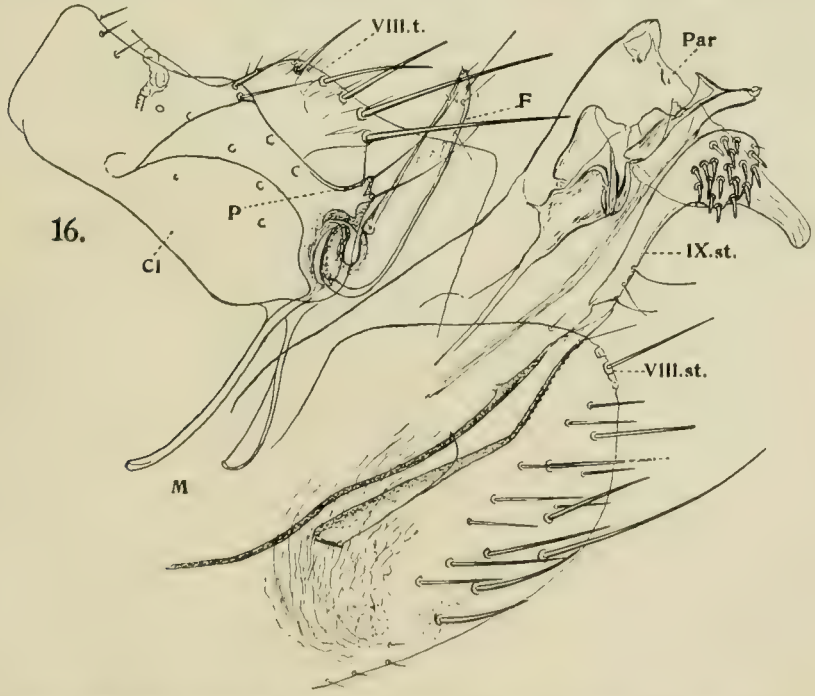
Rh. byturus, but IX. st. different: ventral arm broader, ventrally beyond middle strongly convex, the frontad projection (the heel, H) longer and narrower than in any other known species, the distance from the tip of H to the nearest point of the dorsal curve of the ventral arm only a little over one-fifth shorter than the distance from the apex of the ventral arm to the nearest point of the posterior bay above the heel; bristles near apex of ventral arm much less prolonged than in *Rh. byturus* and *Rh. acodontis* (very long in *Rh. dunni*).



15.

♀. The specimen of this sex which was obtained together with the ♂♂ agrees in the outline of VII. st. with *Rh. acodontis*. As we do not yet know any reliable distinctions between the ♀♀ of *Rh. byturus*, *Rh. acodontis*, *Rh. axius*, and some others (see *Ectoparasites*, I. p. 351, 1923)), we may regard the ♀ here figured (text-fig. 15) as being the true ♀ of *Rh. tripus*.

Argentina: Rosario de Lerma, on *Cavia leucoblephara*, 10. x. 1928 (Dr. L. Uriarte), 2 ♂♂, 1 ♀.—The shape of IX. st., with two vertical arms (one each side) and three ventral processes (the heel

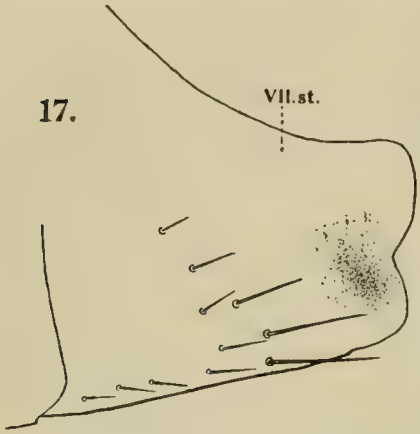


16.

and the two ventral arms) recalls the chair of the Pythia of Delphi; hence the specific name *tripus*, a Latin noun denoting that chair.

CORRECTION.—In the key given on pp. 350–351 of *Ectoparasites* some misprints occur which have not yet been corrected ; on p. 350 at end of line 3 from bottom read l instead of m ; on p. 351, at end of line 6 from top read o instead of p. The *Rh. bohlsi* of that paper is *Rh. rimatus* Jord. 1932, and the *Rh. bernhardi* is *Rh. bohlsi* Wagner 1901 ; see NOV. ZOOL. xxxviii. p. 292, no. 6 (1932).

17.

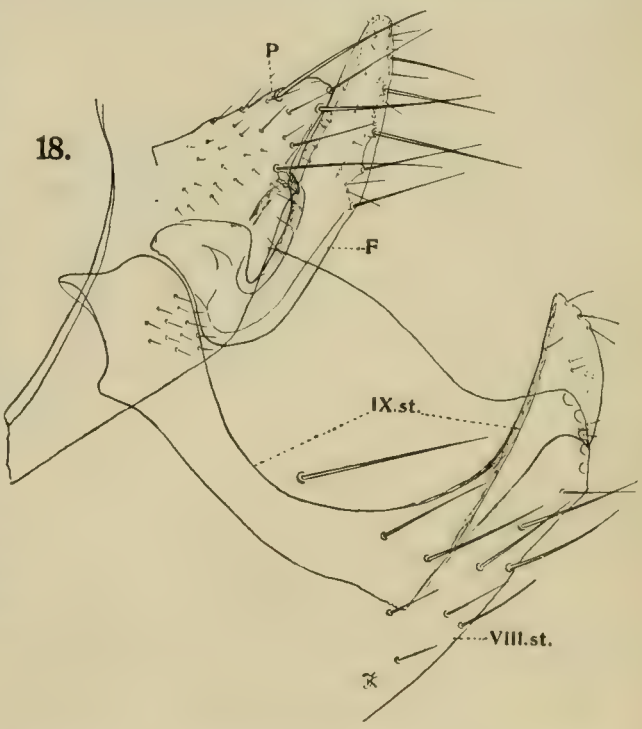


3. **Xiphiopsylla lippa** sp. nov.
(text-figs. 16, 17).

♂♀. Near *X. hippia* J. & R. 1913 ; the surface structure much less prominent, the abdominal tergites less strongly chitinised dorsally and ventrally, especially in ♀, the short bristles of the tergites thinner.

♂. Bristles of VIII. t. thinner, the two lower distal ones longer ; the ventral apical angle of VIII. t. about 90°, rounded off or sharp, but not produced backwards. Process P of clasper much more distinctly projecting. Movable finger F less curved. Apex of IX. st. with fewer spiniforms.—♀. VII. st. with lateral sinus, proximally to which the chitin thickened, the incrassation appearing as a darker lateral patch ; in *X. hippia* and *X. apriona* J. & R. 1913 the incrassation is ventral (♀ of *X. hyparetes* J. & R. 1913 not known). The receptaculum seminis of all three specimens lost in mounting.

18.

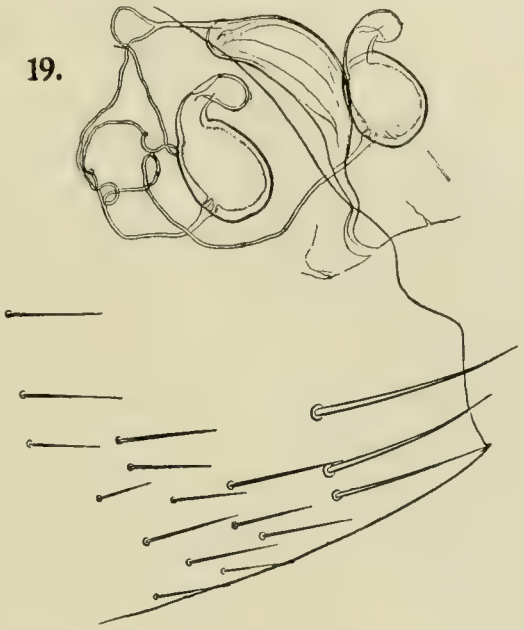


Length : ♂ 2·1–2·5 mm., ♀ (extended) 2·8–2·9 mm. ; hindfemur ♂♀ 0·35–0·40 mm. Kenya Colony : Nakuru, on *Lophuromys aquilus*, x. 1928 (from Medical Research Laboratory, Nairobi) ; 3 ♂♂, 3 ♀♀.

4. **Atyphoceras felix** sp. nov. (text-fig. 18).

♂. Near *A. multidentatus* Fox 1909 ; as in that species the angle of frons near oral angle, the apical area of metatergite short, and the proboscis with more than 5 segments (7 in the new species) ; but differs in the tail-end.

VIII. st. much less deeply sinuate than in *A. multidentatus*, the margin hardly at all projecting above the sinus, the lobe below the sinus with 5 marginal bristles, the sternite bearing on one side 18 bristles altogether and on the other 19. Process P of clasper much longer than in *A. multidentatus*, with about 10 bristles, 4 of them long or longish, the others shorter; its anterior margin with a strongly projecting nose in middle. Movable sclerite F longer and narrower than in *A. multidentatus*, the ventral end less rounded and the angle of the anterior margin at three-eighths, instead of at two-eighths. Apex of vertical arm of IX. st. broader than in *A. multidentatus*, and the triangular apical dilated portion of the ventral arm longer.



Length : ♂ 2·3 mm.

California : Cuddy valley, Ventura Co., 5,000 ft., on *Peromyscus truei*, 20.v.1922 (A. B. Howell), 1 ♂.

5. **Atyphoceras artius** sp. nov. (text-fig. 19).

♀. Close to *A. multidentatus*, but the bursa copulatrix of the same long shape as in *A. echis* J. & R. 1915.

One labial palpus with 7 segments, the other with 8. Hindfemur with 5 subventral bristles posteriorly on outside, and hindtibia with more than 20 lateral bristles, apart from the ventral and subventral ones. Ventral lobe of VII. st. truncate-emarginate as in *A. multidentatus*, but there are more bristles on this sternite, on the two sides together 35, of which the 6 posterior ones long. On VIII. t. (each side) 6 bristles above stigma, 7 below it, of which 1 very long, on widened area 19, of which 5 are long, and on inside 8. Stylet nearly three times as long as broad. Bursa copulatrix (text-fig. 19) somewhat shaped like a pea-pod, about three times as long as broad ; spermatheca nearly as in *A. multidentatus*, smaller than in *A. echis*, its head somewhat pear-shaped, i.e. longer than broad and distinctly narrowed towards tail, which is smaller than in *A. echis*.

Length : ♀ 2·7 mm.

British Columbia : Kelowna, on *Peromyscus*, 4. x. 1908 (A. Tate), 1♀.

A SURVEY OF THE CLASSIFICATION OF THE AMERICAN SPECIES OF *CERATOPHYLLUS s. lat.*

BY DR. KARL JORDAN, F.R.S.

MORE than twenty years ago we divided the numerous species placed into *Ceratophyllus* Curtis 1832 into groups which rendered it comparatively easy for us to find the right place for a new species. This classification was not published, for several reasons. A breaking up of the genus into its component parts would necessitate the separation of *Ceratophyllus fasciatus* Bosc 1801 and its numerous allies under a new generic name, and one of us was very reluctant to take the responsibility for such a change, because the name *Ceratophyllus fasciatus* had already become so very familiar to the students of Hygiene and Tropical Medicine that a change would be felt as an inconvenience. We further considered it advisable to await the discovery of more species before a detailed classification should be attempted, and, moreover, we hoped that the needs of Systematic and Applied Biology might be satisfied by dividing the large assemblage of species of *Ceratophyllus* into groups and calling each group by the name of one of the familiar contained species, such as *wickhami*-group, *fasciatus*-group, *hirundinis*-group, etc., without giving a generic name to each of the groups of species. This method of dealing with a genus which has become cumbersome has its great advantages, and the writer of this article is quite satisfied with it in the case of the genus *Papilio* with its many hundreds of species. It has the great advantage (1) that one knows at once what kind of species a new one is if the species is stated to belong to a certain group, (2) that the number of generic names is restricted, and (3) that a change in familiar valid names is avoided and therefore the continuity of the names in scientific literature ensured. But—the tendency is all the other way. The splitting-up of *Ceratophyllus* has begun, and there is no means of stopping the process of dissolution from going on. Human nomenclature sits on the neck of divine nature, and, there being an emotional force behind it, has assumed an astounding importance, like the emotional political forces under which humanity suffers. If I here inflict on science a number of new generic names, I plead the excuse that the divisions of *Ceratophyllus* I here define would inevitably be named by somebody else, probably by someone who does not know these fleas, as has happened in other orders of animals.

The genus *Ceratophyllus* as formerly conceived consists of two branches which are not very closely related to each other. It is the merit of Dr. Julius Wagner to have recognised this divergency.

I. Upper eye-bristle at or near margin of antennal groove, above level of eye. On inside of genal area a rod-like sclerite, joined with its anterior end to head-capsule behind median eye-bristle, curved up- and backwards, covered by eye, reappearing behind eye as a thin cord which ends at posterior margin of head behind apex of genal lobe.——This combination of characters is found in many genera of *Siphonaptera*, but the *Ceratophyllinae* which have it are mostly Palaearctic-Asiatic, there being among the known American fleas only one such species which comes within the scope of this paper. This species is *Ceratophyllus*

terribilis Roths., which belongs to *Ctenophyllus* Wagn. 1927. A further development of this group is represented by *Odontopsyllus* Baker 1905, in which the hairs on the inner side of the hindcoxa are shortened and partly spiniform.

II. Upper eye-bristle on a level with middle of eye (except if eye is vestigial). No internal sclarified genal cord.——Here belong most species of *Ceratophyllus* in the old sense, among them over eighty American ones. These fleas fall into three groups according to the bristles on the forefemur and on the mid- and hindcoxae. These bristles indicate certain lines of development : the presence of a number of lateral bristles on the outer surface of the forefemur and of longish thin bristles on the inner surface of the mid- and hindcoxae from the base to the apex may be taken as an earlier state from which have arisen in one direction the species in which the bristles both of the forefemur and of the inside of the coxae are reduced in number, and in another direction the species in which the former are preserved and the latter restricted to the apical half of the coxae or almost entirely lost. At first sight, the distinctions of these three groups of species do not seem to be of great importance, but nevertheless they hold good in all the American species, and also the Old World species can be grouped in the same way. But in the Old World the divisions are less well defined : we have here lines of development and therefore must expect intermediate stages to occur. The American species may accordingly be classified as follows :

Group A. Genus 1 to 3 : On outer surface of forefemur 1 or no lateral bristle (apart from the ventro-lateral ones).

Group B. Genus 4 to 10 : On outer surface of forefemur a number of small lateral bristles ; on inner surface of mid- and hindcoxae longish thin bristles from base to apex (apart from the bristles at the anterior margin).

Group C. Genus 11 to 18 : On outer surface of forefemur a number of small lateral bristles ; on inner surface of mid- and hindcoxae no longish thin bristles in basal half.

1. **Orchopeas** nov. gen.—Genotype : *O. wickhami* Baker 1895.

♂♀. Group A. First pair of plantar bristles of tarsal segment V ventral, in between second pair or almost ; hindtarsal segment I shorter than II to IV together. Incrassation of anterior margin of metasternum longer than broad, narrow.

♂. VIII. st. of abdomen narrow, without bristles, but ending with a long membranous flap, which is either ciliated and frayed, or smooth and curved upwards ; VIII. t. with few ventral bristles. Vertical arm of IX. st. elbowed on frontal side in or above middle, apical lobe of ventral arm not much longer than broad, strongly convex above, concave beneath, proximal lobe with short, pointed, conspicuous spiniform. Exopodite more or less ham- or club-shaped, being much narrower at base than in apical half or two-thirds, with a row of from 4 to 7 spiniforms, which are short, pointed, of practically equal size and directed upwards, below apex a long marginal bristle.

♀. At and near ventral angle of X. t. proximally to stylet more than 2 bristles. Stylet not noticeably curved. Spermatheca barrel-shaped, widest at apex, its head longer than broad, longer than tail.

Nearctic only.——Here belong, besides the genotype, *O. cadens* Jord. 1925

(= ? *labiatus* Baker), *O. latens* Jord. 1925, *O. labiatus* Baker 1904, *O. leucopus* Baker 1904, *O. nepos* Roths. 1905 and *O. sexdentatus* Baker 1904.

2. **Opisodasys** nov. gen.—Genotype: *O. vesperalis* Jord. 1929.

♂♀. Group A. Genal margin more incurved and frontal tubercle somewhat smaller than in *Orchopeas*. Pronotal comb with more than 20 spines, rarely 19. Incrassation of anterior margin of metasternum shorter than broad. First pair of plantar bristles of tarsal segment V ventral as in *Orchopeas*; segment I of hindtarsus shorter than II to IV together.

♂. VIII. t. of abdomen either with numerous ventral bristles or with a ventral-apical pointed projection; VIII. st. narrow, widened at apex or not, with bristles at apex or in middle, without the membranous apical flap of *Orchopeas*. Exopodite with 2 or 3 spiniforms which are directed downwards or distad. Anterior margin of vertical arm of IX. st. straight; apical lobe of ventral arm much longer than broad, proximal lobe without dark brown spiniform. Anal sternite narrow, long (not conical in lateral aspect), with long bristles.

♀. Anal tergite without lateral bristles except 2 (rarely 3) at angle proximally to stylet; anal sternite ventrally slightly rounded or nearly straight, not angulate, its bristles straight. Stylet more or less distinctly curved. Head of spermatheca longer than broad, longer than tail, dorsally convex.

Nearctic only.——Here belong, besides the genotype, *O. enoplus* Roths. 1909, *O. keeni* Baker 1896, *O. pseudarctomys* Baker 1904 and *O. robustus* Jord. 1925.

3. **Tarsopsylla** Wagn. 1927.—Genotype: *T. octodecimdentatus* Kolen. 1863.

♂♀. Group A. No frontal tubercle. Midtarsal segment I longer than II, hindtarsal I longer than II to IV together, at least one apical bristle of II extending beyond III; first pair of plantar bristles of V ventral. Episternum of metathorax narrow.

♂. Hindtarsus and segment I of midtarsus with long thin bristles. 3 antepygidial bristles, upper one minute. VIII. t. with dorsal spiculose area on inside. VIII. st. long, with apical pair of long bristles and a hirsute broad flap. Manubrium of IX. t. as long as manubrium of clasper. Process of clasper long; exopodite long, its upper third widened. Anal sternite narrow, much longer than tergite, with a row of dorso-marginal bristles.

♀. Bristles of segment II of antenna long. 3 or 4 antepygidial bristles. Stylet with one lateral bristle. Anal tergite depressed in between the bases of the stylets. Head of spermatheca barrel-shaped, one-half or one-third longer than broad.

Palaearctic and Nearctic.——Here belongs *T. coloradensis* Baker 1895.

4. **Thrassis** nov. gen.—Genotype: *Th. acamantis* Roths. 1905.

♂♀. Group B. Bristles of segment II long. Basal abdominal sternite without patch of lateral bristles in upper anterior area (at most 1 bristle present). On outer side of hindfemur no complete sublateral row of bristles, always fewer bristles on outer side than on inside. At least 1 bristle of segment II of hindtarsus extending well beyond IV.

♂. VII. t. more or less deeply excised between the two sets of antepygidial bristles. VIII. st. large, not reduced to a narrow horizontal sclerite, without long filamentous apical appendage. 1 long and 2 minute antepygidial bristles. Anal sternite not extending beyond tergite, the two together conical. IX. t. without projecting manubrium (its frontal margin about at right angles with the manubrium of the clasper). Process of clasper broad, rounded at apex ; exopodite narrow or short, vertical from close to base, more or less distinctly inclining frontad. Wire-like levers of penis long, but at most coiling round once.

♀. 2 or 3 antepygidial bristles. Stylet with 2 or 3 longish lateral bristles. Head of spermatheca globular or higher than long, quite short as compared with tail. Bursa copulatrix (plus its duct) long, without sclerification at bases of the ducts.

Nearctic.——Here also belong : *Th. arizonensis* Baker 1898, *Th. fotus* Jord. 1925, *Th. francisi* Fox 1924, *Th. howelli* Jord. 1925 and *Th. petiolatus* Baker 1904, in all of which the hindtarsal segment I is shorter than II to IV together, as well as *Th. bacchi* Roths. 1905, *Th. gladiolis* Jord. 1925 and *Th. pansus* Jord 1925, in which segment I of hindtarsus equals II to IV.

5. **Diamanus** gen. nov.—Genotype : *D. montanus* Baker 1895.

♂♀. Group B. Close to *Thrassis*, but in ♂ the bristles of antennal segment II short, dorsal groove of occiput deep, VIII. st. quite small, recalling *Myoxopsylla* Wagn. 1927, exopodite very long, narrow, bent frontad, sword-like, and levers of penis coiling round more than once ; in ♀ 2 antepygidial bristles, about equal in length, and the dorsal lateral bristle of stylet much smaller than the ventral one.

Nearctic and Palaearctic.——Here belongs, beside the genotype : *D. mandarinus* J. & R. 1911.

6. **Opisocrostis** nov. gen.—Genotype : *O. hirsutus* Baker 1895.

♂♀. Group B. Frontal tubercle distinct, external, more or less obtuse. Bristles of segment II of antenna long. Basal abdominal sternite with a number of slender bristles in upper anterior half. Hindfemur with a row of sublateral bristles on outside (as well as on inside).

♂. VII. t. not excised between the two sets of antepygidial bristles (1 long, 2 minute). VIII. st. reduced to a slender horizontal sclerite which bears 2 long bristles and an apical long filamentous appendage. Anal sternite and tergite together conical ; apical area of IX. t. behind sensory plate rather large and spinulose. Process of clasper inclining distad ; exopodite more or less elongate. Levers of penis coiling once round.

♀. 2 antepygidial bristles, of which the lower is distinctly the shorter. Head of spermatheca higher than long. Bursa copulatrix (plus duct) long, its apex curved down, around the bases of the duct of the spermatheca and the blind duct a sclerification. Anal sternite with ventral bristles from near base, outline of under surface not angulate.

Nearctic.——Here also belong : *O. bruneri* Baker 1895, *O. labis* J. & R. 1922, *O. saundersi* Jord. 1933 and *O. tuberculatus* Baker 1904.

7. **Oropsylla** Wagn. & Joff 1926.—Genotype : *O. silantiewi* Wagn. 1898.

♂♀. Group B. Frontal tubercle sharp, more or less sunk into frons. Rostrum reaching beyond trochanter. Basal abdominal sternite without patch

of bristles on side, at most with 1 or 2 in or below middle (besides the usual ventral bristles).

♂. Bristles of segment II of antenna short (not reaching to middle of club). VII. t. not excised medianly between the sets of antepygidial bristles (1 long, 1 minute). VIII. st. narrow, rod-like, without membranous apical appendage, apex sharply defined, with long bristles. Process of clasper broad; exopodite claviform. Apical membranous area of IX. t. about one-third as long as pygidium, not spinulose. Levers of penis with one complete convolution, or a little longer.

♀. 3 or more antepygidial bristles. Stylet with 2 or more lateral bristles. Head of spermatheca longer than broad, ovate or pyriform, tail short, not (or not much) longer than head, always with long appendage. Bursa copulatrix long, apex strongly curved ventrad, without sclerification at origin of the two ducts emanating from it.

Nearctic and Palaearctic.——Here also belong: *O. alaskensis* Baker 1904 (comb 25 or 26 spines!), *O. arctomys* Baker 1904, *O. idahoensis* Baker 1904 (= *poeantis* Roths. 1905 = *bertholfi* Fox 1927), and *rupestris* Jord. 1929. Palaearctic species enumerated in Wagner, *Katalog pal. Aphan.* p. 12, but *mandarinus* belongs to *Diamanus* (*cf.* above).

8. **Amphalius** nov. gen.—Genotype: *A. runatus* Jord. 1923.

♂♀. Group B. Frontal tubercle sharp, more or less sunk into frons. Eye not reduced. Rostrum reaching to apex of trochanter. Bristles of segment II of antenna long. Comb with more than 24 spines. Basal abdominal sternite without lateral bristles. Mid- and hind femora without a sublateral row of bristles on outside (apart from 2 or 3 bristles towards apex); bristles on midtarsal segment II very numerous, most of them slender; first pair of plantar bristles of V in all tarsi somewhat shifted inward and very distinctly bent ventrad-inward. VII. t. slightly projecting medianly in between the two sets of antepygidial bristles.

♂. VII. t. incised below cone of long antepygidial bristle, above the long bristle a minute one. VIII. t. very large, with a few spicules in dorsal area on inside; stigma cavity narrow and very long. VIII. st. narrow, fringed on upperside, before point of division a long bristle, a very large membranous fringed apical flap supported by a rod-like ventral continuation of the main portion of the segment. Vertical arm of IX. st. with tooth above middle of posterior margin. Process of clasper very long and narrow; exopodite with a long ventral process which is dilated at apex. Ejaculatory duct distally enclosed in a very long sheath which is curved frontad, then distad, then again frontad. Pale apical area of IX. t. behind pygidial plate about half the length of that plate, minutely spinulose at posterior margin. Anal sternite somewhat longer than tergite, narrow, with numerous bristles at apex and near it at dorsal margin.

♀. Stylet cylindrical, apex rounded off, bearing numerous bristles. Anal sternite angulate beneath, with bristles in apical half only. 3 antepygidial bristles. Bursa copulatrix (inclusive of its duct) very long, broad, of nearly the same width from base to apex; spermatheca long, without division between head and tail, head less than one-half wider than tail.

Nearctic and Palaearctic.——Here also belong: *O. necopinus* Jord. 1925 (Nearctic) and *O. clarus* J. & R. 1922 (Asiatic).

9. **Foxella** Wagn. 1929.—Genotype: *F. ignotus* Baker 1895.

♂♀. Group B. Frontal tubercle sharp if exposed. Rostrum not reaching trochanter. Eye vestigial. Upper eye-bristle above eye. Hindfemur with complete row of bristles on both sides. Segment V of hindtarsus shorter than III, all plantar bristles lateral.

♂. Bristles of segment II of antenna short. One long and one very short antepygidial bristle. VIII. st. small, without apical membranous lobe, close to apex a long bristle. Process of clasper narrow, conical; exopodite very long, narrow. Apical area of IX. t. behind pygidial plate setiferous at apex. Apices of anal tergite and sternite on a level, tergite conical, sternite not pointed, with many apical bristles (as in *Opisocrostis* and *Oropsylla*).

♀. Bristles of segment II of antenna long. 3 antepygidial bristles. Basal abdominal sternite with lateral bristles. Stylet with 2 or 3 lateral bristles. Anal sternite not distinctly angulate beneath, with bristles from near base. Spermatheca as in *Oropsylla*.

Nearctic.——Only one species, which has split up into a number of subspecies.

10. **Dactylopsylla** Jord. 1929.—Genotype: *D. bluei* Fox 1909.

♂♀. Group B. Like *Foxella*, but first pair of plantar bristles of tarsal segment V more distinctly bent downward-inward. Hindtibia with more than 20 stout dorsal bristles. The small bristles above antennal groove more numerous in ♂. Apical lobe of IX. st. of ♂ not hinged on to the segment, but continuous with it, the segment broadly sinuate ventrally, the sinus bounded by projections bearing bristles. Head of spermatheca longer than in *Foxella*.

Nearctic.——Here also belongs: *D. comis* Jord. 1929.

11. **Ceratophyllus** Curtis 1832.—Genotype: *C. hirundinis* Curtis 1832.

♂♀. Group C. Eye not reduced. Pronotal comb with 24 or more spines. Occiput with 2 lateral median bristles. Proboscis not reaching beyond apex of forecoxa. Bristles of segment II of antenna reaching in ♂ beyond middle of club, in ♀ beyond apex.

♂. 3 antepygidial bristles, 1 long, 2 minute. VIII. t. with spiculose dorsal area (sometimes restricted to margin). VIII. st. rod-like, with apical bristles (often spiniform) and apical flap. Apex of vertical arm of IX. st. widened posteriorly; ventral arm with the antemedian rounded dilatation and the proximal angle of apical lobe setiferous. Anal sternite narrow (lateral aspect), longer than tergite, with the bristles dorsal and apical.

♀. 3 antepygidial bristles, 1 long, 2 much shorter. Bursa copulatrix and spermatheca variable, in typical species the portion of duct of spermatheca nearest bursa copulatrix more strongly chitinised, being a conspicuous tube, and head of spermatheca cylindrical, concave above, several times as long as broad.

Palaearctic and Nearctic.——8 species are known from America: *C. celsus celsus* Jord. 1926 (*C. c. apricus* Jord. 1929 from Cuba), *C. diffinis* Jord. 1925, *C. gallinae* Schrank 1803, *C. garei* Roths. 1902, *C. gilous* J. & R. 1922, *C. idius* J. & R. 1920, *C. niger* Fox 1908, *C. riparius* J. & R. 1920.

12. **Dasypsyllus** Baker 1905.—Genotype: *D. gallinulae* Dale 1878.

♂♀. Group C. Occiput with more than 2 median bristles. Comb with 24 or more spines. Third pair of plantar bristles of tarsal segment V shifted on to ventral surface. One long antepygidial bristle and two minute ones in both sexes, or upper and lower bristles in ♀ at less than half as long as middle one. Eye very large. Frons with 2 or 3 rows of bristles. Bristles of segment II of antenna long. Stylet with one longish lateral bristle.——Thus defined we can place into *Dasypsyllus* also the species from temperate South America. It is not a homogeneous assemblage.

Palaearctic, Oriental, Nearctic and Neotropic.——Here belong, besides the genotype (which occurs in the Palaearctic and Nearctic Regions, 2 subspecies): *D. aemulus* Jord. 1933, *D. araucanus* J. & R. 1920, *D. comatus* Jord. 1933, *D. cteniopus* J. & R. 1920, *D. klossi* Roths. 1919 (Sumatra) and *D. lasius* Roths. 1909. The most aberrant is *D. cteniopus*, which agrees in many details with *M. telchinum*.

13. **Malaraeus** nov. gen.—Genotype: *M. telchinum* Roths. 1905.

♂♀. Group C. Eye distinctly reduced, its longest diameter shorter than the distance from eye to apex of angle of the strongly chitinised portion of the genal lobe. 2 to 4 median bristles on occiput. Bristles of segment II of antenna short in ♂, reaching beyond middle of club or being shorter in ♀.

♂. VIII. t. at most with traces of spiculose area at dorsal margin. VIII. st. quite reduced (*telchinum*, *eremicus*, *sinomus*), or long and narrow, bearing a long apical bristle and a fringed membranous flap (*euphorbi*, *bitterootensis*, *penicilliger*). Apex of vertical arm of IX. st. rounded on posterior side, not or little dilated.

♀. Stylet without a dorsal lateral bristle. Stout bristles of anal sternite markedly curved. Head of spermatheca broad, more or less barrel-shaped, but concave beneath, widest either near orifice or in middle, much longer than broad, twice as wide as tail.

Nearctic and Palaearctic.——Here belong 5 species besides the genotype, all Nearctic, with the exception of *penicilliger*, which is circumpolar: *M. eremicus* Baker 1904 (remarkably different in the ♂-genitalia), *M. bitterootensis* Dunn & Parker 1923 (= *isus* Jord. 1925), *M. euphorbi* Roths. 1905, *M. penicilliger* Grube 1852 (♂-genitalia very different), and *M. sinomus* Jord. 1925.

14. **Nosopsyllus** nov. gen.—*N. fasciatus* Bosc 1801.

♂♀. Group C. As in *Malaraeus* n.g., but segment I of the hindtarsus a little shorter than II and III together, no bristle of I and II reaching beyond the segment following. Eye not reduced.

♂. Anal tergite narrow, conical, dorsally with bristles to near base, anal sternite not extending beyond tergite, with bristles only at apex and dorsal margin. VIII. st. quite small, within VII. st., without bristles. Vertical arm of IX. st. triangularly dilated on frontal side below apex, which is narrow; in middle of ventral arm a narrow sinus, proximally of sinus a few short bristles, one of which is thicker and longer than the others, apical half of IX. st. broad.

♀. Anal sternite angulate in middle. Bursa copulatrix with long, rather strongly chitinised duct, upper end membranous, rolled up in a spiral. Sperma-

theca with larger head, which is more strongly rounded above than below, at the most one-third longer than broad, tail long and about half as wide as the head.

Old World; besides the genotype another species has reached America: *N. londiniensis* Roths. 1903. The Chilean *N. endymionis* Roths. 1904 is possibly distinct from *N. fasciatus*; only some ♀♀ are known.

15. **Megabothris** nov. gen.—Genotype: *M. walkeri* Roths. 1902.

♂♀. Group C. Stigma-cavity of VIII. t. very large, stigmata of metepimerum and abdominal segment II rather large and appearing doubled up (as in *Ceratophyllus*). Eye not reduced. No bristle of hindtarsal segments I and II reaching beyond the segment following.

♂. Longest bristles of segment II of antenna extending to near or just beyond middle of club. VIII. st. narrow, with 1 or 2 apical bristles (each side) and a membranous flap. Vertical arm of IX. st. widest at apex. Exopodite with conspicuous dark spiniforms.

♀. Bristles of segment II of antenna reaching to near or to apex of club. Stylet with at least 2 lateral bristles. Head of spermatheca much longer and broader than tail, of even width or somewhat narrowed towards tail.

Nearctic and Palaearctic.——Here also belong, of American species: *M. abantis* Roths. 1905, *M. acerbus* Jord. 1925, *M. asio* Baker 1904, *M. atrox* Jord. 1925, *M. groenlandicus* Wahlgr. 1903, *M. immitis* Jord. 1929, *M. lucifer* Roths. 1905, *M. megacolpus* Jord. 1925, *M. quirini* Roths. 1905; of Palaearctic species (besides the genotype): *M. rectangulatus* Wahlgr. 1903 and *M. turbidus* Roths. (= *mustelae* Wagn. nec Dale) (and possibly others not in our collection).

The species here united in one genus present many important differences; but it is convenient to keep them together. *M. atrox* with its comb of more than 25 spines recalls the Bird-fleas (*Ceratophyllus* s.str.).

16. **Pleochaetis** nov. gen.—Genotype: *P. mundus* J. & R. 1922.

♂♀. Group C. Frons with 2 or 3 rows of bristles, on occiput 2 or more behind base of antennal groove and 3 or more in middle. Rostrum not extending beyond apex of forecoxa. Hindtarsus without long bristles; first pair of plantar bristles more or less distinctly bent ventrad-distad.

♂. Bristles of segment II of antenna short. Spiculose dorsal area of VIII. t. barely vestigial, at base of margin. VIII. st. narrow, short or long, with one or more apical bristles and with or without membranous flap. Anal sternite not extending beyond tergite, bristles apical and subapical.

♀. Bristles of segment II of antenna not reaching to apex of club, usually short. 1 long and 2 short antepygidial bristles. (Spermatheca of 2 different types.)

Neotropic northward to Arizona.——Here also belong: *P. apollinaris* J. & R. 1921, *P. campaniger* Jord. 1931, *P. dolens* J. & R. 1914, *P. equatoris* Jord. 1933, *P. graphis* Roths. 1909, *P. sibynes* Jord. 1925.

The species probably represent at least 2 genera. In the ♀♀ of *P. graphis* and *P. campaniger* the stylet has only 1 lateral bristle and the head of the spermatheca is subglobular, whereas in the 5 other species the stylet has 2 lateral bristles and the head of the spermatheca is much narrower and nearly oblong.

17. **Monopsyllus** Kolen. 1857.—Genotype: *M. sciurorum* Schrank 1803.

♂♀. Group C. Eye not reduced, its longest diameter longer than the distance of the eye from the angle of the strongly chitinised portion of the genal lobe. On occiput 2 median bristles, upper small. Comb with 22 or fewer spines. No bristles on hindtarsal segments I and II extending beyond the segment following.

♂. Bristles of segment II of antenna not reaching beyond middle of club. 1 long antepygidial bristle and 2 minute ones. VIII. t. without spiculose dorsal area on inner side. VIII. st. narrow, with or without membranous apical flap. Frontal margin of IX. t. forming with manubrium of clasper an angle much smaller than 90°, the angle rounded off.

♀. Bristles of segment II of antenna reaching to or beyond apex of club. Stylet with 2 lateral bristles. Spermathecae of different types.

This diagnosis permits us to place into *Monopsyllus* some Nearctic species which are not very nearly related to *M. sciurorum*.

Palaearctic and Nearctic.——Here belong 9 species besides the genotype; Palaearctic: *M. indages* Roths. 1908, *M. argus* Roths. 1908 and *anisus* Roths. 1907 (all three near *M. sciurorum*); Nearctic: *M. eumolpi* Roths. 1905, *M. ciliatus* Baker 1904, *M. vison* Baker 1904, and *M. wagneri* Baker 1904, *M. thambus* Jord. 1929 and *M. enderleini* Wagn. 1933 (the last three might be separated generically on account of the peculiar spermatheca, which, however, is not yet known of *M. thambus*).

18. **Mioctenopsylla** Roths. 1922.—Genotype: *M. arctica* Roths. 1922.

♂♀. Group C. Pronotum long, with an additional row of bristles; spines of comb quite short, not longer than the apical spines of the abdominal segments.

Circumpolar.——Only one species known (synonym: *Boreopsyllus hadweni* Ewing 1827).

KEY TO THE GENERA.

Group A.—Outer surface of forefemur with 1 or no lateral bristle; no thin longish bristles on inside of mid- and hindcoxae from base to apex.

a. Segment I of hindtarsus longer than II to IV . . 3. *Tarsopsylla*
,, ,, ,, shorter ,, ,, . . . *b*

b. ♂: VIII. st. with apical membranous appendage, F with 4 to 7 short spiniforms directed upwards. ♀: ventral margin of X. st. distinctly angulate near middle . . . . . 1. *Orchopeas*
♂: VIII. st. without apical membranous appendage, F with 2 or 3 spiniforms direct downwards or distad. ♀: ventral margin of X. st. not distinctly angulate . . . 2. *Opisodasys*

Group B.—Outer surface of forefemur with several small lateral bristles; on inside of mid- and hindcoxae longish thin bristles from base to apex.

c. Eye vestigial . . . . . *d*
Eye well developed . . . . . *e*

d. Hindtibia with fewer than 20 stout dorsal bristles . . 9. *Foxella*
,, ,, more ,, ,, ,, ,, . 10. *Dactylopsylla*

e. ♂: ejaculatory duct deeply curved twice, apex directed frontad. ♀: stylet stout, cylindrical, with numerous bristles at apex 8. *Amphalius*

♂: ejaculatory duct normal. ♀: stylet with 1 apical bristle, which is long . . . . . *f*

f. ♂: VIII. t. large, not reduced to a narrow horizontal sclerite. ♀: basal abdominal sternite without patch of lateral bristles, head of spermatheca broader than long, stylet with 2 or 3 lateral bristles 4. *Thrassis*

♂: VIII, st. quite small. ♀: dorsal lateral bristle of stylet much smaller than ventral one . . . . . 5. *Diamanus*

♂: VIII. st. narrow, horizontal, with apical bristles and apical membranous flap. ♀: basal abdominal sternite with patch of latera bristles, head of spermatheca broader than long 6. *Opisocrostis*

♂: VIII. st. narrow, horizontal, with apical bristles, but without apical membranous flap. ♀: head of spermatheca longer than broad, ovate or pyriform . . . . . 7. *Oropsylla*

Group C.—Outer surface of forefemur with a number of small lateral bristles; on inner side of mid- and hindcoxae longish thin bristles at most in apical half.

g. Spines of comb quite short . . . . . 18. *Mioctenopsylla*

,, ,, normal . . . . . *h*

h. Stigma of VIII. t. much enlarged . . . . 15. *Megabothris*

,, ,, normal . . . . . *i*

i. In comb 24 or more spines. Eye not reduced . . . *j*

,, fewer than 24 spines . . . . . *k*

j. Third pair of plantar bristles of tarsal segment V moved on to ventral surface . . . . . 12. *Dasypsyllus*

Third pair of plantar bristles lateral . . . 11. *Ceratophyllus*

k. Occiput with 2 or more longish bristles behind base of antennal groove and 3 or more in middle . . . . . 16. *Pleochaetis*

Occiput with 1 or no longish bristle behind base of antennal groove *l.*

l. Eye distinctly reduced, its longitudinal diameter shorter than the distance of eye from apex of incrassate portion of genal lobe 13. *Malaraeus*

Eye not reduced . . . . . *m*

m. ♂: VIII. st. vestigial, without bristles. ♀: apex of bursa copulatrix rolled up as a spiral . . . . . 14. *Nosopsyllus*

♂: VIII. st. a narrow horizontal sclerite with bristles and an apical membranous flap. ♀: apex of bursa copulatrix not rolled up as a spiral . . . . . 17. *Monopsyllus*

ON SOME AETHIOPIAN *ARCTIIDAE* (LEPID.).

BY DR. KARL JORDAN, F.R.S.

(With 11 text-figures.)

THERE are in tropical Africa a number of species of Arctiids which recall by their black-dotted white wings the European *Spilosoma lubricipeda* L. 1758. They are distributed in Hampson, *Lep. Phal.* iii (1901) and *Suppl.* ii. (1920), among the genera *Diacrisia* (in 1920 replaced by *Spilosoma*, which is younger than *Diacrisia*), *Estigmene* and *Amsacta*. The authors of the species have generally relied on some differences in the number of spots. A cursory examination of a series of specimens proved (1) that the maculation is very variable within the species, and (2) that specimens agreeing in colour and pattern may be quite different in the ♂-genitalia and therefore belong to different species. As none of the authors who described and named the various "species" have compared the tail-ends, a re-examination of the species-types is a necessity. It is the object of the present paper to supply a future monographer of the Arctiids with descriptions and sketches of the genitalia of some of the types to which I have had access. No revision of the genera in question is intended, nor have I seen all the described black-dotted white African species of *Diacrisia* (s. lat., Hampson). Besides the types in the Tring Museum and some in the British Museum, I have examined some of Bartel's types which Professor M. Hering very kindly sent me.

I. SPILOSOMA (Hampson, *l.c.* iii, p. 256, as *Diacrisia*).

Foretibia without apical claw; hindtibia with two pairs of spurs.——The apex of the foretibia is not truncate, but subdorsally somewhat emarginate, there being a short projection dorsally and another laterally corresponding to the "claws" of *Estigmene*, *Amsacta* and *Hyphantria*. The presence or absence of the proximal pair of spurs on the hindtibia is not really of generic value in this case, as is proved by *Spilosoma affinis* Rothsch. 1910. Hampson had already noticed in *Amsacta* that this distinction did not hold good in some species.

In the species here dealt with the eighth tergite of the ♂ (VIII. t.) has either a more or less distinct median tooth or a sharp tooth on each side at some distance from the middle; the eighth sternite is medianly depressed and the median portion of the apical margin is curved upwards, the angles of this turned-up lobe often being tooth-like. The anal tergite (X. t.) is sharply pointed, the apical portion, viewed from above, being pyriform; the median line is raised, and the tip slightly curved down. The pleural clasping organs consist of a pair of long valves, one valve each side, of which the apical portion is divided into two broad lobes, more or less spatulate, the apical lobe being marked P^1 in our figures and the subapical lobe P^2; P^1 is always simple, at the most faintly emarginate at the apex, whereas P^2 is divided into two lobes in two of the species, being in one of these divided in the left valve and not divided in the right; in most cases P^2 is more strongly curved inward-dorsad than P^1; both lobes are individually variable in length, width and curvature, the two valves showing frequently

marked differences from each other. The ninth sternite (IX. st.) in between the bases of the valves is swollen and usually subglobular. The penis-sheath (Pen) bears teeth on the outer surface in some species and not in others, while the membranous reversible inside has numerous teeth in all the species. The penis-funnel (P-F) differs more or less in the various species.

The genitalia of the ♀♀ have not yet been studied extensively; the seventh

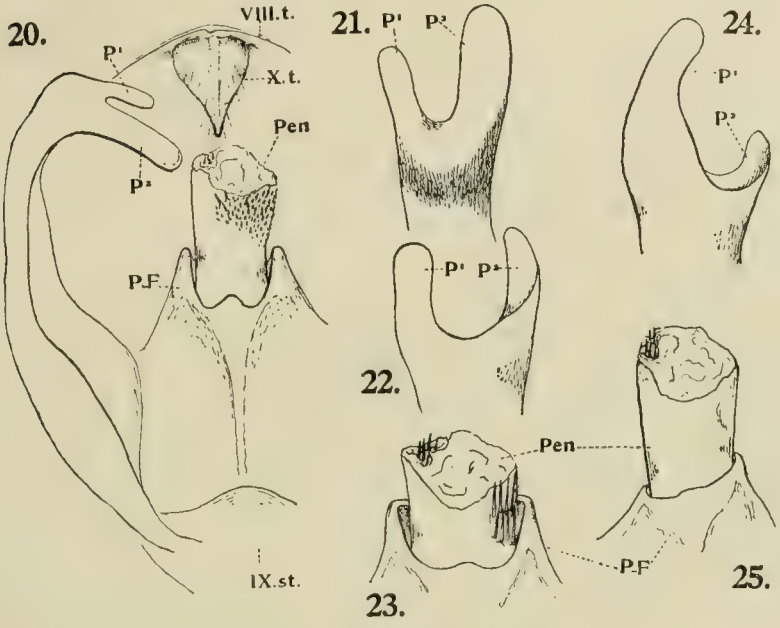


FIG. 20.—*Sp. assimilis assimilis*, ♂-genitalia, ventral aspect.
„ 21.—*Sp. assimilis assimilis*, end of clasper, lateral aspect.
„ 22.—*Sp. assimilis indeterminate*, end of clasper, lateral aspect.
„ 23.—*Sp. assimilis indeterminate*, penis-funnel and penis-sheath, ventral aspect.
„ 24.—*Sp. assimilis rattrayi*, end of clasper, lateral aspect.
„ 25.—*Sp. assimilis rattrayi*, penis-funnel, and penis-sheath.

sternite is swollen in all species and apically somewhat incised in middle. It will be necessary to compare the spermathecae before one can be sure to which ♂♂ some of the ♀♀ belong.

1. **Spilosoma assimilis** Hübn. 1822.

Phalaena Bombyx maculosa Stoll, *Pap. Exot.* iv. p. 156, tab. 370, fig. B. (1781) (S. Leone), nec *Ph. Bombyx maculosa* Gerning (ex W. Verz.) 1780.
Ecpantheria assimilis Hübner, Verz. p. 183 (1822).
Diacrisia maculosa, Hampson, *Lep. Phal.* ii. p. 276 (1901) (partim).

The specific name *maculosa* Stoll cannot be used for this species on account of the earlier *maculosa* Gerning. Hübner noticed that the name given by Stoll was preoccupied and therefore renamed the species *assimilis*.

In all the forms here united as subspecies of *S. assimilis* the spots of the forewing have pale centres, as a rule all or nearly all, sometimes only a few. Most specimens have the anterior angles of the frons or a larger portion of the frons blackish or brown, rarely is the frons entirely white (cf. first subspecies).

VIII. t. with small median tooth (text-fig. 20) ; the two processes P^1 and P^2 of the valve simple. IX. st. less strongly swollen than in the species following.

From West Africa to Arabia, not in South Africa, in a number of subspecies.

a. **S. assimilis assimilis** Hübn. 1822.

Ph. B. maculosa Stoll, *l.c.* ; *E. assimilis* Hübn., *l.c.* ; *Alpenus aequalis* Walker (1855).

Frons sometimes quite white. The two processes P^1 and P^2 (text-fig. 20) spatulate, curved inward, the sinus between them narrow (text-fig. 21). Penis-sheath (Pen) with a patch of short teeth on the right side. Penis-funnel (P-F) conical at each side of the sheath, rather strongly chitinised ; ventral median projection of funnel distinct.

Senegambia and Sierra Leone.

The difference between this insect and the next is very evident in all our ♂♂. As we have from Sierra Leone also a specimen of the next subspecies, there would be some justification in regarding *assimilis* as a distinct species.

b. **S. assimilis indeterminata** Walk. 1855.

Ecpantheria indeterminata Walker, *List Lep. Ins. B.M.* iii. p. 697. no. 15 (1855) (Ashanti).
? *Halesidota* ? *macularia* id., *l.c.* xxxi. p. 314 (1864) (New York !).
Spilosoma eyralpenus Plötz, *Ent. Zeit. Stettin*, xli. p. 83 (1880) (Camerum).
Spilosoma rattrayi, Hampson, *l.c. Suppl.* ii. p. 373, pl. 58, fig. 16 (1920) (partim).

Frons always with some black colouring, at least at the anterior corners. The two processes of the clasper always wider apart than in *D. a. assimilis*, each variable in length, the lower process P^2 usually strongly curved inward-upward, mostly with a raised line across its outer surface as continuation of the edge of the sinus between the two processes (text-fig. 22, dorso-apical aspect), the sinus sometimes larger than in our figure, and P^2 often shorter. Penis-sheath (Pen) usually with a patch of long spines on the right side resembling the spines of the inside ; raised sides of penis-funnel (P-F) not conical as in *D. a. assimilis*, but broad, forming a collar which somewhat extends on to the dorsal side of the sheath.

Sierra Leone (1 ♂), southward to Angola and the Upper Congo.

c. **S. assimilis rattrayi** Rothsch. 1910.

Diacrisia rattrayi Rothschild, *Nov. Zool.* xvii. p. 129 (1910) (Entebbe).
Spilosoma rattrayi, Hampson, *l.c. Suppl.* ii. p. 373 (1920) (partim, nec fig.).

Frons sometimes without black corners. Median tooth of VIII. t. longer than in the previous race, lower lobe P^2 of clasper shorter (text-fig. 24), strongly curved upward (not always so short as in the figure), penis-sheath without patch of spines on outside, and penis-funnel asymmetrical (text-fig. 25).——♀ more or less tinted with yellow.

Uganda.

d. **S. assimilis pardalina** Rothsch. 1910.

Diacrisia pardalina Rothschild, *l.c.* p. 128, pl. 14, fig. 14, ♀ (1910) (partim ; Ukerewe).
Spilosoma pardalina, Hampson, *l.c. Suppl.* ii. p. 374 (1920) (Ukerewe, type ♀).

Frons more extended blackish than in *D. a. rattrayi*, ♀ darker buffish.

♂-genitalia as in *S. a. rattrayi*.

Ukerewe, Kavirondo and Tanganyika Territory.

e. **S. assimilis schraderi** Rothsch. 1910.

Diacrisia schraderi Rothschild, *l.c.* p. 128, pl. 14, fig. 29 (1910) (Erythraea).
Spilosoma diversata Hampson, *l.c. Suppl.* ii. p. 372, pl. 58, fig 15, ♀ (1920) (Somaliland).
Spilosoma schraderi, Hampson, *l.c. Suppl.* ii. p. 374 (1920) (type ♀).

Like *S. a. rattrayi*, but the spots at the base of the forewing rather smaller. Hardly distinguishable without the help of the locality label. ♂-genitalia without reliable distinction from those of *S. a. rattrayi*.

Erythraea and Somaliland.

f. **S. assimilis yemenensis** Hamps. 1920.

Spilosoma yemenensis Hampson, *l.c. Suppl.* ii. p. 374, pl. 58, fig. 17, ♂ (Yemen).

The spots of the forewing enlarged, more or less confluent, occupying more space than the white ground. ♂-genitalia not examined very closely.

Yemen.

2. **Spilosoma oligosticta** Hamps. 1920.

Estigmene jacksoni Rothschild, *l.c.* p. 164 (1910) (Uganda), nec *Spilosoma jacksoni* Rothschild, *ibid.* p. 140 (1910).
Spilosoma oligosticta Hampson, *l.c. Suppl.* ii. p. 368, pl. 48, fig. 14 (1920) (Uganda; n. nov.).

The type-specimen is much worn, therefore semihyaline. The average specimen agrees with the figure of *S. investigatorum* in Hampson, *l.c. Suppl.* ii. pl. 18, fig. 18 (1920). I cannot find any colour difference between *S. oligosticta* and *S. investigatorum*. In both species the frons is always entirely white, and the spots of the forewing have no pale centres. ♂-genitalia very different from those of *S. assimilis*; VIII. t. (text-fig. 26) with a sharp tooth each side; the right and left claspers different, the lower process P^2 of the right clasper simple, shorter than P^1; in the left clasper P^2 divided into two lobes and the apical process P^1 shorter than that of the right clasper. This asymmetry noticeable also in the penis-funnel, the collar around the penis-sheath being somewhat higher on the right side than on the left. Penis-sheath (Pen) on the left side with a smooth apical hump which bears a short, stout, subconical tooth, visible as a rule in between the two lobes of P^2 of the left clasper in the specimens with the claspers in a normal rest-position (our figures are drawn from specimens in which the claspers have been artificially pressed sidewards).——Swollen VII. st. of ♀ smaller than in *S. assimilis*, less broad transversely.

Wings varying in ♂ and ♀ from being almost without spots to being densely spotted.

Gold Coast, Benue R., French and Belgian Congo, Angola, eastwards to the Lado Enclave and Kenya; evidently common in East Africa.

Here belong possibly also *S. microsticta* and *S. tristicta* Hamps. 1920, which I have not examined. *Emminaria migropunctata* B. Baker (1908) may also belong here, in which case that specific name would have priority.

3. **Spilosoma investigatorum** Karsch 1898.

Spilosoma investigatorum Karsch, in Werther, *Hochl. Deutschostafrika*, p. 313 (1893) (Bagamoyo); Hamps., *l.c. Suppl.* ii. p. 375, pl. 58, fig. 18 (1920) (partim).
Spilosoma cribraria Bartel, *Iris*, xvi. p. 176 (1903) (Mhondo, ♂).
Spilosoma mhondana id., *l.c.* p. 179 (1903) (Mhondo, ♀).

The types of the three names mentioned in the synonymy have been compared by me; *S. cribraria* is a ♂ with the genitalia as in *S. investiga-*

torum; *S. mhondana* is a ♀ obtained at the same place by the same collector as *S. cribraria* and is according to the VII. st. a specimen of this species.

As in *S. oligosticta*, the frons without black; tergite VIII as in that species with two teeth, of variable length. Anal tergite (X. t.) broader. Apex of clasper more strongly curved, the right and left claspers practically alike, in both claspers process P^2 forked (text-fig. 27). Penis-sheath without the large hump of *S. oligosticta*. Penis-funnel forming a lower collar.——Swelling of VII. st. of ♀ broader than in *S. oligosticta*.

Uganda, Kenya, Tanganyika Territory and Nyasaland.

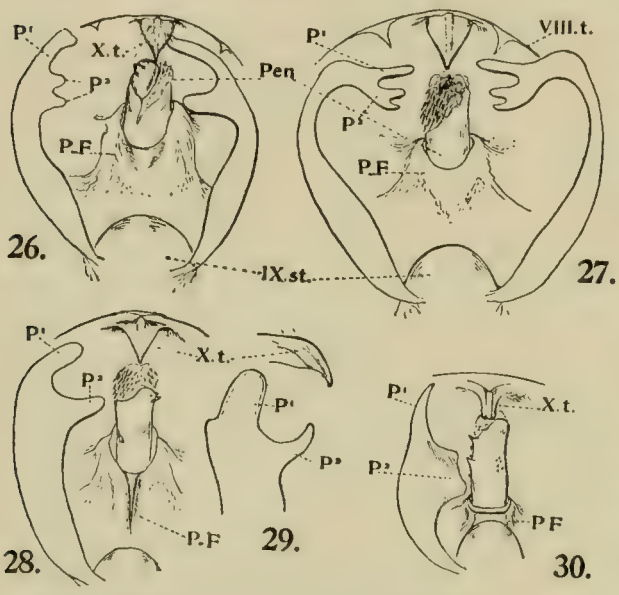


FIG. 26.—*Sp. oligosticta*, ♂-genitalia, ventral aspect.
,, 27.—*Sp. investigatorum*, the same.
,, 28.—*Sp. diffinis*, the same.
,, 29.—*Sp. diffinis*, end of X.t. and of clasper, lateral aspect.
,, 30.—*Est. purus*, ♂-genitalia, ventral aspect.

4. Spilosoma diffinis n. nov.

Diacrisia affinis Rothschild, *l.c.* p. 172 (1910) (Lokoja, Niger), nec *Spilosoma affinis* Bartel 1903.

Hindtibia with one pair of spurs, as in *Creatonotus* (Hampson, *l.c.* iii. p. 331), but in one of the 15 specimens before me (9 ♂♂, 6 ♀♀) the subapical pair is represented by one spur on the left hindleg and by two on the right one. In spite of the usual absence of these spurs, the species is closely related to the other *Spilosoma* here dealt with. Tergite VIII of the ♂ resembles that of *S. assimilis* in being medianly produced into a tooth, which is obtuse, the margin of the segment usually being slightly incurved at each side of the projection. Anal tergite less widened subapically than in the three previous species, but with a very distinct median ridge. Right and left claspers alike, with two simple processes, the upper one very broad, with the dorsal margin abruptly widened, there being a distinct projection (text-fig. 29), which is absent from the other species. On the right side of the penis-sheath a few apical teeth. Penis-funnel with median ventral ridge.—— VII. st. of ♀ with a swelling which is somewhat wider transversely than longitudinally.

Spots of wings small, not very numerous in any of our specimens (fewer than 40 dots on the forewing), sometimes only a few dots present; hindwing without subanal spot or this very small.

Senegambia (8 ♂♂, 5 ♀♀), Lokoja (1 ♂, type), White Nile (1 ♀).

II. ESTIGMENE Hübn. 1822.

The genotype *E. acrea* Drury 1773 selected by Hampson is very different from the African species of which I figure here the genitalia; but both have the foretibia armed with a pair of apical claws, of which the dorsal (or inner) one is fairly prominent. Hindtibia with two pairs of spurs. The ♂-genitalia differ considerably from those of the preceding species of *Spilosoma*.

1. Estigmene purus Butl. 1878.

Alpenus purus Butler, *Proc. Zool. Soc. Lond.* 1878, p. 382 (Abyssinia).
Estigmene pura, Hampson, *l.c.* iii. p. 343, pl. 47, fig. 3, ♀ (1901) (Brit. E. A.).
Spilosoma edlingeri Bartel, *Iris*, xvi. p. 180 (1903) (Benue R.).
Diacrisia albescens Rothschild, *l.c.* p. 122 (1910) (Ogruga, Niger).
Amsacta evadne Fawcett, *Proc. Zool. Soc. Lond.* 1915, p. 93, pl. i. fig. 4, ♂ (Kedai, Brit. E. A.; type at Tring).
Estigmene evadne, Hampson, *l.c. Suppl.* ii. p. 437 (1920) (♀ "type" in B.M.).

The number of spots on the forewing varies from fewer than 5 to more than 50. The majority of specimens have one or more submarginal spots on the hindwing.

♂-genitalia: VIII. t. (text-fig. 30) without tooth. Anal tergite (X. t.) quite different from that of *Spilosoma assimilis* and allies in being truncate, and dorsally impressed in the middle, a distinct channel running to the apex. Clasper with two processes, the apical one, P^1, pointed, somewhat curved, subconical, the lower one very broad and short, placed about midway between base and apex, and its upper portion twisted dorsad, the lobe slightly emarginate and, at rest, closely appressed to the penis-sheath, the emargination of the lobe making a close approximation to the cylindrical sheath possible. Penis-sheath with a longitudinal row of teeth on the left side, of which 1 or 2 are largish, and a small patch of minute teeth on the right side. Penis-funnel short, its edge somewhat incrassate (marginate), forming a half-ring around the penis-sheath.——VII. st. of ♀ flat, with fairly sharp edge, which is broadly incurved and ends laterally in a short compressed lobe; VIII. st. with median transverse swelling, which is usually glossy.

Nigeria, Aïr, White Nile, Abyssinia, Kenya, Tanganyika Territory, Nyasaland, Portuguese E. Africa, S. Rhodesia, Angola.

FURTHER RECORDS AND DESCRIPTIONS OF ANTHRIBIDAE COLLECTED BY MR. F. C. DRESCHER ON JAVA.

BY DR. KARL JORDAN, F.R.S.

1. **Acorynus divortus** sp. nov.

♂♀. Closely resembling *A. sinuatus* Jord. 1926, from Sumatra, but the median vitta of pronotum entire, no luteous grey spots each side in transverse furrow, the brown spots in lateral area larger, the spots on elytra smaller, the conspicuous postmedian dorsal spot of *A. sinuatus* represented by two dots. Eyes not contiguous (in ♂ of *A. sinuatus* contiguous), in ♂ the frons about as wide as segment II of antenna is broad, in ♀ as wide as that segment is long.

Bajoekidoel, G. Raoeng, 450–700 m., 12.xi.1931, 1 ♂, type; Noesa Kambangam, 3.v.1926, 1 ♀.

2. **Acorynus pictus** Pasc. 1860.

Radjamandala, G. Pantjalikan, 900 m., 20.ii.1931 (L. J. Toxopeus), 1 ♂; Koebangkangkoeng, Zuid-Banjoemas, 25 m., 17.iii.1932, 1 ♀.——New for Java.

3. **Litocerus perakensis** Jord. 1894.

Noesa Kambangan, x.1926, 1 ♀.——New for Java.

4. **Litocerus petilus** sp. nov.

♀. Very close to *L. virgulatus* Jord. 1915, but more robust, the rostrum, club of antenna and elytra longer, pygidium shorter, and grey pubescence of elytra concentrated into larger spots.

Cinnamon-rufous, base of antenna and legs pale. Rostrum one-fourth longer than broad, with the same carinae as in *L. virgulatus*; distance from anterior margin of antennal groove to base of mandible the same as from posterior margin of groove to eye. Segment III of antenna not quite one-third longer than IV, IV to VIII nearly equal in length, IX almost twice VIII, IX to XI as long as IV to VIII together, the measurements being III 18, IV 14, V 12, IX 23, X 20, XI 22.

Pronotum more conical than in *L. virgulatus*, with the transverse groove sharply impressed and the angle of the carina strongly (almost evenly) rounded; sides punctate; the luteous-grey markings nearly as in *L. virgulatus*; in middle a wedge-shaped spot from transverse sulcus forward, and another from base to sulcus, both pointed anteriorly, the second extended sideways in front of carina and widened into a spot at one-third towards lateral carina, in front of this spot another spot at end of transverse sulcus, halfway between these spots and lateral carina a stripe from base to apex, subinterrupted, widest behind carina, a second, broader, stripe along lateral carina, anteriorly united with a subventral stripe, the two dorsal stripes connected with each other along dorsal carina, no separate spot between them.

Elytra narrower and less convex than in *L. virgulatus*, shoulder and three

limbal, elongate patches at equal distances between shoulder and apex blackish, the yellowish grey markings less numerous but larger than in *L. virgulatus*, namely, a small patch on frontal side of subbasal swelling, almost contiguous with an inverted subsutural comma-spot, the two forming a ring which is open posteriorly, the comma-spot extending farther back than the patch, behind the comma a square spot continued backwards by a thin line in stripe I of punctures, laterally of this line another in II, running forward to basal patch, behind subbasal callosity in III, IV and V a line more or less distinctly continued to base, behind middle a small spot in II contiguous with the line in II, and a larger spot occupying IV and V and the interspaces between; at beginning of apical declivity a transverse series of lineolae of which those in II and III form an elongate-triangular spot, apical margin with a somewhat conspicuous transverse patch extending forward near suture and including a brown dot at angle of suture; sides with luteous-grey spots between the brown patches; behind antemedian sutural luteous-grey spot a brown line, rounded in front or truncate and very thin behind. Pygidium one-third broader than long, pale luteous grey, with brown median spot.

Sides of meso-metasternites and abdomen pale. Femora pale luteous, with a brown subapical spot, tibiae pale luteous subbasally and at apex, tarsal segment I likewise pale at extreme base and extreme apex.

Length 4·4 mm., width 2·0 mm.

G. Tangkoeban Prahoe, Preanger, 4,000–5,000 ft., iv.v.1930, 2 ♀♀.

5. **Nessiodocus festivus** Jord. 1932.

Batoerraden, G. Slamat, ii. and iv.1932, 1 ♂, 2 ♀♀.——Described from a Javan ♀. In the ♂ segments III to VIII of antenna are of nearly equal length, longer than I and II together, IX and X about as long as broad and XI not quite twice as long as broad; pygidium vertical, rounded, nearly twice as broad as long.

6. **Nerthomma prominens** Jord. 1925.

Koebangkangkoeng, Zuid-Banjoemas, x. and xii.1932, 2 ♂♂, 2 ♀♀; Noesa Kambangan, ii.1932, 2 ♂♂, 3 ♀♀.——We have this species also from Pemalang (Fr. A. Th. H. Verbeek). Originally described from 2 Sumatran ♀♀. The antenna of the ♂ is longer than in the ♀, reaching beyond the apex of the elytra, the 3 segments of the club quite short.

7. **Exillis luteus** Jord. 1925.

Batoerraden, G. Slamat, vi.viii.ix.1932, 5 ♂♂, 9 ♀♀; Noesa Kambangan, vi.1932, 1 ♀.——Already recorded in Nov. Zool. xxxvi. p. 298 (1931). In the original diagnosis (*Ann. Mag. N.H.* (9), xvi. p. 263 (1921)), the description of the antenna should have read: segmento 3io quarto breviore (♂), aequilongo vel longiore (♀), and the record of specimens: several ♂♂ and ♀♀ (instead of 1 ♂); the various months of capture of the specimens were given, *l.c.* In Javan specimens the elytra, on the whole, are less deeply punctate, especially at base and apex, than in Sumatran examples.

8. **Exillis laticeps entimus** subsp. nov.

♂♀. Like *E. laticeps laticeps* Jord. 1925, from Sumatra (occurs also in Perak, Borneo, and at Singapore); differs in segment IV of antenna being only as long as III, whereas in *E. l. laticeps* it is much longer than III in both sexes. The original description should be amended accordingly; the ♀ mentioned there (*Ann. Mag.* (9). xvi. p. 261 (1925)) with "IV about as long as III" was a Javan specimen, not a Sumatran one.

Noesa Kambangan, ii.iv.1932, 1 ♀ (type), 2 ♂♂; Soekaboemi, 1 ♀.

9. **Phaulimia persiba hypomelas** subsp. nov.

♂. Differs from *Ph. p. persiba* Jord. 1928, from Mentawi, in the basal third or fourth of the suture and of the outer margin of the elytra being conspicuously brown-black, and the apical fourth of the elytra and the rest of the sides sparsely spotted with grey.

Koebangkangkoeng, Zuid-Banjoemas, 25 m., iii.iv.1932, 3 ♂♂.

10. **Autotropis fraterna** Jord. 1924.

Batoerraden, G. Slamat, iv.1932, 1 ♀; Noesa Kambangan, ii.1932, 1 ♂. ——Described from Sumatra; new for Java.

11. **Ozotomerus rugicollis** Jord. 1895.

Djeroeklegi, Zuid-Banjoemas, ix.1931, 2 ♂♂.

12. **Rhaphitropis vittatus** Jord. 1925.

Koebangkangkoeng, Zuid-Banjoemas, v.1932, 2 ♀♀.——New for Java. In one of the specimens the greater part of the elytra is shaded with grey. We have the species also from Tonkin, Perak and Sumatra, the specimens representing probably at least 2 subspecies.

13. **Apolecta transversa** Oliv. 1797.

Koebangkangkoeng, Zuid-Banjoemas, 25 m., ii.1932, 1 ♀.——New for Java.

14. **Apolectella corporaali** Jord. 1924.

Noesa Kambangan, ii.iii.1932, 2 ♂♂, 1 ♀.——Described from a Sumatran ♀. The antenna is but very little longer in the ♂ than in the ♀. The 3 Javan specimens are somewhat larger than the Sumatran one.

15. **Melanopsacus depexus** sp. nov.

♂♀. Elliptical, strongly convex from head to pygidium, very little under twice as long as broad, rufous, upperside marmorated with pale golden silky pubescence, the hairs of the pubescence directed obliquely sidewards, on the elytra partly also inwards, the markings of the pronotum changing shape and position according to the direction from which one looks at the specimen. Head and pronotum very densely punctate-reticulate. Frons a little less than half the width of rostrum (10 : 22).

Pronotum nearly one-fourth wider than long (55 : 45), slightly flattened medianly in front of carina; angle of carina slightly produced downwards, a

little smaller than 90°. Elytra very strongly punctate-striate, interspaces very densely granulate, moderately convex and golden grey, these stripes of pubescence more or less interrupted before and behind middle and before apex. Pygidium a little (about one-fifth) broader than long, quadrangular, with the apex rounded, densely reticulate-punctate ; the two halves of the elevate basal margin forming an angle of about 90° (but not actually meeting on account of the basal median sulcus) ; extreme tip in ♂ slightly swollen and smooth.

Antecoxal half of prosternum very densely reticulate-punctate, lateral area from meral suture to basal margin with 4 or 5 rows of large punctures, below acute angle of pronotum a small smooth area. Meso-metasternites more densely punctate in middle than at sides. Abdominal segments I to IV with two transverse rows of large punctures and at side a few additional punctures, V coriaceous, in ♂ I to IV medianly flattened, with a median tuft on II to IV.

Length : 2·5 mm.

Koebangkangkoeng, Zuid-Banjoemas, 25 m., ii.1932, 4 ♂♂, 1 ♀.

Near *M. calculus* Jord. 1924, from Borneo, but angle of pronotal carina produced not nearly so far downwards.

NEW SOUTH AMERICAN GEOMETRIDAE.

BY LOUIS B. PROUT.

SUBFAM. **HEMITHEINAE.**

1. **Chloropteryx rhodelaea** sp. n.

♂, 24–27 mm.; ♀, 30 mm. Similar to *anisoctena* Prout (1917), except as noted. Antenna of ♂ bipectinate, with the branches 2–3, of the ♀ on the outer side serrate to subpectinate, on the inner (to near the base) with very short but true pectinations. Palpus of ♂ rather longer. Abdomen with black dorsal spots, variable in degree of development.

Forewing with SC^1 stalked considerably beyond R^1, anastomosing at a point or connected by a very short bar with C; lines (rows of white dots slightly or moderately connected) with the spots at hindmargin (or at least the postmedian) enlarged.

Underside with little or no intensification of the terminal line posteriorly on forewing or anteriorly on hindwing; rosy suffusion of forewing very extensive, leaving the costal region green, the terminal and posterior regions more glossy glaucous-bluish; hindwing in the ♂ predominantly of the latter tint, with indistinct rosy postmedian line, in the ♀ with the rosy suffusions extended, the line lost.

Jaragua do Sul, Santa Catharina, September 1932, 3 ♂♂, October 1932, 1 ♀ (F. Hoffmann), all in Tring Mus.

A smaller, discoloured ♀, with non-pectinate antenna and shorter tail to the hindwing (Jaragua do Sul, August 1927) may be provisionally regarded as a race of *subrufescens* (Warr., 1906).

SUBFAM. **LARENTIINAE.**

2. **Euphyia eolinda** sp. n.

♀, 28 mm. Face smooth, somewhat rounded (group *Anapalta* Warr.). Palpus short, slightly rougher-scaled than in *violetta* (Warr., 1904), about as in *planilineata* (Warr., 1901). Thorax with the posterior tufts and the pair of spots immediately behind them conspicuously blackish, as in the allies.

Forewing with the colour-scheme almost exactly as in *violetta*, but darker than in the darkest known examples of that species; subbasal band not straightish edged as in *violetta*, but with outward projections in cell and behind SM^2; central band proximally a little more excavated at both folds than in that species, distally shaped almost as in it, or slightly intermediate towards that of *planilineata*; the violet of distal area suffusing with the dark parts of termen, somewhat reducing the olivescent admarginal spots; terminal blackish spots heavier than in *violetta*.——*Hindwing* much darker than in the allies, drab to cinnamon-drab, suffused with grey; cell-mark moderately strong, the irregular dark subterminal and a pale distal edging thereto faint, anteriorly almost obsolete.

Both wings beneath rather pale fawn, slightly suffused (especially the forewing) with grey as far as the postmedian, which is complete on the hindwing,

considerably more proximal before the outward projection of cellule 3 than behind ; both wings with slightly elongate cell-mark.

S. Brazil : Neu Bremen, Rio Laeiss, Santa Catharina, June 1931 (F. Hoffmann), type in coll. Tring Mus.

3. **Eois lilacea telegraphica** subsp. n.

♀, 24 mm. Both wings with the terminal yellow area appreciably narrower than in *l. lilacea* (Dogm., 1909, Colombia to Peru), hindwing with two lines instead of one on the lilacine area, the darker line which bounds it consequently much more distally placed, crossing SC^2 and R^1 near their middle (instead of near their base) and R^3 and M^1 near their base (instead of crossing their stalk).

Jaragua do Sul, Santa Catharina, October 1932 (F. Hoffmann), type ♀ in Tring Mus.

Although I have before me only ♂♂ of *l. lilacea*, their general constancy, the improbability of sexual variation in the group and the wide geographical isolation of the new form leave no reasonable doubt as to its racial validity.

4. **Eois lucivittata brasiliensis** subsp. n.

Forewing with the two postmedian lines less closely approximated than in *l. lucivittata* (Warr., 1907), the proximal one more acutely angled near costa, the distal often weak, sometimes almost obsolete, never with the accentuation between R^3 and M^1 which is generally characteristic of *l. lucivittata*.——*Hindwing* with second postmedian farther from first than on forewing, first subterminal almost as near termen as on forewing, whereas in the other races it appears as a continuation of the second (or even of the first) postmedian.

Jaragua do Sul (F. Hoffmann) type ♂ and 7 ♀♀ ; Alto da Serra, São Paulo (R. Spitz), 1 ♂, 3 ♀♀ ; all in Tring Mus. Also from Petropolis and Alto da Serra in Brit. Mus.

The only two examples of *carmenta* (Druce, 1892, as "*Acidalia ?*") which I know are small, worn and uncertain, but probably provide the oldest name for a collective species which will include *lucivittata*.

5. **Eois chione** sp. n.

♂♀, 20–22 mm. In shape, coloration and general effect near *golosata* (Dogn., 1893).——*Forewing* with areole wanting (in *golosata* present, at least generally) ; postmedian band (partly confluent lines) quite as in that species ; the anterior rows of spots also similar, but rather smaller and on the whole less rounded, the clear yellow space between them and the postmedian generally a little broader ; subterminal spots fairly large, making a double row from costa to R^1, sometimes double again on R^3 and M^1, always single on R^2, M^2 and SM^2 ; a slender series of metallic dashes close to termen (as in *canariata* [Dogn., 1903], etc.) and slighter ones—sometimes punctiform—on termen.——*Hindwing* marked similarly to that of *golosata*, the two postmedian (median) lines rather thick from DC^3 or stalk of R^3—M^1 to abdominal margin, in the type ♂ almost confluent (band-like) ; subterminal (or postmedian) much as in *golosata* but with at least one duplicating dot, which stands between R^3 and M^1 in the bay formed by the deep outward curve of the main series ; terminal and adjacent series as on forewing.

Brazil: Alto da Serra (R. Spitz), type ♂; Jaragua do Sul (F. Hoffmann), 5 ♀♀; all in coll. Tring Mus.

It is not inconceivable that this may be a race of *margarita* (Dogn., 1911), paler and with all the markings slenderer.

6. **Eois mictographa** sp. n.

♂♀. 23 mm. Close to *camptographata* Prout (1922), which it evidently represents in S. Brazil; ♀ antenna equally strongly pectinate. Fillet whiter (scarcely tinged with yellow); occiput purplish fuscous.

Wings slightly more rounded than in *camptographata*, the markings purplish fuscous in varying intensity, nowhere reddish.——*Forewing* with the proximal area darkest in and behind the cell, the two outward projections placed as in *camptographata* (at base of R^3—M^1 and at SM^2) but stronger, on account of a lengthened inward projection of the ground-colour between them; the two postmedian lines better separated than in *camptographata*, nowhere confluent, their outward curve not quite so extreme.——*Hindwing* likewise with the postmedian lines well separated throughout; subterminal line with a thickening (projection outward) at R^3, and more slightly between this and M^1.

Jaragua do Sul, Santa Catharina (F. Hoffmann), a pair in Tring Mus.

SUBFAM. **GEOMETRINAE.**

7. **Pero dichomenis** sp. n.

♂, 36–39 mm. Near *plenilunata* (Warr., 1904, as *Pergama*), with which Mr. Warren confused it. Smaller.——*Forewing* relatively shorter, termen less oblique and with only a very slight tooth at R^1 (in *plenilunata* a moderate one); median area less uniform, the oblique orange patch from costa suffusing a more extended area, usually so bright in the apex of the cell as to suggest a union of the yellow mark of *coronata* (Warr., 1904, as *Azelina*) with that of *plenilunata*; the grey, black-ringed spot outside the cell as a rule slightly narrower (more oval), but not quite constant; postmedian line a little more proximally placed than in *plenilunata*, its inward curve between R^2 and fold generally more perceptible, though still very slight; distal area somewhat paler and more ochreous than in *plenilunata*.——*Hindwing* with postmedian slightly more proximal and more sinuous than in *plenilunata*, the ochreous tornal blotch with the same colour distinction as that of forewing and separated proximally from the ground-colour by a broader white line.

Carabaya, S.E. Peru: Santo Domingo, 6,000 feet, 5♂♂, including the type; La Croya, 3,100 feet, 1 ♂; all in Tring Mus., collected by G. Ockenden.

P. d. derogata subsp. n. A little smaller still (32–34 mm.); forewing with the dark parts a little darker and less reddish, the distal area paler and less bright; hindwing duller, the proximal part darkening distally towards the abdominal margin, the ochreous tornal part paler, shading rather indefinitely into the greyish apical part, the dark subterminal dots (before and behind M^2) very small (in *d. dichomenis* moderate).

Brazil: Alto da Serra, São Paulo (R. Spitz), type ♂: Jaragua do Sul, Santa Catharina (F. Hoffmann), 1 ♂; both in Tring Mus.

8. **Pero hoffmanni** sp. n.

♂, 28–30 mm.; ♀, 34 mm. In size and general aspect similar to *ligera* (Schaus, 1901). Antenna of ♂ more slender. Both wings with termen appreciably more dentate, the angle at M^1 of forewing (behind a rather deep concavity) more acute.——*Forewing* browner, coloured more like *saturata* Walk. or—especially in ♀—with more ochreous admixture; postmedian line anteriorly much more irregular, forming a small outward tooth behind SC^5 and a large one behind R^1, a sharp indentation between them (at R^1); the dark-grey shading just outside the postmedian strong from R^3 or M^1 hindwards, gradually broadening so as to reach tornus (as in *lustraria* Guen., *saturata* Walk., etc.).——*Hindwing* more as in *ligera*, the postmedian line more distally placed, the bright-brown hindmarginal shading generally strong.——Underside with slightly sharper contrasts than in *ligera*.

Jaragua do Sul, Santa Catharina, September 1932, 3♂♂, October 1927, 1♀ (F. Hoffmann), all in Tring Mus. Also from Petropolis, in the same collection.

9. **Pero (Pergama) arciogona** sp. n.

♂, 37–42 mm.; ♀, 40–47 mm. Very similar to *polygonaria* H.-Sch. (1855), with which it has been confused. On an average rather smaller, at least in the ♀; shape less extreme, particularly in the ♂, where the tooth at M^2 of the forewing is wanting or absolutely vestigial; forewing on an average darker, at least than in the Brazilian forms of *polygonaria*; subbasal line less curved, less oblique outward posteriorly, generally less sharply black-mixed; strigulation of median area less strong and regular; the two cell-dots more minute; postmedian line less incurved in the middle, generally rather more definite; shade outside the postmedian on both wings, both above and beneath, not or scarcely diffused.

Brazil: Minas Geraes to Santa Catharina, with *polygonaria*, but generally commoner; type ♂ from Alto da Serra, São Paulo, October 1922 (R. Spitz) in coll. Tring Mus. A smaller ♀ (37 mm.) from Sapucay, Paraguay, in the same collection.

10. **Pherotesia aequilibera** sp. n.

♂, 34 mm. Antennal pectinations moderate. Abdominal tufts undeveloped.

Forewing somewhat shorter and better rounded than in *condensaria* (Guen., 1858); $SC^{1,2}$ short-stalked, DC markedly incurved at cell-fold, oblique outward to R^2 (the "independent" of Guenée), which arises very near R^3, curving away from it (not proximally subparallel); colour and markings about as in *condensaria*.——*Hindwing* with the apical furcation of C strong, DC and R^2 (the "independent") closely as on forewing; colour and markings about as in *condensaria*, cell-dot rather more concise, terminal band scarcely suggested.

Jaragua do Sul, Santa Catharina, December 1927 (F. Hoffmann), 1♂ in Tring Mus.

Apart from the structure—*condensaria* having hindtibial hair-pencil, R^2 of forewing normal, of hindwing in ♂ connate or stalked, etc.—distinguishable at a glance by its much smaller size.

11. **Melanolophia orthotis** sp. n.

♂, 42–45 mm. Head and body concolorous with wings. Hindtibia about 8 mm. long, the pencil strong, mixed with blackish; hindtarsus about 3 mm. Abdomen with pencils concolorous.

Forewing with the stalk of SC^1 and SC^2 short, the former anastomosing shortly with C or (slightly oftener) free ; pale grey, inclining to light greyish olive and with more or less light-brown suffusion, at least between the postmedian and subterminal about R^3 and M^1, outside the subterminal about R^1 and R^2, and in a narrow band-like shading distally to the postmedian ; moderate blackish irroration, becoming closer and more strigulate at costa ; cell-dot black ; lines blackish, more or less overlaid with light brown (slightly cinnamon) ; antemedian with a strong outward projection in the cell ; median straight, from costa at about three-sevenths to hindmargin slightly before middle, generally strong, occasionally feeble ; postmedian almost equally straight, but with slight distal dots or teeth on the veins and a rather stronger tooth on SM^2, between very shallow lunules ; the characteristic pair of dark spots outside the lunules developed ; proximal subterminal spots variable, small, the three between SC^5 and R^3 generally fairly strong ; often a further pair on the subapical brownish cloud ; terminal interneural dots strong in anterior half, weakening behind.——*Hindwing* with C not forked apically ; median line continued, equally straight ; some dusky suffusion outside it ; a small black cell-dot ; postmedian straight from hindmargin to SC^2, here bent, generally weak in front of the bend ; the brown shade outside it often traversed by a weak dark line, duplicating the postmedian at close quarters; outer area much as on forewing, but without the additional cloudings.

Underside pale grey, almost entirely without the brownish admixture ; copious, somewhat nebulous, darker grey irroration, especially on the forewing ; cell-dots sharp ; postmedian present, median traceable ; a cloudy (rather variable) subterminal band, which weakens or becomes almost obsolete on posterior part of hindwing.

Matto Grosso : Burity, 30 miles N.E. of Cuyabá, 11–16 June 1927 (1) and 6 September–22 October 1927 (17), the holotype dated 22–30 September. All collected for the late Mr. J. J. Joicey by Mr. C. L. Collenette.

Close to *modesta* Warr. (NOV. ZOOL., xi. 552, Paraguay) but greyer and with the median and postmedian lines straight.

12. **Odysia isoteles** sp. n.

♂, 37 mm. Similar in structure to the genotype (*molaria* Guen., 1858). Hindlegs lost, but the tibia probably with a vestigial hair-pencil, as the abdomen has a very slender basal spine (I have, however, found such a spine in one example of *molaria*).

Forewing with termen a little more oblique than in *molaria* ♂ ; groundcolour somewhat more clayey, the dark irroration rather sparse ; the black dots, especially the postmedian and subterminal, larger ; median series straightish, well proximal to cell-dot ; the pair at R^3 outside the postmedian strong ; proximal and distal subterminals highly developed at R^2 and posteriorly (at least behind M^2), the proximal also in cellules 7 and 2, the distal in cellule 6.——*Hindwing* very distinct from that of *molaria*, the lines being punctiform as on the forewing (though with distal subterminal obsolete), the postmedian accompanied distally by black spots at R^3 (almost as on forewing), not by a continuous shade or row of spots.

Underside darkened, nearly as in strongly suffused forms of *molaria*, but more irregularly.

Jaragua do Sul, Santa Catharina, September 1932 (F. Hoffmann), 1 ♂ in Tring Mus.

O. molaria occurs in the same locality, in June, July and September.

13. **Hymenomima semialba luteisella** subsp. n.

Differs from *s. semialba* Warr. (1897 ; Amazon—Pebas to Parà—and the Guianas) in having a bright ochraceous-buff (almost orange) saddle at the base of the abdomen. Forewing somewhat darkened, the white central area being more or less suffused with blackish.

E. Peru (from Junin southward) to N.E. Bolivia, the type from La Oroya, Rio Inambari, 3,100 feet (G. Ockenden) in coll. Tring Mus.

In the most typical form the ochreous saddle is particularly conspicuous ; in some examples there is also a duller buff suffusion on the next few segments, such as is shown in some *s. semialba* from Fonteboa ; the general racial distinctness, however, catches the eye immediately.

14. **Hymenomima pristes** sp. n.

♀, 28–29 mm. Group of *umbellularia* (Hb. 1825, sec. Guen. 1858) = *inceptaria* (Walk. 1860), antenna similarly pectinate. Crown of head, collar and patagium definitely tinged with buff (white in the form of *umbellularia* from the same locality).

Forewing with antemedian line rather more gently curved than in *umbellularia*, accompanied proximally by an inwardly serrate duplicating line ; median line entirely different from that of *umbellularia*, its costal spot more distally placed than the (slender) cell-mark, its anterior half very strongly excurved, its entire course deeply serrate, the teeth directed inward on the veins ; duplicating line of postmedian slender, but strong, its outward teeth pronounced ; subterminal slender, sharply dentate, not interrupted, the spot in cellule 3 connecting it with the white of the termen very slight or obsolete ; terminal black dots connected by a fine line.——*Hindwing* with similar distinctions.

Underside much as in dusky, dark-bordered *umbellularia* or *camerata* Warr. (1900).

Jaragua do Sul, Santa Catharina, August–October (F. Hoffmann), 4 ♀♀ in Tring Mus.

Hübner's figure of *umbellularia* is not altogether convincing and has given rise to many uncertainties, but I know of no better claimant than Guenée's (*Spec. Gén. Lép.* ix. 258), which must of course be provisionally accepted.

15. **Hymenomima seriata** sp. n.

♂, 26 mm. Group of the preceding.

Forewing with the markings perhaps nearest those of *camerata* Warr. (1900) = *schisticolor* Warr. (1904), the lines being without duplications ; blurred greywhitish, as in the least clear *camerata* ; very distinct in that the lines are entirely macular ; antemedian anteriorly very oblique, the spot on M fairly large, that which bounds the fovea small ; median consisting of two rather large spots, the first on M and base of M^2, the second on SM^2 ; postmedian series wedge-shaped, curved, but much less so than in the allies, arising little beyond the cell-spot ; subterminal series large, confluent ; terminal series less large, less confluent ;

cell-spot broader and less lunular than in most *camerata*.——*Hindwing* with similar distinctions, the subterminal spots less confluent than on forewing.

Underside similar to that of *camerata*.

Colombia: Cananche, Cundinamarca, September 1903 (M. de Mathan), type ♂ in Tring Mus. A rather smaller but quite similar ♂, in poor condition, from Santo Antonio de Javary, Upper Amazons, May 1907 (S. M. Klages) in the same collection.

16. **Herbita (Ira) hypolizon** sp. n.

♂, 48–52 mm. Head and body grey, with some olive-brownish suffusions. Antenna with serrate teeth, bearing tufts of short ciliation.

Forewing with termen just appreciably bent at R^3, otherwise shaped as in the closely similar but generally larger *capona* Dogn. (1900);[1] markings almost as in that species, but the brown suffusions weaker and generally much less extended, the straight line between cell-dot and postmedian much less firm, often diffuse or almost obsolete, the postmedian more oblique from SM^2 to hindmargin.

E. Peru: Huancabamba, Cerro de Pasco (E. Böttger), 13 ♂♂ in Tring Mus., including the type. Also from Oxapampa, N. Peru.

The ♂ antenna in the so-called *capona* of Huancabamba is definitely, though very shortly, pectinate, the branches almost 1; Dognin's description of those of type *capona* as "crénelées, à double rangée de cils courts et épais" might point to a race of the present species rather than of the ally with which I have compared it.

17. **Trotopera olivifera** sp. n.

♂, 46 mm.; ♀, 50 mm. Intermediate between *maranharia* (Feld., 1875; cfr. Warr., Nov. Zool., i. 456) and *arrhapa* (Druce, 1891), the posterior half of the termen in the ♂ very faintly, in the ♀ moderately crenulate, the hindwing in the ♂ at least as strongly crenulate as in the ♀ of *arrhapa*, in the ♀ almost as extreme in shape as that of *maranharia*. Purple, the bar at extremity of costa and subterminally from about M^1 to hindmargin with browner, somewhat olive-mixed clouding, the hindwing with a much broader distal suffusion, reaching costa outside the postmedian and termen from about M^1 to tornus, leaving a more or less narrow terminal patch of the ground-colour in anterior half of wing; both wings with a yellowish-olive patch, that of forewing ill-defined, running from base of cellule 3 about to SM^2, that of hindwing stronger, commencing at radial fold just outside the postmedian, gradually broadening (but with its distal edge crenate) so as almost to reach tornus at its hinder end; markings as in the species named, the forewing with the three white vein-dots, which represent the antemedian as strongly developed as in *arrhapa* and the white costal spot at the commencement of the outer line even more so.——Underside purple-grey, marked as in *arrhapa*, but almost entirely without the redder admixture in the distal area which is generally well developed (at least on forewing apically) in that species.

Jaragua do Sul, Santa Catharina, August and September 1932 (F. Hoffmann), a pair in excellent condition in Tring Mus.

[1] I have not seen the species from Espiritu Santo, Brazil, the type locality, and have to compare the Huancabamba race (or close relative) which was consistently determined by Warren as *capona*, probably in accord with Dognin, and which agrees very well with the type description, except that I should call the strong suffusions of the forewing olive-brown rather than greenish.

A race (?) occurs at St. Jean de Marani, the ♂♂ almost indistinguishable from *olivifera*, the ♀♀ small and without the yellowish-olive patches. As I do not feel quite certain of the mating, I defer naming it.

18. **Drepanodes semibrunnea** sp. n.

Pyrinia semibrunnea Warr. M.S., in coll. Tring Mus.

♂, 34 mm. Face white, a small upperpart grey. Palpus short, whitish, especially beneath. Antenna simple. Vertex grey ; occiput ochreous. Thorax and abdomen pale yellow, the extreme front of thorax marked with empire yellow. Hindtibia with slender pencil.

Forewing with costa arched, apex strongly falcate, the falcation blunt at its tip, tornus almost rectangular ; $SC^{1,2}$ very long-stalked, their stalk arising from base of that of SC^{3-5}, anastomosing rather strongly with C (or by obsolescence of base appearing to arise out of C), SC^{3-5} extremely long-stalked ; straw yellow ; costal edge warmer ; a minute dark cell-dot ; a very ample distal suffusion of dull brownish vinaceous, nearly reaching the cell-dot, its proximal edge inangled at R^3, its apical part suffused with dark grey, some remnants of the yellow ground-colour at tornus ; a pecan-brown line from nearly three-fifths hindmargin, running fairly straight towards apex, becoming finer and weaker, bearing a small white dot on R^1 and a second on SC^5, where it is presumably sharply angled, its costal extremity being marked by a less small and more proximally placed white dot ; fringe darkened and reddened.——*Hindwing* with costa somewhat curved, apex and tornus well developed, termen not very convex, abdominal margin fairly long ; as forewing, but with the pecan-brown line more proximal, the suffusion on which it stands band-like, about 1 mm. broad proximally to the line, 2 mm. distally ; fringe yellow ochre.

Underside pale yellow, the forewing with minute dark cell-dot, both wings with broad blackish band, that of hindwing central, at least 3 mm. in width, its continuation on forewing starting wide, narrowing to costa near apex, but on most of its course (except hindmarginally) accompanied by some red-brown suffusion.

Upper Amazons : Fonteboa, May and August 1906 (S. M. Klages), 3 ♂♂ in coll. Tring Mus., including the type. Also in the same collection 1 ♂ from Calama, Rio Madeira, and 1 ♂ from Palcazu (Dept. Junin), Peru.

Group of *pholata* Guen. (1858), the upperside suggesting a larger, duller version of *formosa* Warr. (1904, as *Pyrinia*) but the wing-shape much nearer to that of *humerata* (Warr., 1905) = *icaria* Oberth. (1912).

19. **Pyrinia chrysoclaba** sp. n.

♂, 23 mm. Head and body above hazel to russet, beneath predominantly yellow and orange. Antennal joints slightly projecting, cilia very short. Palpus little over 1.

Wings shaped nearly as in *mimicaria* Walk. (1862 = *apriata* Feld.), the costal margin of the forewing slightly rounder still.——*Forewing* red-brown, brightest (more sienna) anteriorly, with a large wash of light orange-yellow outside the cell (roughly between SC^4 and R^2 or R^3 and extending narrowly to apex) ; costal edge narrowly olivaceous, mixed with grey ; ante- and postmedian bands of pale vinaceous-drab from hindmargin at one-third and scarcely two-thirds, more oblique than termen, each containing an indistinctly darkened line ; antemedian

sharply angled in cell, but weak at the angle, resumed as an ill-defined spot at nearly one-third costa ; postmedian a little curved, narrowed abruptly after reaching R^3, thence very slender and near termen, running to a black dot on costa ; a subterminal line of the same colour from hindmargin to R^2 or R^1.—— *Hindwing* with more definite red-brown longitudinal striation on a pale ground (blended buffish and vinaceous) ; costal margin mainly cream-buff ; postmedian band and its line continued, broad throughout, almost parallel with termen ; subterminal broadened, band-like, complete.

Forewing beneath with the anterior yellow brighter and cleaner, costally extended almost to base, with a red-brown antemedian spot and a brown subterminal one (larger, but less black than the dot of upperside) ; a light vinaceous-drab subterminal band, recalling that of hindwing above ; ill-defined longitudinal suffusions in posterior half of cell and between M (— M^2) and submedian fold, slightly more purple-drab ; hindmargin pale. Hindwing beneath more orange than above, well strigulated, but with the lines indefinite, excepting a very fine dark subterminal, parallel with termen, strongest anteriorly.

Jaragua do Sul, Santa Catharina, October 1930 (F. Hoffmann). Type in coll. Tring Mus.

Probably related to *mimicaria*, but larger and in many respects very distinct, the pose of the pale markings in some ways more suggestive of *optivata* (Guen., 1858).

20. **Aplorama nazada plusia** subsp. n.

♂, 52 mm. Considerably larger than *n. nazada* (Druce, 1892, as *Byssades*), hindwing with the yellow markings bright (cadmium) and much extended, the outer curved stripe (from subtornal patch to SC^2) being broad and strong, a complete terminal stripe developed (reaching C anteriorly), the underside of this wing also showing some yellow, namely the subtornal patch from tornus to R^3 and some suffusion on the fringe from R^1 to apex.

Cuba : Loma del Gato, 2,500 feet, Sierra Maestra, July–August 1929 (Father H. F. Clement), 1 ♂ in Tring Mus.

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NOVITATES ZOOLOGICAE

Vol. XXXIX. DECEMBER 1934. No. 2.

NEW SPECIES AND SUBSPECIES OF GEOMETRIDAE.

By LOUIS B. PROUT.

Subfam. **OENOCHROMINAE**

1. **Petovia niphosphaeras** sp. n.

♀, 36 mm. Face blackish, becoming paler below. Vertex and antenna blackish. Thorax in front capucine yellow, above —especially on tegula—largely rufous, mixed with orange, beneath orange-yellow. Abdomen buff-yellowish, above mixed with rufous. Legs olive-brown.

Forewing considerably broader than in typical *Petovia*, termen much less oblique ; cell ½, DC not exceptionally oblique, SC^1 anastomosing with C and with SC^2 ; bright vinaceous rufous, approaching English red ; a black costal edge, at base very narrow, widening a little, at about 6 mm. meeting an extremely broad black border, whose proximal edge runs very obliquely (but with an outward projection in posterior-distal end of cell) to fold at 3 or 4 mm. from termen, thence oblique inward ; a large white apical patch between costa and R^2, anteriorly and distally somewhat rounded so as to recede slightly from costa proximally and from termen posteriorly ; a much smaller subterminal white spot only separated from it by R^2.——*Hindwing* broader than in typical *Petovia*, DC^3 less extremely oblique ; coloured like forewing, excepting costa ; border not oblique-edged, about 4 mm. wide ; apical white spot oval or slightly reniform ; posterior white spot vestigial.

Underside the same.

Tanganyika Territory : Ukami. Type in coll. Brit. Mus.

A strikingly distinct species, apparently entering the same mimetic association as *Aletis*, but structurally agreeing with *Petovia* except in the details noted above.

2. **Achlora micraulax** sp. n.

♂, 35 mm. Almost exactly like a rather brightly coloured *cuprinaria* Guen. (1858). Palpus more reddish on outerside. Antennal pectinations considerably shorter (only about 2). Hindwing with M^1 barely stalked; beneath with the ridges of hair extremely small (so that they might easily be overlooked but for their light brown colour), separated by a small furrow behind M^2. Forewing with apex scarcely so acute as in *cuprinaria*. Both wings with the terminal dots more

sharply black, though minute, the fringes proximally rather brighter rose-colour, distally rather pale, but not so whitish as in *cuprinaria*. Cell-dot of hindwing large, but not more so than in occasional *cuprinaria*.

Matto Grosso: Burity, 30 miles N.E. of Cuyabá, 2,250 feet, at human perspiration, 16–22 October 1927 (C. L. Collenette), type in coll. Tring Mus.

3. **Ergavia oenobapta** sp. n.

♂, 33 mm. Head and palpus mixed with blackish, the head with some white scaling. Antenna with short pectinations (about 2). Thorax and abdomen dark above, pale beneath. Hindtibia with one spur.

Forewing rather elongate, costa straight to near apex, termen oblique, in posterior half strongly so; areole wanting; subbasal raised scaling slight; ground-colour pale, obscured by heavy blackish-fuscous irroration, in part (except distally) relieved with a sprinkling of silvery scales; veins and distal area suffused with deep brownish vinaceous and dark vinaceous brown (Ridgway, pl. xxxix); markings blackish fuscous, consisting of the moderate, raised cell-spot, costal dots and dashes and the usual three lines; antemedian thick in its anterior half, strongly outbent in cell; median shade ill-defined, irregular, near the postmedian, apparently touching it at base of M^2, strongly outbent in its anterior half; postmedian thick, still more strongly outbent: arising at $\frac{3}{5}$ costa, it runs obliquely outward to a rather long tooth on R^1, curves inward between this and a long, slightly bifid prong at R^3–M^1, again inward (very steeply) behind M^1, almost touching M at the origin of M^2, and making a small outward projection at SM^2; whitish subterminal spots (large dots), three anterior ones the strongest; terminal dark line not very intense; lines on fringe weak.——*Hindwing* concolorous with forewing, a little paler at base of costa and almost without silvery scales; cell-spot and distal area much as on forewing; median shade indicated, especially in posterior part, touching the cell-spot on its proximal side; postmedian very much less irregular than on forewing, only with weak sinuosities in corresponding positions.

Underside mostly suffused with slightly vinaceous fawn, the costal margin of the forewing browner and with blackish-fuscous strigulation; both wings with short blackish cell-streak, lines wanting, apical region vaguely dark-suffused.

Matto Grosso: Burity, 30 miles N.E. of Cuyabá, 2,250 feet, at light, 6–21 September 1927 (C. L. Collenette), type in coll. Tring Mus.

Easily distinguished from *exstantilinea* Prout (1932) by its structure, still more extreme postmedian line, vinaceous tone and almost unmarked underside.

SUBFAM. **HEMITHEINAE**

4. **Mimandria cataractae rhusiodocha** subsp. n.

♂, 32 mm.; ♀, 42–46 mm. Greener than *M. c. cataractae* Prout (1917), forewing with SC^1 stalked, (in *cataractae* type connate), both wings with complete, though unequal, series of *red* spots outside the postmedian, underside in ♂ weakly marked.

Kenya: ♂ type and 2 ♀♀ from Kibwezi, 1 ♀ from Makindu, S. of Nairobi; all in coll. Tring Mus. (W. Feather).

5. **Xenochroma palimpaïs** sp. n.

♀, 28 mm. Head and body mostly concolorous with wings, face more red-brown, front of thorax white ; antenna shortly pectinate.

Forewing with costa very little curved, apex prominent, termen anteriorly straight or very faintly convex, little oblique, a pronounced angle at M^1, posterior part highly oblique, faintly sinuous, tornus rather pronounced ; M^1 stalked ; pale brownish vinaceous, with fine and rather sparse brownish irroration ; costa proximally whiter ; lines brownish, with a tinge of olive ; antemedian from $\frac{1}{3}$ costa to somewhat less than $\frac{1}{2}$ hindmargin, anteriorly curved, posteriorly straight ; postmedian at well beyond $\frac{2}{3}$, weakly lunulate-dentate ; some small and irregular terminal dots or dashes between the veins ; fringe white proximally, more vinaceous distally.——*Hindwing* subquadrate, the apex, tornus and angle at M^1 pronounced ; M^1 well stalked ; concolorous with forewing ; postmedian less continous, more bent at M^1 than on forewing ; no appreciable terminal marks ; fringe as on forewing.

Underside whiter, almost unmarked ; tips of fringe suffused with pale vinaceous.

Nigeria : Gadau, 12° N., 10° E., February 1913 (Buxton and Lewis), type ♀ in coll. Brit. Mus., presented by the discoverer.

Combines nearly the shape of *candidata* Warr. (1902) with nearly the colouring of *dyschlorata* (Warr., 1914).

6. **Agathia ichnospora** sp. n.

♂, 34 mm. Face rosy above, whitish below. Palpus rather slender and smooth-scaled, with third joint unusually long for an *Agathia* ♂ ; pale, with upper- and innerside red. Head and front of thorax above green, somewhat mixed with white, thorax behind largely dull vinaceous ; abdomen with some green admixture above (somewhat discoloured). Legs pale ; hindtibia with rather strong pencil, but with the terminal process slight.

Forewing with costa well arched at base and near apex, termen straight, less oblique than in most *Agathia* ; scale-flap to cell beneath (from proximal part of M) well developed ; bright yellowish green (about " mineral green " of Ridgway) ; costal edge pale purplish vinaceous, with less pale vinaceous speckling ; markings dark reddish brown, greatly reduced ; a rather small spot in apex of cell, succeeded posteriorly by some transverse dashes which represent a sinuous line (excurved between the spot and M, incurved between the base of M^2 and fold) ; a postmedian series of interneural dots or small spots between SC^5 and SM^2, slightly excurved in its anterior half ; fringe green, somewhat mixed with white, and with elongate dull-red marks opposite the veins.——*Hindwing* with the tail very small, but pronounced, the termen on either side of it almost straight ; a pair of small blackish spots in tail ; a postmedian series of spots much as on forewing, but with an acute indentation between R^3 and M^1 ; fringe as on forewing.

Underside very pale greenish, shading between sea-foam yellow and deep sea-foam green ; forewing with much smoky (slightly greyer than benzo-brown) suffusion costally and strigulation in and to considerably beyond cell (densest in cell) ; both wings with a rather thick postmedian line (about midway between the two lines of the forewing above) ; fringe-marks smaller than above, smoky, not reddish.

" Boin Island," 5 August 1932 (H. Ise), type ♂ in coll. Prout, kindly presented by Mr. K. Fujimatsu, of the Gifu College of Agriculture, who has a paratype.*

A strikingly distinct species.

7. **Tanaorhinus kina embrithes** subsp. n.

Maculation beneath much heavier than in *k. kina* Swinh. (1893), forming on the hindwing an uninterrupted though irregular band, which at M^2 generally attains a width of fully 4 mm.

Sikkim: Gopaldhara, 3,440–3,800 feet (H. Stevens), 10 ♂♂ and 1♀ in Tring Mus.

8. **Neromia aphthona** sp. n.

♂, 26 mm. Hindlegs lost, but the near relationship to *rhodomadia* Prout (Ann. Transv. Mus. viii. 150) so obvious that the systematic position cannot be doubted. Distinguishable as follows.

Forewing with costa more broadly white, at base with little trace of red or black scaling; basal patch and cell-dot wanting; fine white lines well developed, the antemedian straight, the postmedian unusually proximal, slightly excurved at first, then almost straight; terminal blotches enlarged, an additional one (very small) present between SC^5 and R^1, the tornal with an irregular green centre, round which is some suffusion of ochreous- and reddish-brown, then the pale part.——*Hindwing* with corresponding distinctions, the tornal blotch with some green scaling in its centre, the single line scarcely beyond the middle of the wing, curved or bluntly bent after crossing the bases of R^3 and M^1.

Uganda: Kalongo, 9 July 1933, at light (H. B. Johnston), type in Brit. Mus., received through the Imperial Institute of Entomology.

The specimen has died with the genitalia rather well opened; the general agreement with *rhodomadia* is borne out, notably by the large and very strong thorn on the valve, and it is possible that a fuller investigation may give to *aphthona* the status of a subspecies.

9. **Syncollesis tiviae** sp. n.

♂, 26 mm. Face and palpus white in lower part, black mixed with red in upper. Vertex narrowly white, occiput green. Antenna with the pectinations rudimentary, less than diameter of shaft. Body green above, whitish green beneath.

Forewing anteriorly more rounded than in *idia* Prout (1931); venation nearly the same, R^2 arising still closer to R^1; ground-colour of almost the same vivid green; postmedian line less whitish and not appreciably dark-edged proximally, only very slightly paler and more glaucescent than the ground-colour, its course different in that it is decidedly curved, approximately parallel with the termen throughout; extremely faint indications of a similarly coloured antemedian placed about the end of the cell and strongly outbent in the middle; fringe (as in *idia*) green with white tips.——*Hindwing* concolorous, costally and at base perhaps slightly more whitish, a rather strongly curved postmedian faintly indicated.

Underside similar, but not quite so uniform, the forewing becoming a trifle paler posteriorly and distally; the postmedian line (or rather, its proximal edge) faintly suggested in darker green.

* I wrote to Mr. Fujimatsu many months ago for further elucidation of the locality, but have not yet received his reply.

N. Rhodesia : Ndola, April 1930, type ♂ in coll. Tring Mus., received from my friend Mrs. Tivy, to whom I dedicate the species.

The shorter antennal pectinations and rounder forewing prevent our regarding this as a race of *idia*.

10. **Comostolopsis tmematica** sp. n.

♀, 27 mm. Near *leuconeura* Prout (1930, Réunion), larger. Face light red. Body and wings lighter and more yellowish (only a tinge bluer than deep greenish glaucous of Ridgway), white vein-markings rather broader, cell-dots wanting, postmedian line not dentate, on the hindwing strongly excurved between radial and submedian folds.

Uganda : Birunga Mountains, February 1933 (G. L. H. Hancock), 2 ♀♀ ; type in Brit. Mus., received through the Imperial Institute of Entomology.

Subfam. **STERRHINAE**

11. **Dithecodes inornata aniara** subsp. n.

♂♀, 26–30 mm. Smaller and darker than *i. inornata*, the irroration stronger and more reddish, perhaps more copious, the band outside the cell less broad, nearly always resolvable into two approximated lines, or a line succeeded by a narrow shade, the pale terminal dots at vein-ends (overlooked by Warren) stronger.

E. Java : Nongkodjadjar, 4,000 feet, August–December 1933 (A. M. R. Wegner), a long series in coll. Tring Mus.

Warren's description of " *Rhodostrophia* " *inornata* (Nov. Zool., iii. 379) is poor, probably written by artificial light. The type is pinkish-buff to fawn (i.e. not like any colour in Ridgway, but certainly not " mouse-colour "), the antemedian line twice outbent, the red parts of underside confined to the ♂ (dense specialised scaling), the ♂ pectinations rudimentary, bearing long fascicles, the leg characters typical of *Dithecodes*, the distal areole at times minute or even wanting.

12. **Traminda drepanodes f. rhodea** (form. nov.)

♀, 36 mm. Differs strikingly from typical *drepanodes* Prout (1915) in its very dissimilar coloration, possibly also in the slightly less produced apex of the forewing and (?) less strongly darkened fringes, in which case it may prove a separate species ; but as the margins are somewhat damaged, I prefer to regard it as a remarkable modification of the species named. Forewing and hindwing above deep (somewhat dark) vinaceous, only with their costal margins respectively pale cream-buff and whitish ; cell-mark smaller than in typical *drepanodes*, the oblique stripe broadly pale cream-buff, bordered proximally with narrower olive-shaded brown stripe. Underside almost typical, rather weakly marked.

Uganda : Kisaru, 25 June 1933 (H. B. Johnston), type in coll. Brit. Mus., received through the Imperial Institute of Entomology.

13. **Ptochophyle bradyspila** sp. n.

♂, 22 mm. Head and body predominantly dull purplish, the body beneath paler, the abdomen with some blackish admixture on sides.

Forewing with costa slightly arched at base and near apex, almost straight between, apex moderate, termen smooth, gently curved, not very strongly

oblique, tornus well expressed ; areole fairly large, SC^1 from its apex ; brownish drab ; a minute black cell-dot ; an indistinct, rather strongly excurved grey postmedian line traceable from costa to behind M^1, passing about midway between cell-dot and termen ; a rather thick, but not very sharply defined, dark terminal line ; fringe orange-yellow, red-mixed proximally.——*Hindwing* with termen rather full, but not definitely bent at R^3 ; concolorous with forewing ; cell-mark larger, elongate ; a large, composite black spot between bases of R^2 and M^2 ; two slender, curved, subpunctiform dark lines between cell-mark and termen ; terminal shade broader, but (at least proximally) less intense than on forewing ; fringe as on forewing.

Underside paler, without definite markings ; hindmargin of forewing and a terminal line on both wings whitish ; fringes orange-yellow.

Madagascar : Station Perinet, 140 km. E. of Tananarivo, January 1933 (Mme. N. d'Olsoufieff), type ♂ in coll. Tring Mus.

14. **Ptochophyle callichroa** sp. n.

♂♀, 22–25 mm. Similar to *anthocroca* Prout (1925), but with the termen of the forewing slightly less oblique, that of the hindwing decidedly less angled at R^3, the rosy purple colour—especially in the ♀—very greatly predominating. Abdomen above purple, with only narrow (in the ♀ extremely narrow) and more or less interrupted mid-dorsal yellow markings, the yellow on the wings in the ♀ reduced to very slender interrupted strigulae or dots, in the ♂ to broader and more continuous zigzag lines or streaks, but still considerably narrower than the purple parts ; in the ♂♂ the broadest yellow markings of the forewing are an extremely angular antemedian (oblique outward from costa to base of M^2, inward and slender to fold, outward to hindmargin) and two somewhat less extremely zigzag postmedian (the first with its sharpest angle outward behind R^3, the second slenderer and more interrupted, in any case with a strong angle outward in front of R^1) ; the last yellow marking in both sexes consists of a rather regular series of interneural spots or large dots close to termen. Underside paler, the hindwing with much of the purple marking slight and shadowy, so as to give the yellow tone a preponderance.

Madagascar : Station Perinet, 140 km. E. of Tananarivo, December 1932 and January 1933 (Mme. N. d'Olsoufieff), 3 ♂♂ and 4 ♀♀ in coll. Tring Mus.

15. **Ptochophyle phanoptica** sp. n.

♂, 24–26 mm. Face and outerside of palpus rosy. Vertex and scaled area of antenna white. Occiput and front of thorax variegated with ochre, purple-grey and roseate ; thorax posteriorly and part of abdomen ochre to yellowish above, abdomen above with a very large central blotch, connected with a smaller posterior one, purple partly mixed with dark grey ; underside of body pale cream-buff. Fore- and midleg partly rosy.

Forewing not very broad, costa straightish, termen slightly bowed, oblique ; ground-colour pale cream-buff, smooth and slightly translucent (almost as in the ♂ of *togata* Fb., 1798) the veins finely yellower ; base concolorous with thorax ; costal and terminal areas yellow, mixed with bright ochre ; cell-dot very small, black ; markings grey, tinged with olive, "fluted" as in some *Glossotrophia* species, forming three ill-defined bands ; first slight, adjoining the basal clouding ;

median broad, just proximal to cell-dot, attenuated or almost interrupted in the middle ; outer moderate, somewhat sinuous, bounding the yellow terminal area proximally ; additional markings, partly grey, partly rosy, anteriorly and posteriorly, connecting the second and third bands ; and again, anteriorly, medially and posteriorly, clouding the terminal area ; fringe pale yellow.—*Hindwing* with termen very bluntly angled at R^3 ; basal patch only represented by a rosy mark in base of cell ; cell-dot minute ; first two bands wanting ; instead, a long purple patch (mixed with dark grey) at abdominal margin, commencing in a point at about $\frac{1}{5}$ but widening rapidly, distally reaching a small yellow terminal patch ; third grey band mixed with rose-colour, especially at costa, about 2 mm. wide, almost (in middle quite) reaching termen.

Underside pale, with the markings vague, predominantly grey ; costal purple markings of forewing strengthened.

♀, 29 mm. Head, body, costal area of forewing and distal areas as in the ♂ ; forewing with the cell-dot ; antemedian and median bands joined into a solid grey area ; area between cell and outer band almost entirely occupied by a broad rosy band ; hindwing with the cell-dot less small, the proximal and post-cellular areas as on forewing.

Madagascar : Station Perinet, 140 km. E. of Tananarivo, January 1933, 5 ♂♂, December 1932, 1♀ (Mme. N. d'Olsoufieff), all in coll. Tring Mus.

16. **Ptochophyle neurina** sp. n.

♀, 27 mm. Face and palpus reddish. Fillet white. Vertex, thorax and abdomen concolorous with wings.

Forewing fairly broad, triangular, margins straightish ; purplish grey inclining towards vinaceous, at termen deep purplish grey ; costal and distal edges, some irroration and most of the veins yellow ; lines yellow, antemedian angled at cell-fold, thence straight, postmedian excurved in the greater part of its course ; fringe whitish buff.——*Hindwing* with termen somewhat convex, not angled at R^3 ; slightly redder, terminally darkened ; markings similar, the antemedian straight.

Underside much paler, except on forewing anteriorly ; lines traceable.

Madagascar : Station Perinet, January 1933 (Mme. d'Olsoufieff), 1♀ in coll. Tring Mus.

17. **Ptochophyle nasuta** sp. n.

♀, 24 mm. Head, thorax and abdomen above pallid vinaceous drab, the thorax and abdomen with some red-brown admixture ; face and palpus red-brown.

Wings shaped nearly as in *gnamptoloma* Prout (1925), but both rather less extreme.——*Forewing* with base, costal region (as far as SC^1 and its branches) and an irregular terminal area pallid vinaceous-drab, in places with faint red-brown suffusions or weak markings ; the rest of the wing vinaceous-tawny to testaceous, with some dark irroration or suffusion ; a highly irregular testaceous, distally dark-edged antemedian line discernible ; indications of a dark cell-streak ; postmedian line from about the base of SC^5, forming a large "nose" outwards between its origin and M^1, so as to reach at its extremity about 1 mm. from termen, throughout forming the boundary of the reddish area ; faint brown interneural subterminal spots ; terminal line and base of fringe vinaceous, the former dark-

mixed.——*Hindwing* similarly coloured, but with an elongate white cell-mark, narrower costal and somewhat differently shaped distal area, the postmedian line running straighter and less extremely oblique to its promontory about R^3; antemedian line scarcely indicated.

Underside much more vinaceous and much less variegated, the shades running one into another; some ill-defined greyish clouding tornally on forewing and distally on hindwing; white cell-mark of hindwing distinct.

Madagascar: Station Perinet, December 1932 (Mme. d'Olsoufieff), one ♀ in coll. Tring Mus.

18. **Problepsis violescens** sp. n.

♀, 37–39 mm. Very similar to *achlyobathra* Prout (1928), of which it may well prove to be a race. Body and wings more suffused with violaceous, the forewing less dark-clouded, with the ocellus and its accompanying markings more constricted (more recalling those of *transposita* Warr., 1903) though with the black marks at M^1 more slender), the distal area in consequence broader.

E. Java: Nongkodjadjar, 4,000 feet, December 1933 and January 1934 (A. M. R. Wegner), 2 ♀♀ in coll. Tring Mus.

19. **Scopula suna** Prout. ♂♀.

♂♀, 28–30 mm. Face black, narrowly white below. Palpus black, narrowly pale below. Vertex and antennal shaft whitish, the latter with some dark dots; ciliation scarcely over 1. Thorax, abdomen and legs concolorous with wings, the foreleg infuscated on upper- and innerside; hindtibia dilated, with strong pencil, tarsus short (well under ½).

Forewing fairly broad, termen little oblique in anterior half, thence curving obliquely; whitish buff, with fine and sparse black irroration, the markings weak, somewhat more greyish buff (a little less grey than those of *floslactata* Haw., 1809); slight suffusion on basal 3 mm.; cell-mark weak, an indistinct ocellus: antemedian and median diffuse, more or less lunulate-dentate, the former rather near the cell-mark, the latter considerably beyond the middle and making a strong outward sweep after its subcostal angle inward, thus unusually far from the cell-mark, but behind M^1 strongly incurved, reaching hindmargin scarcely beyond middle; postmedian finer, on an average about 3·5 mm. from termen, lunulate-dentate and with outward projection at SC^5–R^1 and inward curve between R^1 and R^3; subterminal made conspicuous by shades which occupy almost the entire distal area; terminal dots sharply black; fringe pale at base, a slightly darkened bisecting line about the middle.——*Hindwing* with termen faintly crenulate in middle part, the projection at R^3 hardly appreciably stronger than that at M^1; cell-dot small, black; median shade slightly less diffuse than on forewing, making a deep inward bend between SC and M so as to form a large arc round the proximal side of the cell-dot; postmedian much nearer to cell-dot than to termen; distal area as on forewing.

Underside rather whiter, without irroration, forewing with some proximal suffusion and traces of cell-dot and (at least anteriorly) of postmedian, both wings with black terminal dots.

S. Kavirondo: Suna, May, June and September (W. Feather), 6♂♂ and 2 ♀♀ in coll. Tring Mus.

Very suggestive of some Palaearctic species, notably *lutearia* Leech (1897),

which is slightly yellower-tinged. May be placed next to *vitiosaria* Swinh. (1904), which is larger, with less shortened hindtarsus, the postmedian line less proximally placed, etc.

20. **Scopula atricapilla** sp. n.

♂, 24 mm. Head black, face with a narrow white band below, palpus white beneath. Antenna black-scaled in its proximal part (well over $\frac{1}{3}$); ciliation normal. Collar brown. Hindtibia dilated, with long, strong pale pencil; tarsus considerably over $\frac{1}{2}$.

Forewing white tinged with buff (about as in well-coloured *immutata* Linn. ♂♂), with only a few black scales; cell-dot small, black; lines brown, moderately distinct; antemedian slender, excurved between costa (at 4 mm.) and fold (at 3 mm.), again slightly excurved behind (thus angled inward at fold); median considerably beyond middle, less slender, nearly vertical from costa, bluntly bent about R^1, thence as oblique as termen but somewhat sinuous; postmedian slender, slightly lunulate-dentate, very weakly incurved between the radials and between M^1 and SM^2; subterminal shades weak; terminal dots black, minute; fringe unmarked.——*Hindwing* with termen inappreciably bent at R^3; cell-dot very small; median shade slightly incurved proximally to it; postmedian slightly more proximal than on forewing; outer area marked as on forewing.

Underside paler, except costal margin of forewing; minute terminal dots; forewing with cell-dot and very faint traces of the lines; hindwing virtually unmarked.

Kenya Colony: Kibwezi, 30 April 1917 (W. Feather), type in coll. Tring Mus.

Less white and more strongly marked than *lubricata* (Warr., 1905), coloured almost like average *latitans* Prout (1920); hindtarsus even less abbreviated than in the latter. Very distinct in the blackened vertex, a highly exceptional character in *Scopula*, though frequent in the allied genus *Problepsis*. Sternite of 8th abdominal segment with both cerata long and slender.

Subfam. **LARENTIINAE**

21. **Xanthorhoë steeleae** sp. n.

♂, 30 mm.; ♀, 33 mm. Apparently close to the South African *subspissata* (Warr. 1897, as *Polystroma*; ♀ = *brunneitrames* Prout, 1916), with the same ♂ antennal structure, the same ochreous-brown halo about the cell-dot of the forewing and very similar pattern, but with the characteristic blackish hair-tuft of the ♂ almost entirely wanting. Palpus probably darker (head lost in the ♀). Wing-pattern chiefly distinguishable by the less strong differentiation of the basal patch and median band of the forewing from its ground-colour, the blunter distal projection of the postmedian and especially the suppression of the oblique blackish mark from apex and of the almost equally blackish subterminal patch to which it leads; subterminal marked chiefly by neat white vein-dots, the lunules which connect them being mostly obsolescent.

W. Darfur: Djebel Murra, the ♂ type from Deriba Lakes, 8,000 feet, 25 April 1932, in beautiful condition, the ♀ from Dembilbil, 8,300 feet, on the S.E. side of the mountain, much torn. Both collected by Miss M. Steele. Type in coll. Brit. Mus., received through the Imperial Institute of Entomology.

22. **Perizoma eudoxia** sp. n.

♀, 28–30 mm. Face very gently rounded, moderately smoothly scaled; light green. Palpus 1½, heavily scaled, 3rd joint short, partly concealed; whitish, coarsely dark-speckled. Antenna serrate. Vertex green, mixed with white. Thorax above light green, with black-brown spots, on the patagia with an irregular white band; abdomen above cream-colour, coarsely irrorated (except on hinder end of segments) with black-brown and with a mediodorsal admixture of bright sandy-brown.

Forewing rather elongate; R^1 shortly stalked, SC^2 from apex of areole or very shortly stalked with $SC^{3,4}$, SC^5 from apex of areole; light green; markings black-brown (in the median band mostly lighter, brighter brown), narrowly edged with white; basal patch strong, crossed by a slight green belt close to base, and with its distal edge projecting slightly in cell and rather more strongly behind; median band 4 or 5 mm. broad at costa, little over 1 mm. at hindmargin, its proximal edge angulated outward in cell and at fold, inward on M and (more weakly) in front of SM^2, oblique outward to hindmargin, its distal edge rather irregularly crenulate, toothed outward behind R^3, thence oblique inward to hindmargin; thick blackish marks at costa and hindmargin on the band at its borders and a subtriangular one on its distal part between the radials; two wavy lines in the middle of the band, distinct costally (the distal oblique outward), convergent behind, enclosing between C and M a narrow discocellular area of the green ground-colour; subterminal line white, more or less completely broken into interneural spots, accompanied proximally by a subtriangular costal dark mark, a more or less confluent pair at radials and fainter posterior ones, distally by some dark dashes, of which the three between SC^5 and R^3 are strong; terminal line interrupted at veins; fringe white, dark-chequered.——*Hindwing* whitish, irrorated and suffused with fuscous, leaving freer a narrow band distally to the postmedian line, and faint traces of a subterminal; postmedian line indicated, rather acutely angulated at R^3; terminal line and fringe nearly as on forewing.

Both wings beneath more or less mottled, the forewing predominantly fuscous, the hind with more white; forewing with postmedian line and its whitish edging more or less developed in its costal half, subterminal whitish dots throughout, though only distinct as far as cellule 3; hindwing with black cell-mark and several vague wavy transverse lines.

Colombia: Sierra del Libane, 6,000 feet (H. H. Smith), 6 ♀♀ in coll. Brit. Mus.

23. **Perizoma spilophylla** sp. n.

♂, 29–32 mm. Face rounded, slightly prominent, rather noticeably oblique inward below, appressed-scaled. Palpus short (very little over 1), shortly rough-scaled. Antenna minutely ciliated. Head and body green, the abdomen pale, especially beneath.

Forewing broad, apex minutely falcate, termen sinuous, rather prominent about R^3–M^1, then rather more oblique; SC^1 well before apex of outer areole, SC^5 from or somewhat proximal to its apex, R^1 connate or stalked, DC^3 bent to become markedly oblique, M^1 well separate; asphodel green, almost without irroration; markings fuscous; basal patch small, enclosing a small green spot at extreme base, and not continued behind SM^2; lines indicated by large costal spots (as in *Heterophleps*), nearer to one another than to basal patch and apex, the

antemedian bluntly triangular, the postmedian more rhomboid ; further indications in a few minute dots on veins ; no terminal line ; fringe slightly paler, at least at tips, and with small fuscous dots at vein-ends.——*Hindwing* with margin rather elongate costally, curving decidedly from C to just behind SC^2, where it is round-pointed, thence feebly sinuous ; cell about $\frac{1}{2}$, DC markedly biangulate, with R^2 from behind middle ; C anastomosing to near end of cell ; SC^2 moderately stalked, R^1 rather widely separate ; whitish green, greenest at termen.

Forewing beneath slightly paler green than above, with indications (generally reduced) of the costal spots and with small dots on fringe. Hindwing slightly greener than above, with a curved postmedian represented by small vein-dots, rather conspicuous anteriorly but gradually fading out posteriorly.

Argentina : Siambon, Tucuman, 1,600 m., February 1933 (R. Schreiter), 3 ♂♂ in coll. Tring Mus.

Extraordinarily like a green *Heterophleps*. Taxonomic position decidedly obscure ; it can only be said that, pending further revision of the subfamily, its inclusion in *Perizoma* as now used in the New-World fauna (characters of *Euphyia* or *Anapalta* excepting the biangulate DC of hindwing) does not render that genus any more heterogeneous ; several have similar face and palpus and identical venation, at least one (*costiguttata* Hulst, 1896) has similar maculation, others similar wing-shape. Only the somewhat longer cells suggest possibly a more ancestral group.

24. **Perizoma tenuisecta** sp. n.

♂, 39–43 mm. Quite near to "*Antepirrhoë*" *vacillans* Warr. (1905), possibly a high-altitude race. Antennal structure similar (closely ciliate in fine fascicles, slightly longer than diameter of shaft). Abdomen more slender, less greenish, the black dorsal ornamentation rarely conspicuous.

Wings somewhat more dusky, less olive.——*Forewing* with median area generally more uniformly darkened, with little, if any, pale maculation in its central part, though the rippling of darker lines remains visible : the white boundary lines fine, but rather sharply defined, the postmedian with the projection at R^3 less sharp, sometimes much less sharp ; the broad shades proximal to the subterminal less interrupted than in *vacillans*, with a very conspicuous pale *line* cutting it at R^1 (in *vacillans* a broad pale *streak*) ; fringe much less dark-mottled opposite the veins, the rest of the pattern (rather indefinitely described by Warren) consequently very conspicuous, namely a very fine whitish line at base, then a broader dark one, a slender but scarcely interrupted clear white one and broad dark tips.——*Hindwing* noticeably darker than in *vacillans* ; fringe as on forewing.

Underside with similar distinctions.

Tucuman : San José, 2,500 m., March 1933 (R. Schreiter), 15 ♂♂ in coll. Tring Mus.

25. **Trichoplites tryphema** sp. n.

"*Trichoplites latifasciaria* Leech" Prout, *Journ. Bomb. Nat. Hist. Soc.*, xxxi. 310 (1926) (crr. det.).

♂, 45–47 mm. Face rounded, slightly prominent, without appreciable cone below. Palpus reaching scarcely beyond frons. Antennal ciliation minute.

Darker than "*Cidaria*" *latifasciaria* Leech (*Ann. Mag. Nat. Hist.* (6), xix. 644 ; Prout in Seitz, *Macrolep.*, iv. 245, t. 13c), especially in the median area of the forewing, which is decidedly less reddish, scarcely even so brightly coloured as in

Seitz' figure of *Triphosa multilinearia* (t. 13d), the strong gloss, indeed, somewhat recalling a *Triphosa*.——*Forewing* with cell-dot smaller, placed close to the darkened proximal part of the median area; the numerous subsidiary lines strongly expressed; subterminal white dot between R^3 and M^1 much reduced, a second one (more elongate, but very fine and slight) indicated between the medians, both succeeded distally by a vague dark spot.—*Hindwing* with DC^1 (as in true *latifasciaria*) not biangulate; markings strongly expressed in tornal area.

Forewing beneath with the sex-hair highly developed, its densest ridge subcostal (in the genotype, *cuprearia* [Moore] more concentrating in cell and along proximal part of R^3), but also with more delicate hair posteriorly and almost the entire wing clothed with specialised scaling.

Upper Burma: Hpimaw Fort, June 1923 (A. E. Swann), 2 ♂♂ in coll. L. B. Prout.

The true ♂ of *latifasciaria*, which I have now seen from Kunkala-shan (one in coll. Wehrli) and "W. China" (one in Tring Mus.), is much more closely like the ♀ type, rather smaller (thus definitely smaller than *tryphema* ♂), and can only by a further extension of our definition (which has already been made to cover species with non-biangulate DC of hindwing) be considered a *Trichoplites*, as the hairiness of the forewing beneath is only rudimentary (or, more probably, vestigial), though the face, palpus, wing-shape and pattern show unmistakable phylogenetic connection.

26. **Stamnodes eurypepla** sp. n.

♂ 31 mm. Closely similar to *gaudialis* Prout (NOV. ZOOL. xxx. 201), but almost certainly distinct, as species of this group vary so little.

Forewing with basal patch more extended, especially along costa and hindmargin, apical patch more extended, forming a solid dark area from somewhat proximally to middle of costa to middle of apex, its proximal edge somewhat concave, weakly bent about M^1; a whitish-buff costal dash or comma somewhat beyond middle of this area, just crossing SC^5.——*Hindwing* beneath with the white fold-streak ceasing 3 mm. before termen, the postmedian broken in its anterior half into a costal spot (just crossing SC^2) and a rather larger one from radial fold to R^3, its posterior part, on the other hand, reaching the termen without interruption.

Peru, without more exact locality (Le Moult), ex. coll. Ed. Brabant. Type in coll. Brit. Mus.

27. **Stamnodes plancta** sp. n.

♂. 36 mm. Face whitish, tinged with black and with a large inverted brown triangle in upper part. Palpus nearly as long and heavily scaled as in *Cophocerotis* (*jaspeata* Dogn., etc.); light brown, above white. Antenna closely lamellate, minutely ciliated. Head, body and legs light brown, in parts mixed with whitish.

Wings shaped nearly as in *ditissima* Th.-Mieg (*Le Nat.*, xxvi. 141, = *argentistriga* Warr., NOV. ZOOL., xi. 539), the hindwing not quite so large relatively; strongly glossy.—*Forewing* drab, in some lights with a greyer tinge, the costal margin indefinitely paler and more buff (rather broadly to about two-thirds); a broad oblique whitish line from apex to R^3, very slightly incurved about R^1; a less distinct line from costal streak just beyond middle, also running to R^3, where it is connected with the apical line by a slight pale suffusion; fringe pale brownish in

proximal half, whitish in distal; costal fringe also white towards apex.——*Hindwing* slightly greyer, with fine whitish costal streak, white costal fringe, a whitish streak from base to termen in front of cell-fold and R^2, and a second along submedian fold to two-thirds, where it branches, the main streak running to R^2 nearly parallel with termen while that along SM^2 becomes very fine and indefinite; fringe whitish.

Forewing beneath cinnamon-brown costally, Dresden-brown apically, the rest greyer and glossier; the apical streak (to R^1 only) and costal and distal fringes pure white. Hindwing beneath Dresden-brown with the markings of upperside sharply white.

Ecuador: Chiguinda (C. Buckley). Type in Coll. Brit. Mus.

A very interesting species, combining the palpi (almost) of *Cophocerotis* with the antenna of *Stamnodes* and the shape and facies of *Tora* Walk., especially its subsection *Synneuria* Mab. = *Lissopsis* Warr.; strikingly reminiscent of *S. triangularia* Btlt.-Calv. I think Forbes is right (*Journ. N. Y. Ent. Soc.*, xxv. 60) in regarding *Lissopsis* (and therefore of course *Tora*, which he did not know) as a mere pattern-group of *Stamnodes*.

28. **Eudule retroacta** sp. n.

♂, 25–26 mm. Head and body blackish, the abdomen slender and strongly elongate (group of *bimacula* Walk., 1854).

Forewing apricot orange, the markings dead black, with a slight tinge of olive-brown (blacker than in *halia*); costal edge, hindmargin to SM^2 and a narrow distal border (less than 1 mm. wide at tornus, widening gradually to about 3 mm. at apex) of this latter colour; also a moderate, oblique band crossing the cell close to the end (touching base of M^1) and terminating in the distal border at M^2 and fold, confluent proximally with a further black area between M and fold, which tapers to a point near base, but is slightly continued to base along vein M; thus the ground-colour forms an elongate streak in cell, a still longer between fold and SM^2 and a subapical patch with its proximal edge straightest, its distal regularly curved; fringe blackish.——*Hindwing* apricot-orange, with abdominal and posterior half of distal margin very narrowly black, apical region more broadly so.

Underside similar, but with the proximal black behind cell weaker and more blurred.

North Peru: Charape River, Tabaconas, 4,000 ft., 1912 (A. and E. Pratt), type; River Tabaconas, 6,000 feet (A., E. and F Pratt), paratype.

Near *halia* Druce (1885), the subapical patch of forewing broader and more oblique, not cut by blackish veins. 3 ♂♂ in the Tring Museum (one from Huamachuco, Peru, 3,200 m., and 2 from La Mota, nr. Cajamarca, Peru, 2,800 m., all collected by Simons, in November 1899) were misidentified by Mr. Warren as *halia*.

29. **Scordylia adventa** sp. nov.

♀, 26–28 mm. Head with palpus whitish, mixed—especially on face and outerside of palpus—with black. Thorax and abdomen black, with more or less admixture of whitish hairs, the abdomen robust, dorsally with fine whitish-yellow segmental rings. Hindwing with terminal spurs only.

Forewing with costa only slightly shouldered at base, termen rather more oblique than in the *cruciata* group; cadmium-yellow; costal area (to SC) much

paler and more fleshy ; basal area the same, but densely mixed with black, bounded by a straight oblique black line from hindmargin at about 3 mm. to costa rather nearer the base, thickening a little at costa ; a short black costal mark at 4 mm. ; a broad black half-band from costa just behind cell, reaching M^1 ; a black border somewhat as in *placida* Druce (1893) but considerably more concave between R^1 and M^2 ; fringe strongly chequered black and white, behind M^2 all black.——*Hindwing* rather elongate costally, termen between R^3 and tornus rather straight ; concolorous with forewing ; base blurred with blackish ; costal and apical area black, nearly as in *cruciata* Stgr. (1894), termen rather more narrowly so than in that species ; a black postmedian line, sharply angulated at R^3, then incurved, finally running towards tornus but becoming obsolescent ; fringe as on forewing.

Forewing beneath nearly as above, but with the apical region concolorous with hindwing ; the latter mixed whitish, black and bright-brown, the black predominating as far as the postmedian, the distal area paler, especially just beyond the postmedian ; a roundish pale spot just outside DC^2.

N.W. Patagonia : Leleque, territory of Chubut, 1,900 feet, December 1919. Type and paratype in coll. Brit. Mus., the latter with the postmedian costal patch more narrowed, tapering to a point.

The tibial armature is highly exceptional and if constant (as there seems little room to doubt, though each example has lost one hindleg) will necessitate the erection of a separate genus. The facies is rather that of a *Stamnodes*.

30. **Psaliodes antesignata** sp. n.

♀, 24–25 mm. Face with the cone long, subtriangular ; violet-grey. Palpus very long (at least 4) ; dark fuscous, the base beneath and the terminal joint light-brown. Head and body violet-grey ; collar and parts of the legs light-brown.

Forewing moderately broad, apex blunt, termen smooth, curved and strongly oblique ; both areoles ample ; violet-grey ; extreme costal edge light buff, intermixed with black-grey ; a deep brown subbasal band, slightly indented exteriorly at both folds, accompanied proximally by a deep fleshy shade, which neither reaches base nor hindmargin ; a triangular black-brown very slenderly fleshy-edged costal spot opposite DC, with some double scales at its end representing the cell-mark ; a second at nearly two-thirds costa ; the area between and behind these spots (i.e. specially between R^1 and R^3) suffused with deep fleshy and in middle with black-brown ; terminal area very faintly suffused with brown ; minute whitish dots at vein-ends ; fringe violet-grey, feebly chequered with brown.——*Hindwing* moderately broad, DC biangulate, with R^2 from behind middle ; paler grey.

Both wings beneath slaty-grey with small black cell-dot ; forewing distally with some slight buff costal marks ; hindwing with feeble indications of a post-median line of dark vein-dots.

Colombia : Sierra del Libane, 6,000 feet (H. H. Smith), 2 ♀♀, in coll. Brit. Mus.

31. **Psaliodes aparallela** sp. n.

♂♀, 26–29 mm. Palpus 2½. Antenna in ♂ proximally thickened, deeply lamellate, minutely ciliated. Legs simple. Abdomen of ♂ beneath with long, coarse, broad-tipped scales on either side, converging in middle. Both areoles

fairly large ; discocellulars little curved, with R^2 of both wings central. Head and body predominantly Sudan-brown to amber-brown (Ridgway, pl. iii, k), irregularly marked with pale olive-buff.

Forewing Sudan-brown in the ♂, paler (but with an amber-brown stripe beyond the postmedian) in the ♀ ; veins somewhat ochreous ; costal edge yellow-ochre dotted with blackish ; basal and median areas much darkened, suffused except in front of cell with blackish ; basal area ample, straight-edged ; median area moderate, almost straight-edged proximally, its edge more oblique than that of basal area, the intervening space white, mottled with olive-buff, and with a dark spot in cell ; cell-spot fairly large, but scarcely noticeable ; an ill-defined, less blackened triangle in median area between cell-fold and M^2 ; a slightly lunulate-dentate white line bounding median band distally, its inward tooth on SC^5 deep, an inward curve behind M^2 narrowing the median area ; ill-defined dark wedges in cellules 6 and 7 beyond ; a large dark terminal patch between apex and R^3, its proximal edge indented on the veins so as to resolve it into a very small element before SC^5, a rather larger one before R^1 and a still larger (2–2·5 mm. deep) between the radials ; a deeply lunulate-dentate dark line from R^3 to tornus, almost reaching termen on the veins ; fringe rather long, chequered ochreous and blackish, with an interrupted central line of dark irroration.——*Hindwing* pale vinaceous-buff or more greyish, shading off whitish at base and costa ; a feeble dark line about middle ; fringe ochreous with dark spots at vein-ends.

Forewing beneath blurred, with traces of the markings of upperside. Hindwing brighter, more ochre, with coarse dark irroration, a rather thick, sinuous postmedian (weakened or interrupted at SC^2–R^1 and R^3–M^1), incomplete subterminal (strongest posteriorly) and indications of terminal shading, especially about R^1.

Colombia : Sierra del Libane, 6,000 feet (H. H. Smith), 2 ♂♂, 3 ♀♀, in coll. Brit. Mus.

Near *tripartita* Warr. (Nov. Zool., xi. 72), which has similar but less highly developed sex-scales beneath abdomen, a strong hair pencil (not discernible in *aparallela*), the subbasal and antemedian lines parallel, etc. etc.

32. **Alloeoneura pastaza** sp. n.

♂, 31 mm. Close to *albicurvata* (Dogn., *Ann. Soc. Ent. Belg.*, lvii. 390, as *Isodiscodes*).

Forewing above less yellowish, coloured almost exactly like a *Trichozoma* ; median band narrower than in *albicurvata* (circ. 2 mm.), rather less strongly and irregularly bent in the middle ; subterminal shades more interrupted with white between R^3 and M^1.——*Hindwing* with postmedian line more sharply angulated on R^3.

E. Ecuador : Baños, Rio Pastaza, 6,000–7,000 feet (M. G. Palmer), type in coll. Brit. Mus.

33. **Isodiscodes renovata** sp. n.

♂, 28 mm. Face and vertex dark fuscous, both ringed round with ochreous-buff ; the postorbital rim and the short slender palpus also of the latter colour, the palpus with narrow dark fuscous mark above. Thorax and abdomen much as in *hyroglyphicata* Mssn. (*Stübel's Reise, Lep.*, p. 165, pl. ix, fig. 8).

Wings shaped and coloured as in *hyroglyphicata*, the white parts more tinged with ochreous (especially on the veins) than in Maassen's figure, but the only

specimens of his species known to me (Paramo del Tolima, 2 ♂♂) show also this tendency.——*Forewing* with the dark markings more consolidated; the five between basal and median forming a single band, only with slight dashes of the ground-colour at costa and hindmargin, and slight ochreous-whitish intersection on the veins; median band reaching costa (here nearly 2 mm. wide), solid in its central part; the three costal spots beyond confluent, the middle one large, giving birth to a double dark line, which is only interrupted at the veins; termen with a row of elongate whitish-ochreous vein-spots; fringe fuscescent, with weak pale spots, the only large one being between R^3 and M^1.——*Hindwing* above with faint traces of the dark curved lines of underside, especially the subterminal.

Underside much more strongly marked than in *hyroglyphicata*. Forewing much as above, though more blurred. Hindwing with black cell-dot, coarse dark irroration (leaving clearer a broad, weakly divided band beyond middle) and somewhat diffuse wavy postmedian and subterminal dark lines, the postmedian not (as in the faintly traceable line of *hyroglyphicata*) angled in middle.

Colombia: Sierra del Libane, 6,000 feet (H. H. Smith), type in coll. Brit. Mus.

34. **Trotocalpe leucoparypha** sp. n.

♂, 17–18 mm. Distinguished from the genotype (*albilunata* Warr.), apart from its much smaller size, as follows.

Head, body and wings rather browner in tone.

Forewing much more unicolorous, the median area not or scarcely darkened, all the lines indistinct, extremely fine, the postmedian more excurved about the radials; the small blackish cell-dot present; a small apical patch—from costa to R^3—blue-white, with only a slight admixture of scales of the ground-colour; a cleaner white line at base of anterior half of fringe. Beneath without the white lunule (or pair of spots) which characterizes *albilunata*.

Bolivia: Rio Suruta, dep. Sta. Cruz, 400 m., August (J. Steinbach), 3 ♂♂ in coll. Brit. Mus.

35. **Hydrelia laetivirga** sp. n.

♀, 26 mm. Group of *subobliquaria* (Moore, 1867)—genus *Autallacta* of Warren. Both wings with the angle at R^3 rather sharper, about as in *lineata* (Warr., 1893). Head and body concolorous with wings; face, palpus and collar browner.

Forewing rather pale olive-buff, with greyer irroration; cell-dot minute, black-grey; lines brown, the median (" postmedial " in Hampson) strongest and darkest; a rather strongly curved subbasal, not reaching costa; two fine and weak between this and antemedian, both angled outward subcostally, the more proximal lost behind M, the other incurved at fold, lost behind SM^2; antemedian from costa at 4·5 mm. to hindmargin at nearly 2 mm., gently excurved, with some pink suffusion proximally; median from $\frac{7}{10}$ costa to $\frac{3}{5}$ hindmargin, almost straight; postmedian slender, at costa scarcely over 1 mm. from median, straight to behind R^3, then weakly bent and becoming faintly sinuous; space between median and postmedian almost entirely filled with congo-pink or japan-rose; a faint line close beyond postmedian, not reaching hindmargin; a longitudinal dark line from median to termen behind R^3; terminal line fine, more blackish; fringe concolorous.——*Hindwing* concolorous, with median and outer markings continued, including the pink band, but without longitudinal line.

Underside duller, ground-colour paler, forewing with ample greyish suffusion, particularly as far as the median line ; both wings with minute cell-dot ; median line and markings beyond as above ; no pink band, nor longitudinal line.

Szechuan : Mt. Pehlinting, 6,000 feet, 50 miles N.N.W. of Chengtu, July–August (G. M. Franck), 1 ♀ in coll. L. B. Prout.

Even should the pink band prove inconstant (cfr. *Sterrha aversata* Linn., etc.), the shape of the wings, the tone, much less irregular antemedian line and other differences will abundantly distinguish this species from *subobliquaria*.

Subfam. **GEOMETRINAE**

36. **Drepanogynis arcuifera** sp. n.

♂, 38–39 mm. Face with moderately appressed scales, partly red-brown. Palpus little over 1, more or less strongly reddish on the outerside. Fillet narrowly white. Breast partly red-mixed. Thorax above concolorous with forewing, abdomen more greyish than hindwing, not robust.

Forewing moderately broad, apex appearing minutely falcate, on account of a very slight concavity between SC^4 and R^1 (which is near costa), termen smooth, strongly curved ; SC^5 wanting ; pinkish-buff or towards vinaceous-buff, with some yellower suffusions and with a few scattered and extremely fine greyish strigulae ; markings browner ; antemedian very oblique outward from costa at 6 or 7 mm., strong at first, then slighter, curving so as to cross DC^3 close to R^3 and then to return to costa little over 3 mm. from apex as a thickening postmedian line ; the enclosed costal space partly suffused with a more ochreous shade ; a very small ochre-suffused patch at hindmargin, representing the posterior end of median area, generally bounded distally by a short streak at about middle of hindmargin (representing the postmedian) and perhaps proximally by a slighter streak, the two apparently meeting anteriorly (at or before reaching the position normally occupied by the—here scarcely traceable—fold).——*Hindwing* rather elongate costally, termen moderately rounded, without noticeable irregularities ; pale yellow-orange, in places rather warmer ; abdominal margin posteriorly ecru-drab and with traces of the beginning of a dark postmedian line, running very obliquely forward from near tornus.

Both wings beneath much suffused with chamois, brightening and deepening in places ; forewing pale at the extreme apex and with the beginning of the postmedian line ; hindwing with a dark cell-dot and with a slightly curved line (variable in thickness) from apex, generally traceable almost to R^3 just outside the cell.

S. Africa : Natal National Park, March 1932 (J. Ogilvie), type received through the Imperial Institute of Entomology ; also a fairly good ♂ from " Cape Colony " and a damaged one from Grahamstown, both received from the Albany Museum in 1900 ; all in coll. Brit. Mus.

37. **Ischnopterix subalbata whitei** subsp. n.

♂, 44 mm. Differs from *s. subalbata* Dogn. (1910, French Guiana) chiefly in the presence of an irregular blackish median shade (angled outward about cell-fold, incurved posteriorly), which is also more or less developed beneath ; the head and thorax above are generally whitish, but are somewhat variable.

♀ considerably larger (51 mm.), with the white markings extended in distal area.

British Honduras : La Cambre (J. Lienhart), 3 ♂♂ (including type), 1 ♀ in coll. Brit. Mus. ; Punta Gorda, May 1933 (J. J. White), 1 ♂, which called my attention to this race, though as it is somewhat damaged I have not made it the type.

38. **Pero collenettei** sp. n.

♂, 39 mm. Closely similar to *spitzi* Prout (1928) and with the same antennal structure. Smaller. Coloration of head and body as in dark *spitzi*, except that the hair-scales at the extremity of the abdomen are more ochreous-brown.

Forewing termen with the teeth at R^1 and M^1 (notably the latter) more acute ; postmedian line with the inward curve between the two folds much shallower ; distal area much less variegated, the prevailing tone somewhat olive-buff.—— *Hindwing* termen with more noticeable teeth, particularly at M^1 ; predominantly rather dark ; postmedian line oblique outward from fold to abdominal margin ; distal area with a more conspicuous ochreous-brown patch at posterior end.

Underside much as in *spitzi* but less variegated, the paler parts less white, the bright brown patches much less developed, ill-defined.

Matto Grosso : Urucum, 15 miles S. of Corumba, 650 feet, at human perspiration, 16–23 November 1927 (C. L. Collenette), type ♂ in coll. Tring Mus.

39. **Pero nyctopa** sp. n.

♂, 30–36 mm. ; ♀, 37–41 mm. Head and body concolorous with wings. Antenna of ♂ with long pectinations (the longest at least 6).

Forewing with termen shallowly sinuate between the radials, blunt-toothed at R^1, almost smooth in the oblique posterior part ; somewhat variable in colour but always dusky (deep fuscous-grey or somewhat more brownish), either nearly unicolorous or with the median area darkest, proximal and distal areas sometimes with a moderate brown admixture ; cell-mark creamy white, more or less comma-shaped, with slight blackish circumscription ; lines black, varying in their separation (at costa anything from 6 to 9 mm. apart) ; antemedian irregularly oblique outward to its acute angle at cell-fold, further with a strong outward tooth at submedian fold and strong sinuosities behind ; postmedian sharply dentate from costa to behind R^2, incurved between the last tooth and a blunt double lobe at fold, again inbent at SM^2 ; black interneural dots close to termen. ——*Hindwing* with termen quite weakly crenulate, the tooth at M^1 a trifle stronger ; almost uniformly dusky, the best-marked specimens showing a fairly distinct, weakly sinuous postmedian, hardly curved and little beyond the cell ; dots close to termen.

Underside slightly less dark ; both wings with weak postmedian line and traces of the admarginal dots ; cell-mark of forewing whitish, of hindwing dark (but not very strong), with whitish scaling in the middle.

British Honduras (J. J. White) : Punta Gorda (loc. typ.), 2 ♂♂, 2 ♀♀ ; Rio Grande, 2 ♂♂, 1 ♀ ; Columbia, 1 ♂, 1 ♀ ; all in coll. Tring Mus.

An unimposing species, but I know none with which to compare it.

40. **Aphilopota dicampsis** sp. n.

♂♀, 44–50 mm. Head and body concolorous with wings. Shaft of antenna rather dark, with a few pale spots.

Forewing brown, inclining to bistre or slightly more reddish, the ♀ a little darker than the ♂♂; some black irroration; costal edge dark, with very slender pale strigulae; cell-spot long and heavy, slightly longer than in *phanerostigma* Prout (1917); antemedian line from costa at 5 or 6 mm., sinuous but without any very strong curves, the strongest being inward between M^1 and SM^2; postmedian slightly thickened on the veins, so as to project proximally, arising 4 or 5 mm. from apex, markedly incurved between R^3 and (just behind) M^2, so as to cross R^3 and M^1 close to their base; subterminal pale, dentate, chiefly defined by a slender dark band on its proximal side; terminal line very weak, developing inconspicuous interneural spots.——*Hindwing* rather elongate costally, termen waved, not strongly convex; antemedian line wanting, the rest nearly as on forewing, only with the irregularities in the course of the postmedian a little stronger.

Underside paler; cell-spots conspicuous; traces—especially in the ♂♂—of the postmedian line, sometimes strengthened at the costa.

Kenya Colony: Kitale, April 1926, type ♂ and four others in coll. Tring Mus.; August 1925, and April 1927, paratypes, 5 April 1926, allotype ♀, in coll. Brit. Mus.; all from G. W. Jeffery.

Probably nearest to *foedata* Bastelb. (1907), Tanganyika Territory, which I know only from an uncoloured figure, but which has the lines punctiform, the postmedian nearly straight.

41. **Cerurographa faceta** sp. n.

♂, 39 mm. Head mixed white and blackish-fuscous, face blackish in upper half, pale in lower; vertex strongly rough-haired. (Antennae lost, a remnant shows that the pectinations will be long.) Patagia white in front, then black. Thorax above largely black. Abdomen above more brown.

Forewing shaped nearly as in *bistonica* (Prout, 1922) or slightly more elongate; cell well over $\frac{1}{2}$; venation slightly different from that of *bistonica* in that $SC^{1,2}$ are just stalked, R^1 well separate at origin from SC^{3-5}, R^2 about central; white, with irregular, coarse irroration of brown or fuscous or in part black, and with the macular black markings laid on in transverse striation; subbasal at costa and in base of cell; antemedian at about 4 mm., forming a strong spot from costa to cell, a small one on M and an acutely triangular one posteriorly (its angle outward on SM^2), slightly connected by a sinuous line; median line sinuous from a mid-costal black mark to hindmargin near postmedian, the approximated parts (behind the vaguely indicated discal ocellus) nearly filled with dark (posteriorly black) clouding; a black postmedian line oblique inward from $\frac{5}{7}$ costa, slightly excurved behind R^1, deeply incurved between the folds and again slightly between submedian fold and hindmargin; irregular dark shading outside the postmedian, then a predominantly white area, chiefly interrupted by spots and dashes which mark the distal boundary of the subterminal between SC^5 and R^3 and between M^1 and tornus; terminal spots elongate longitudinally, connected by a line.——*Hindwing* fuller and with more rounded termen than in *bistonica*, termen similarly suberenulate; cell well over $\frac{1}{2}$; white, with small black cell-spot, weak dark shading or irroration near hindmargin and termen, including an outwardly oblique postmedian dash at hindmargin and a slightly curved proximal-subterminal dark band between M and tornus; termen as on forewing.

Underside similarly but rather more weakly marked ; forewing with a rather large dark cell-spot.

Natal : National Park, March 1932 (J. Ogilvie), type in coll. Brit. Mus., presented through the Imperial Institute of Entomology.

The shape, cell-spots, outwardly oblique antemedian line and strong median cloudings of the forewing abundantly distinguish this species. The hairy vestiture of the legs, though not emphasized by Janse as one of the differential characters of his *Cerurographa* (*Moths S. Afr.*, i. 272), seems to me somewhat important and is well developed in *faceta*.

42. **Medasina strixaria ceylonensis** subsp. n.

♂ 56–70 mm. ; ♀, 89–90 mm. Smaller than *s. strixaria* Guen. from (North) India. Less clouded with grey, particularly the ♂ ; cell-spots reduced, especially that of the hindwing, which is punctiform, not annular, that of the forewing in ♂ sharply black, in ♀ more shadowy.

Ceylon, the type ♂ from Pundaluoya, in coll. Tring Mus.

43. **Alcis arisema** sp. n.

♂, 44–51 mm. Palpus rather short (less than $1\frac{1}{2}$), rough, terminal joint small, but distinct. Antenna scarcely $\frac{1}{2}$ wing-length, pectinate to nearly 40 joints, the longest pectinations 6 or more, their length decreasing gradually. Head and thorax sayal-brown to snuff-brown, with some lighter and darker admixture, palpus darker ; body beneath more buff, abdomen above with a conspicuous white spot at base, then predominantly occupied by fuscous maculation. Fore- and midlegs largely infuscated, with pale spots ; hindtibia with moderate, pale hair-pencil.

Forewing rather broad, termen moderately oblique, gently curved, slightly waved ; fovea moderate ; SC^1 out of SC^2 near base, anastomosing moderately with C, C beyond the anastomosis weak, occasionally obsolete (base of SC^1 also occasionally almost obsolete, leaving nearly the venation of *Boarmia*) ; proximal and distal areas bright brown, inclining to tawny or sayal-brown, more or less mixed with blackish-fuscous, the clearest brown patch midterminal ; median area in the type form white, in fairly common aberrations more or less suffused throughout with brown, in rare cases retaining a narrow white band between median and postmedian ; two strong blackish lines, the antemedian at about 6 mm., straightish, with a slight inward bend between base of M^2 and fold, the postmedian from about $\frac{2}{3}$ costa, with two strong outward projections, the first (between the radials) the longer and rounder, the second (between M^1 and fold) gradual anteriorly but producing nearly a right angle at fold, between which and hindmargin the line forms an inward curve ; a zigzag brown median line, always well expressed as a dark costal spot, subsequently very variable in strength ; cell-spot small ; an irregularly dentate white subterminal conspicuous anteriorly and posteriorly, more or less obsolete in middle ; blackish-fuscous shading proximally thereto ; terminal line strongest between the veins ; fringe weakly chequered.—— *Hindwing* with termen well rounded, rather weakly crenulate ; white, with some marginal maculation concolorous with forewing ; a large or moderate dark cell-dot ; a fairly direct postmedian line from abdominal margin to R^1, more or less obsolete in front, typically conserved in a dot on SC^2 ; subterminal defined by its

dark proximal shading from tornus to M^2 and again by a spot on radial fold ; terminal line rather strong.

Underside similarly marked but more blurred, the brown parts greyer, the forewing with additional clouding running from the proximal area, suffusing the cell and extending to the median line, which is only developed in this anterior part.

Tibetan frontier of W. China : Tse-ku (R. P. J. Dubernard), a magnificent series in Brit. Mus. (ex coll. Oberthür).

Two smaller but closely similar ♂♂ from Szechuan have recently been received from Mr. G. M. Franck and probably represent a race. I describe them as :

A. a. francki subsp. n. (?? gen. II). ♂ 40 mm.——*Forewing* with proximal and distal areas more uniformly infuscated, median line on underside complete.—— *Hindwing* with the marginal maculation more infuscated, confluent into a band, both on upper- and underside.

Szechuan : Pehlinting, 6,000 feet, 50 miles N.N.W. of Chengtu, July–August, type ♂ ; Vrt. Omei, 3,500 feet, 17 August 1931, 1 ♂. The latter very worn, but representing the form with median area of forewing dark-mixed.

A ♀ from Momeit, Upper Burma, 600 m. (Doherty, 1890), in coll. Oberthür, has about the size of *a. francki* but the coloration and maculation almost as in *a. arisema*, only the forewing with the postmedian considerably less bent posteriorly, the underside less suffused in the cell.

44. **Iridopsis schreiteri** sp. n.

♂♀, 30–35 mm. Antennal pectination of ♂ moderately long, continuing to rather near apex (within $\frac{1}{5}$). Hindtibia of ♂ moderately dilated, with hair-pencil, tarsus not much less than 1. Head and body concolorous with wings ; abdomen above with more or less distinct paired blackish spots, each pair with suggestion of pale middorsal separation.

Forewing rather elongate, costa straightish, termen weakly subcrenulate, gently curved, strongly oblique ; fovea less entirely obsolete than in most *Iridopsis* ; whitish grey, very copiously peppered with fuscous ; costal edge with irregular blackish spots and strigulae ; cell-spot moderate, reniform, slightly purer grey, with fine dark circumscription, sometimes darker grey almost throughout ; lines slender, inconspicuous, often interrupted ; antemedian generally thickened at costa, angled outward subcostally, thence indefinite, sometimes macular ; the usual broader and browner shade proximally to it developed or indicated ; median irregular, rather variable, originating in a costal spot opposite or shortly beyond the cell-spot, outbent at first, incurved or obsolescent behind middle, nearly always strong at hinder end, where it is very near to and parallel with the postmedian ; postmedian usually spotted or dotted at some at least of the veins, arising about midway between cell-spot and apex, very strongly oblique inward from R^2 to R^3–M^1 close to their base, thence indefinite and sinuous, reaching hindmargin little beyond middle ; the usual brown shade indicated beyond it ; the crenulate subterminal, at least in parts, distinct and fairly broad, more or less completely dark-defined distally ; a dark spot proximally to it between R^2 and R^3 and oblique dark shading distally from about R^1 to, or towards, termen near apex ; terminal line lunulate, developing into strong black vein-dots proximately ; fringe with a weak dark dividing-line of maculation. *Hindwing* with termen

strongly crenulate; cell-spot similar or weaker; a double median line well developed posteriorly; postmedian with less extreme curvature than on forewing, it and often the brown shade beyond it strongly darkened at abdominal margin; subterminal dark-shaded distally and sometimes proximally; terminal and fringe as on forewing.

Underside smoother-looking, much less irrorated, the forewing brown-greyish, the hindwing paler; an oval blackish cell-spot on forewing, a small one (or dot) on hindwing; forewing with some dark dots at costa and with an ill-defined dark subterminal shade, moderate anteriorly, slender or obsolescent in posterior half; an ill-defined pale spot at apex.

Tucuman: Siambon, 1,600 m., January and February (R. Schreiter), 5 ♂♂, 5 ♀♀, in cell. Tring Mus.

Perhaps related to *piperata* Dogn. (1906), though so much smaller.

45. **Iridopsis leucochitonia** sp. n.

♂, 36–40 mm. Intermediate between *muscinaria* (Snell., 1874) = *ciocolatinaria* (Oberth., 1883) and *alternata* Warr. (1904), though smaller than either. At first glance almost indistinguishable from the most warmly coloured aberrations of the former.——*Forewing* with cell-spot generally standing out more clearly, the median and postmedian markings in its vicinity less heavily macular; postmedian more equally developed throughout, always rather strongly incurved between M^2 and SM^2; subterminal white spot between SC^5 and R^2 undeveloped. ——*Hindwing* with proximal area more sharply white, not or very little irrorated with grey; post-median on an average more angular between the radials; subterminal with somewhat more regular grey shading proximally, though not comparable to the broad blue-grey shade of *alternata*.——Underside with the dark shades chiefly subterminal, recalling those of *alternata*, though considerably narrower, on hindwing obsolete.

Carabaya, S.E. Peru: La Oroya, type ♂ and another, in coll. Tring Mus.; Santo Domingo, 4 ♂♂. Bolivia: Charaplaya, 2 ♂♂; Rio Solocame, 1 ♂; Rio Songo to Rio Suapi, 2 ♂♂; Cochabamba.

The genitalia show a closer resemblance to *alternata* than to *muscinaria*, both in the longer uncus and the shape of the dorsal part of the valve.

46. **Iridopsis mastistes** sp. n.

♂, 43–51 mm. Superficially almost or quite indistinguishable from *rupertata* (Feld., 1874). On an average less large (from Chulumàni, whence the Tring Museum received both from Simons, the largest of the four *mastistes* measures 48 mm., the one *rupertata* 53 mm.; from Carabaya, where *rupertata* was only taken at higher altitudes—7,000–9,000 feet—one *rupertata* measures 49 mm., the other four 51–53 mm.).——*Forewing*, except in a few whitish, *syrniaria*-like aberrations, generally more profusely irrorated or suffused with grey and brown, thus presenting a somewhat less sharply-marked appearance, in particular with less white between the double median line and the postmedian; cell-spot on an average larger and more heavily dark-suffused; postmedian often appreciably less sinuous, but quite unreliable; apical white spot generally with about the same amount of suffusion and irroration as in *rupertata* (less clear white than in *salmoncaria* (Ob., 1883).——*Hindwing* with discal lunule nearly always long, often longer than in any *rupertata* known to me.——Underside almost exactly

as in *rupertata*, typically with the fuscous subapical spot ending abruptly at or about R^3, not infrequently also with a small, generally shadowy, apical spot on the hindwing and less frequently with very faint maculation —or even the suggestion of a subterminal line—about the medians of the forewing, but never with the heavy subterminal shades of *salmonearia*.

Genitalia very distinctive ; the strong, pointed, blade-like costal arm of the valve more twisted than in *rupertata* and *salmonearia*, near its base so acutely bent that its direction becomes ventrad instead of caudad ; in addition, a very slender whip-like process (wanting in both the allies) arising from a hard rough patch on the innerside of the valve near its costa proximally. (In *rupertata* and *salmonearia* the pointed end of the costal arm is more produced, the tips in situ crossed for a considerable distance ; in *rupertata* scarcely bent ventrad, in *salmonearia* considerably bent, but less extremely than in *mastistes*).

S. Ecuador, E. Peru and E. Bolivia, chiefly at altitudes of 3,000–6,000 feet ; particularly common at Santo Domingo, Carabaya, 6,000 feet (type in coll. Tring Mus.) and La Oroya, 3,100 feet.

47. **Iridopsis gaujoni** sp. n.

♂, 38–44 mm. Upper surface more suffused with brownish than in the *syrniaria* (sens. str.) group, the bands which accompany the lines inclining to cinnamon, the subapical patch of the forewing in well-coloured examples approaching hazel ; altogether suggestive of small, rather blurred examples of *salmonearia* (Ob.), under which name it was freely distributed by Dognin ; the brown shades, however, not quite so warm as in that species, the white parts—particularly the apex of the forewing—not so clean, postmedian line of forewing scarcely ever so deeply incurved behind M^2 ; cell-spots, or at least that of the forewing, generally well filled-in with grey. ——Underside rather variable, typically with the subterminal bands as extended, or almost as extended, transversely as in *salmonearia*, but not so broad, on the hindwing generally more shadowy ; not rarely almost or entirely obsolete on the hindwing, occasionally also on the posterior part of the forewing, in the latter case confusingly similar to the underside of the *syrniaria* group.

♂ genitalia with the costal arm suffused to the valve, which tapers much as in *haploancala* Prout (1932). Conceivably a browner, more *salmonearia*-like race of that species, but the costal arm is not so produced at its tip and there are other difficulties in uniting them.

Ecuador, especially in the Loja district ; type ♂ in coll. Tring Mus. There is also a short series from Popayan, Colombia (Lehmann) in the same collection.

48. **Gasterocome polyspathes** sp. n.

♂, 40–42 mm. (a dwarf 35 mm.). In structure like *G. pannosaria* (Moore, 1867), SC^1 and SC^2 of forewing arising from the cell separately ; in shape and in the more ochre-yellow tone and coarser black irroration more recalling *euryzona* (Hmpsn., 1895), yet without the increase of the black clouding in median area of forewing. ——*Forewing* with the essential markings of the allies ; cell-mark as heavily black-bordered as in *pannosaria contacta* (Warr., 1899) ; antemedian line rather less near to subbasal than in *pannosaria* ; sinuous white line beyond postmedian very slender, but not or scarcely interrupted ; proximal subterminal band quaker-drab or violet-grey, neither blackish (as in *euryzona*) nor tinged

with red (as in *pannosaria*) ; pale midterminal spot (R^3 M^2) on the whole clearer. ——*Hindwing* with costa not whitened as in the allies ; markings nearly as in *pannosaria*, on an average heavier, the terminal band variable in the same direction as in *pannosaria* ; cell-dot on an average larger than in typical *pannosaria*.

Underside recalling that of *euryzona*, except in the more solid dark border of the hindwing.

Ceylon : the type and several others from Maskeliya (G. E. Alston) in coll. Brit. Mus. ; Uva and Petipola in the same collection.

49. **Diplurodes shoreae** sp. n.

♂♀, 29–31 mm. Face dirty white, narrowly dark-suffused above. Palpus rather short, with 3rd joint inconspicuous. Antenna of ♂ with the fascicles 2 or slightly over. Hindtibia with hair-pencil. Lateral tufts of abdomen not very strong. Head and body concolorous with wings.

Forewing normally shaped, or in the ♂ rather more rounded, especially at apex ; C well free in all known examples ; prevailing tone grey rather than brown, the whitish ground-colour showing in the median area in a ♀-ab., while in the ♂ and one ♀-f. it is suffused with lilac-grey or pale quaker-drab, the rest of the wing in both sexes with this tone underlying the variable dark cloudings ; costal spots, or at least the median, strong or moderately so ; antemedian line well excurved ; median oblique outward, but not, or scarcely, escaping confluence with the cell-spot, then irregularly excurved, the narrow space which posteriorly separates it from the postmedian entirely filled in some examples with blackish suffusion, much as in *parrularia* (Leech, 1889) and some *semiparata* (Walk., 1861) ; postmedian less sinuous than in most *Diplurodes*, in the ♂ slightly, in the ♀ somewhat more strongly, excurved between the radials ; dark cloudings of distal area (when developed) placed about R^3–M^2 proximally to the subterminal, between the radials distally ; subterminal chiefly defined by a dentate dark line proximally and especially a costal spot ; the usual terminal spots present.——*Hindwing* concolorous with forewing, in the non-clouded examples pretty uniform, in the clouded ones pale at the base, dark-mixed in median area ; cell-dot black, strong ; the two lines approximated, nearly parallel, thick or fine according to the individual, the postmedian not noticeably angulated in the middle ; subterminal line indicated as on forewing ; terminal dots present, sometimes large.

Forewing beneath whiter, almost solidly blackish from postmedian to termen, even the usual white apical and midterminal spots very slight (especially the latter) ; an ill-defined antemedian line or shade, which in the ♀ meets the bent median line of the hindwing, and a broad, irregularly bent median shade which obscures the large black cell-mark and is more or less connected with the dark border by shading about R^3. Hindwing of ♀ similarly coloured to forewing, with conspicuous elongate black cell-mark ; of ♂ suffused with black-grey to near base, this area mostly occupied, from R^1 hindward, by specialized scaling which becomes rougher near tornus.

India : Dehra Dun, U.P., 2 ♂♂, 3 ♀♀, the type ♂ 31 October 1930 (G. D. Bhasin), the two best ♀♀ bred from larvae found feeding on *Shorea robusta* (R. N. Mathur), emerged July 1933. Type in the British Museum, paratypes in my collection, kindly presented by the Forest Research Institute and College, Dehra Dun.

50. **Geolyces tanytmesis** sp. n.

♂♀, 36–41 mm. Head and body concolorous with wings. Midtibia not fringed. Hindtibia broadly dilated, with hair-pencil; tarsus abbreviated, scarcely over ½.

Forewing with costa straightish to near apex, apex slightly produced, termen faintly sinuate, as far as the pronounced elbow at R^2 not noticeably oblique, then strongly oblique, almost straight, tornus pronounced; subcostals somewhat crowded, the stalk of $SC^{1,2}$ fairly long, SC^{3-5} arising well before apex of cell, M^1 well before hindangle; fawn or towards army-brown, in variable nuances, the brightest part (an ill-defined band bounding the postmedian distally) in some specimens almost mikado-brown or orange-cinnamon; a blackish longitudinal streak from base along cell-fold and R^2 almost to termen, lost at extreme end in some dusky anterior suffusion; a grey shade (sometimes with tinge of olive) in front of this line as far as the postmedian; antemedian line faint except at costa, sharply angled at the longitudinal streak; median line thick, dark, from just beyond middle of costa, very acutely angled outward just in front of the streak, forming an inward curve between this and hindmargin; postmedian subparallel with median, but more roundly bent anteriorly, chiefly expressed by black, distally white-tipped vein-dots, the interspaces showing weak and irregular grey lunules inward; between SC^5 and R^1 a clear buff spot just outside the postmedian, followed immediately by the costal beginning of a sinuous pale-grey subterminal; fringe mostly darkened.—*Hindwing* with termen crenate anteriorly, right-angled at R^3, thence straight to the rectangular tornus; concolorous with forewing, median area somewhat more regularly suffused with grey; a strong black cell-dot; a straightish dark proximal line; the lunulate-dentate postmedian approximately parallel with termen; white dots at the tips of its teeth; fringe as in forewing.

Underside light vinaceous-drab or slightly greyer, the cinnamon band fairly bright or at least indicated, the buff spot strong; both wings with black cell-spot, dark median (antemedian) line and traces of fine dentate postmedian.

Cameroons: Bitje, Ja River (G. L. Bates), 3 ♂♂, 1 ♀, in coll. Brit. Mus.

In shape and structure probably nearest *rufaria* Swinh. (1905), but quite different in colour and markings; in the latter respect much more like *flavimacula* Hmpsn. (1910, *Mesocoela*), which has the hindwing rounded, etc.

51. **Epigynopteryx termininota** sp. n.

♂♀, 37–40. Curiously similar to *Xanthisthisa tergorinota* Prout (*Bull. Soc. Lep. Genève*, vi. 26, t. 1, f. 7), which is probably congeneric, though I placed it in *Xanthisthisa* on account of the retention of the base of SC^1 of forewing. Only noticeably divergent from the detailed description and figure thereof in the points here enumerated.

Upper edge of face and outerside of palpus deep fuscous, the palpus nearly 2, with 2nd joint porrect and 3rd joint rather long (nearing 1). Dorsal markings of abdomen reduced to some very small, well-isolated spots.

Forewing with the long stalk of $SC^{1,2}$ connected by a short bar (in one example shortly anastomosing) with C, M^1 almost connate with R^3; ground-colour pinkish-buff to cinnamon-buff; lines rather more deeply sinuate, more sharply accompanied in the median area by small white and then black dots on the veins; dark

spot outside the postmedian and terminal maculation between the radials more pronounced, the former separated from the termen by a definitely cinnamon-buff suffusion.——*Hindwing* (concolorous with forewing) with the postmedian more sharply angulated between the radials.——Forewing beneath with the terminal mark between the radials sharply blackish-fuscous.

Fernando Po: Moka, 28 January–3 February 1933 (W. H. T. Tams), type ♂; W. Kivu: S. side of Middle Lowa Valley, S. of Walikali, 3,500 feet, forest, March 1924, wet season (T. A. Barns), 1 ♀; Uganda: Bugome Forest and Kisaru, June 1933 (H. B. Johnston), 2 ♀♀. All in coll. Brit. Mus.

The ♂ characters in this species (and therefore probably in *tergorinota*) are so exceptional for *Epigynopteryx* that a new genus will probably be demanded on a systematic revision, unless one of the kindred South American genera can contain it. Antenna almost simple (minutely ciliated); fovea well developed. The hindtibia (as in most of the group) is not dilated.

52. **Epigynopteryx coffeae** sp. n.

♂♀. 30–36 mm. (probably dwarfed by breeding). Face and most of palpus blackish-fuscous; 1st joint of palpus pale, its rather long hair slightly mixed with fuscous. Antenna of ♂ with the last 6 or 8 joints non-pectinate; of ♀ simple. Hindtibia not dilated. Vertex anteriorly pale, but not so white as in *mutabilis* (Warr., 1903), occiput greyer. Thorax and abdomen concolorous with wings; abdomen with a pair of black dorsal spots at base.

Forewing with costa arched, termen in ♂ only very weakly sinuate between the apex (which is rather blunt) and a very slight prominence at R^3, termen in ♀ almost as extremely produced at apex and at R^3 as in *molliaria* (Guen.; Oberth., *Et. Lép. Comp.*, ix, f. 1905); much greyer than in that figure, the ochreous tint only suggested in places (chiefly in the median area) and even there scarcely so bright as in *molliaria*; slight irregular dark irroration, the amount variable individually; costal edge weakly spotted (pale and dark); cell-dot small or minute; lines fine, whitish buff, slightly brown-edged in median area; antemedian indistinct, more or less interrupted, oblique outward from costa to SC, here marked by a small black dot, thence less (sometimes scarcely) oblique, rather irregular, with appreciable dark dots at M and SM^2; antemedian complete (not macular, as in *mutabilis*), its dark shading strongest from costa to SC^5, close to costa angled inward, about SC^5 outward, much as in *molliaria*, but in its subsequent course forming a very gentle and regular curve; succeeding area rather variable, generally with a dark hindmarginal dot or spot touching the postmedian, sometimes with some rather strong zigzag or macular dark clouding proximal to the subterminal posteriorly and almost always with blackish pre-subterminal interneural dots or spots between SC^4 and R^2; subterminal from R^2 hindward lost in a broadening but ill-defined pale area which runs to tornus; fringe slightly browned proximally, pale distally.——*Hindwing* with the angle at R^3 weak in the ♂, better developed in the ♀ (but not quite as strong as in *molliaria*); narrowly pale costally, otherwise concolorous with forewing; a small but generally distinct cell-dot; the double postmedian straightish, close beyond it; distal area much as on forewing or slightly more clouded, the pale subterminal marking posteriorly reduced to a very broad zigzag line.

Underside with rather stronger and coarser dark irroration or strigulation,

similar or rather weaker markings, the whitish almost suppressed, the dark element of the postmedian only strong in the darkest-marked specimens (♀♀).

Kenya: Kiambu (R. H. Le Pelley), bred from larvae on coffee, December 1931, 6 ♂♂, 5 ♀♀; type and allotype in coll. Brit. Mus., received through the Imperial Institute of Entomology.

53. **Epigynopteryx glycera** sp. n.

♂, 31–32 mm. Face yellow below, the rest almost entirely suffused with reddish and fuscous. Palpus very little over 1, with similar colouring. Crown yellow. Antennal shaft mostly reddish, proximally mixed with fuscous, distally becoming pale; pectinations long. Collar reddish. Thorax and abdomen yellow, beneath pale. Hindtibia not dilated.

Forewing with costa arched, apex not acute, termen smooth, curved, anteriorly not oblique, posteriorly slightly so, tornus well expressed; SC^1 anastomosing at a point or connected by very short bar with C; clear yellow, without irroration; costal edge narrowly more buff; a fine, very slightly curved brown postmedian line from hindmargin at 7 mm. to R^1 scarcely over 2 mm. from termen: area outside it (excepting a very small backward projection of the yellow ground-colour at termen, which tapers to a point well before tornus) uniformly vinaceous-cinnamon; a small costal spot of the same colour close to apex separated off by a heavy blackish line; fringe yellow or ochre, generally rather darker than the wing.——*Hindwing* with termen smooth, curved, slightly more fully rounded in the middle but without angle or bend; postmedian line of forewing continued, almost straight across the wing to abdominal margin little behind middle; yellow proximally to the line, vinaceous-cinnamon distally; an extremely narrow yellow terminal area from costa, tapering as on forewing; fringe as on forewing.

Underside almost the same, but with the vinaceous parts rather paler; forewing with a few dark specks in anterior part and with a minute or microscopic cell-dot; hindwing with a blackish costal dot or small spot at boundary of the two colours.

Madagascar: Station Perinet, 149 km. E. of Tananarivo, January 1933 (Mme. N. d'Olsoufieff), 5 ♂♂ in coll. Tring Mus.

A very elegant little species, unique amongst the extensive *Epigynopteryx* material now known from Madagascar, especially in the entire absence of irroration.

54. **Trotogonia agelaea** sp. n.

♂, 28–30 mm. Near *pallidata* Warr. (1905), particularly as to the antennal structure, though the teeth may be a trifle stronger. Coloration much more as in *subornata* Warr. (1905), but with the vinaceous parts, especially on the upperside, cleaner, not dulled with violet-grey as in that species. Very distinct from both in the following particulars.

Forewing with the fine white antemedian almost vertical after the bend in cell (in all the other species of *Trotogonia* sinuous and oblique inward); a large and very conspicuous cell-spot, oblong and oblique, darker and more reddish than the ground-colour; the pale yellow postmedian patch freer from irroration; the dark fringe of the tornal excision inset with white both before and behind the fold, leaving blackish spots at the fold and at SM^2. *Hindwing* above without the three "purplish" or grey spots, beneath without the last (the radial) one.

Carabaya, S.E. Peru: La Oroya, 3,100 feet, 14 ♂♂, including the type; Rio Huacamayo, 3,100 feet, 2 ♂♂; cell in coll. Tring Mus. A ♂ from Chaquimayo in coll. Brit. Mus.

Of the other *Trotogonia* species I have seen few examples. The type, *subornata* Warr., remains unique; of *pallidata*, Ockenden only took the type (at Santo Domingo) and 3 larger ♂♂ (at Oconeque, 7,000 feet); of *niphe* (Th.-Mieg, 1907, as *Drepanodes*), described from Cayenne, I only know a good ♂ from Fonte Boa, in the Tring Museum.

To Warren's generic diagnosis (NOV. ZOOL., xi. 70) I would add that the face is smooth, the hindtibia (unless in the type, which has lost both hindlegs) strongly dilated, with hair-pencil, the inner proximal spur long, all the rest short, especially the two outer, the stalking of $SC^{1,2}$ of the forewing long, R^2 well before middle of DC.

55. **Ephoria auratilis** sp. n.

♂, 34–36 mm. Quite near *arenosa* (Butl., 1878) in shape and structure, the ♂ pectinations even more rudimentary (the longest ones shorter than the diameter of the shaft). Thorax, abdomen and wings brighter than in *arenosa*, the ground-colour almost pure deep-chrome.

Forewing in ♂ with moderate dark irroration costally and distally, in ♀ much clearer; cell-mark moderate; antemedian line less thick and more proximally placed than in *arenosa*, forming a regular and comparatively moderate curve; postmedian rather more distally placed than in that species, forking behind M^1 (rather variable in exact shape, much as in *arenosa*), remote throughout from antemedian: subapical white markings as in *arenosa*; ♂ with apical and terminal clouding, which in the ♀ is merely indicated.——*Hindwing* in ♂ with irroration in distal part, in ♀ clearer; median line straight from behind middle of abdominal margin to costa close to postmedian; postmedian slender or moderate, rather more sharply angled at radial fold than in *arenosa*; a blackish apical spot, not crossing the postmedian, in ♂ reaching at least to R^1, in ♀ very small.

Underside more evenly irrorated, with similar markings to upper, much less variegated than in *arenosa*.

W. China: Kwanhsien, 5 and 7 August 1926 and 4 August 1928; Yu Chi Valley near Kwanhsien, 20 July 1928 (G. M. Franck), 3 ♂♂, 1 ♀; type in coll. Brit. Mus.

56. **Devarodes paralogus** sp. n.

♂♀, 37–38 mm. Face white, overlaid (except at edges) with black-grey. Palpus black. Crown black, with a large orange central spot. Thorax above black; patagia mixed with white; tegula with an orange central spot and white edges. Abdomen above grey, mixed with black. Underside of body white, mixed with grey. Legs largely mixed with white.

Forewing with R^1 well stalked; black, with a roundish (slightly oval) white spot between SC^5 (=R^1) and R^3, bounded proximally by DC; fringe grey distally. ——*Hindwing* black: fringe mixed with white or whitish, the costal fringe the whitest.

Forewing beneath blackish, shading off to glossy drab costally and apically, the apical patch reaching R^3 and the white spot; proximal part of costa mixed with white; white spot of upperside extended to costa; in addition, a small subtriangular terminal spot in cellule 3. Hindwing dirty white with veins

darkened ; a very broad dark border (drab, mixed with darker shades), reaching cell and somewhat extended proximad anteriorly ; a subtriangular terminal spot in cellule 3.

Minas Geraes : Serra dos Cochos, 2 November 1919 (type), 31 December 1922 (paratype ♂ and allotype ♀), collected by J. F. Zikan, all in coll. Brit. Mus. ; a paratype ♂ from the same source in coll. L. B. Prout.

The upperside is extraordinarily like that of *Mnesipenthe subcana* (Walk., 1854) ; the hindwing beneath recalls those of *Devarodes subraria* (Walk., 1854), and its nearest allies.

57. **Hyalostenele lutescens auxomelas** subsp. n.

♂♀. Paler than *l. lutescens* Butl. (1872), from Mexico to Panama.——*Forewing* with veins M and M^2 blackened nearly to the junction, the abdominal margin blackened in (approximately) its distal half.——*Hindwing* with the veins almost entirely blackened (except DC), the abdominal margin as on forewing or narrowly blackened almost to base.

Peruvian Amazons : Rio Ucayali, 3 ♂♂, 2 ♀♀, the type ♂ from Contamana, in coll. Brit. Mus.

58. **Ereunetea translucens** sp. n.

♂, 32–33 mm. ; ♀, 35 mm. Face irregularly black above, white below, with a slight orange admixture at outerside. Palpus orange, with black tip. Antenna black, the pectinations continued to near apex. Head and body orange. Fore and middle legs largely blackish. Abdomen robust, especially in ♀.

Forewing not quite so narrow as in typical *Ereunetea* ; fovea strong, especially in ♂ ; cell long ($\frac{2}{3}$) ; R^2 scarcely nearer to R^3 than to R^1 ; thinly scaled, subdiaphanous ; orange, the brightest parts inclining to ochraceous-orange or zinc-orange, at some angles of light more rufous ; veins blackened, the discocellulars slightly more broadly so ; distal area pale blackish, in the middle suffusedly whitish, especially between SC^5 and R^3, the proximal boundary of the dark area fairly sharp at DC and anteriorly (where it runs obliquely inward), very vague and nearer the termen posteriorly. ——*Hindwing* with cell rather over $\frac{1}{2}$; concolorous with forewing, the borders narrower, with the whitish element strongest between R^3 and tornus.

Underside similar.

S. Cameroons : Bitje, Ja River, 2,000 feet, October–November (G. L. Bates), 3 ♂♂, 2 ♀♀, all in coll. Brit. Mus.

Rather aberrant in shape and scaling, but referable here. Evidently a member of a mimetic association, the distribution of the colours recalling the considerably larger, on the hindwing black-spotted *Acraea quirinalis* Gr.-Sm. and *iturina* Gr.-Sm., the general habitus more suggesting the Zygaenid moth *Anomoeotes tenellula* Holl. All these four species have been taken together.

59. **Craspedosis stenodes** sp. n.

♂, 44 mm. Very similar to *semiplaga* Warr. and *transtinens* Prout (see NOV. ZOOL., XXX. 209), especially, in the structural characters, to the latter. Fovea still stronger. Wings narrower. *Forewing* with costa straight from base to nearly $\frac{1}{2}$ (in *transtinens* more noticeably curved) ; the black ground-colour more strongly shot with blue, especially in proximal half ; the transverse white band,

as in *semiplaga laticlava*, terminating at SM^2, but shaped nearly as in *transtinens*. ——*Hindwing* almost throughout more strongly shot with blue than in the allies. ——Underside with the white band more sharply bounded distally than in *transtinens*, in which it is followed by a narrow area of an intermediate grey shade.

British New Guinea : Upper Aroa River, February 1903 (A. S. Meek).

60. **Craspedosis acoelia** sp. n.

♂, 39 mm. Almost exactly like *cyanauges* Prout (1916), but with the fovea vestigial, whereas in *cyanauges* it is very highly developed. The white band of the forewing a little more broadly and regularly rounded at the anterior end than is usual in *cyanauges* ; the underside with the metallic blue gloss more persistent, i.e. showing at a larger number of angles of vision and generally more extendedly.

Dutch New Guinea : Mt. Kunupi, Menoo Valley, Weyland Mountains, 6.000 feet, December 1920–January 1921 (C., F. and J. Pratt), 1 ♂ in coll. Tring. Mus., detected among a good series of duplicates from the Joicey Collection. It seems inconceivable that a mere atavistic *cyanauges* should depart so far from the normal structure ; moreover the colour peculiarity, though small, has shown itself constant over a long series from both Mt. Kunupi and Mt. Goliath, some in fresher, some in less fresh condition than the *acoelia* type.

61. **Milionia euchromozona** (Prout, MS.) Rothsch.

♂♀, 63–67. Structure and general habitus of *glaucans* Stoll (= *glauca* Cram.). Nearest to *assimilis* Rothsch. (NOV. ZOOL., iv. 510 ; x, t. 12, fig. 18, New Hanover), of which it may perhaps prove a form. Larger. Forewing with the band, even in the ♀ (in which the width within the cell is about twice that beyond it), broader, in the ♂ only reaching DC' in the middle, leaving small triangular patches of the ground-colour in the two outer corners of the cell ; colour of band red, almost as in *obiensis* Rothsch. (NOV. ZOOL., v. 417 ; x, t. 12, fig. 3), not orpiment-orange as in *assimilis*, only becoming weakly orange on the underside at its hindmargin. Proximal area beneath, especially in the ♂, strongly shot with blue, as in the Moluccan forms named ; in the ♀ this is restricted to the extreme base and streaks along C and SC (forewing only) and M (both wings, on the forewing very narrowly.

New Ireland, 2 ♂♂, 1 ♀, all in coll. Brit. Mus. (Joicey Bequest).

By a rather unfortunate contretemps, Lord Rothschild, in erecting *M. completa* Rothsch. (*Ann. Mag. Nat. Hist.* (9), xvii. 114), has unwittingly made himself sponsor to this species. Overlooking that it then existed only in manuscript, he used it in elucidating his new species and, mentioning the type locality, gave sufficient clues for its recognition. At the same time—quite naturally, under the circumstances—he provided no actual description ; hence it appeared to me that the only way in which to clarify the situation was by publishing my original description verbatim and subjoining the necessary explanations. As it is essential that the type of the species shall have been known to its author, I have labelled a ♂ in the Tring Museum as holotype.

62. **Nothofidonia ansorgei saphomeris** subsp. n.

♂, 33–38 mm. Differs from *a. ansorgei* (Warr., 1901, Uganda) in having the brown-black parts of the forewing almost solid, only with a very slight speckling of

the ground-colour at extreme costa and hindmargin ; the longitudinal central band variable, but always more or less narrow, on an average about 1·5 mm. in width ; the outer streak about R^1 likewise variable, occasionally obsolete or punctiform, usually short.

Kenya : Kitale, April 1926 (G. W. Jeffery), 14 ♂♂ in coll. Tring Mus., including the type. A ♂ from Lumbwa (Jeffery) in Brit. Mus. and one from Elgon dist. (F. Bryk) in my collection were formerly disregarded as mere abs. of *ansorgei*.

Differs from *xenoleuca* Prout (1928) in the yellow ground-colour, absence of black costal area of hindwing, etc.

63. **Semiothisa infabricata** sp. n.

♂, 28 mm. Frontal cone moderately strong. Palpus 1½. Antennal joints scarcely projecting ; ciliation just over 1. Hindtibia not dilated. Head and body concolorous with forewing ; fore- and midleg dark-mottled, especially the former.

Forewing with termen faintly waved, straightish (but not actually concave) anteriorly ; SC^1 arising from C ; SC^2 free ; rather pale brownish-drab, tinged, especially in distal area, with avellaneous ; dark irroration sparse and minute ; cell-mark faint, rather elongate ; median shade excurved slightly beyond it, incurved behind middle, rather strong at costa and hindmargin, weaker between ; lines extremely fine, not strong ; antemedian bent close to costa, then straightish ; postmedian oblique outward to R^1, here right-angled, then nearly parallel with termen, slightly approaching it posteriorly ; blackish marks on postmedian at R^3, the anterior minute, the posterior moderate ; a rather larger (sometimes elongate) spot outside the latter, separated from it by a whitish dash ; subterminal faint, interrupted ; termen with interneural black dots, the posterior two elongate ; fringe scarcely mottled.——*Hindwing* with termen straightish (hardly concave) between SC^5 and R^3, weakly bent at R^3 ; slightly greyer than forewing ; cell-dot less elongate ; median shade obsolete at costa, darkened at abdominal margin ; postmedian fine, not dentate, slightly excurved between the folds ; no dark spots at R^3 ; distal area nearly as on forewing.

Underside light brown, vaguely mottled with grey-brown and (especially on hindwing) with white, the veins on forewing distally and on hindwing more cinnamon ; cell-dots moderate, blackish ; median shade on hindwing crossing cell-dot ; a sayal-brown band outside the postmedian, on forewing mixed with grey posteriorly, on both wings enclosing some ill-defined white subterminal spots, those of forewing well developed only in cellules 6 and 7, those of hindwing ampler, only interrupted between the radials ; band of hindwing tapering towards tornus, leaving a triangular white mark between itself and the postmedian ; terminal spots fairly strong.

Nyasa : Zomba Plateau, November 1920 (H. Barlow), type ♂ ; Mt. Mlanje (S. A. Neave), a pair, larger but clearly conspecific ; all in coll. Brit. Mus.

Slightly variable, the ♀ a little recalling *duplicilinea* (Warr., 1897), the weakest marked underside (Mlanje ♂) suggesting the colour-scheme of *contaminata* Warr. (1902), the others more recalling *hypoleuca* (Prout, *Ann. Transv. Mus.*, v. 174).

64. **Semiothisa anguifera** sp. n.

♂, 36 mm. Face and palpus moderately infuscated, the former apparently without cone, the latter shortish-moderate. Antennal joints somewhat projecting, ciliation about 1, in paired fascicles. Thorax and abdomen slender, concolorous with wings. Hindtibia not dilated, the spurs long.

Forewing with apex sharp, termen oblique, straightish or faintly sinuous to a very slight, blunt prominence about R^3, thence considerably more oblique ; fovea weak ; $SC^{1,2}$ coincident, anastomosing very slightly with C ; pale (cartridge-buff or ivory-yellow), with fuscous lines or stripes, at their thickest parts almost 1 mm. ; a dark, heavy subbasal, oblique outward from hindmargin to M, thence less oblique and apparently much weaker ; an extremely oblique antemedian, curved in a long S-shape, arising at nearly $\frac{3}{5}$ costa, entering cell just behind the cell-spot, its posterior inward curve crossing the base of M^2, thickening between this and SM^2, its termination on middle of hindmargin slender ; postmedian less strongly curved, its anterior half being parallel with termen (at 3 mm.), its posterior sinus a little less deep than that of antemedian ; dark subterminal spots on SM^2 near tornus, between R^3 and M^1 close to postmedian line, and before R^1, indicating an oblique posterior shading to the pale apex ; interneural terminal dots.——*Hindwing* elongate costally, margin rather straight and oblique from C to SC^2, straightish between this and a second bend at R^3, faintly sinuous posteriorly ; whitish, slightly irrorated but without lines ; terminal dots present.

Forewing beneath with traces of lines, but best characterized by the apical markings : postmedian strong and broad from R^1 to costa, bounding a whitish apex and a purer white, very oblique streak from R^1 to SC^5, the latter bounded posteriorly (distally) by oblique dark shading. Hindwing beneath much more spotted and clouded than above ; a dark spot at costa proximally to middle, a highly sinuous median line arising from its distal end, some bright brown clouding about the veins, especially distally ; terminal marks heavy, more linear than above.

Uganda : Birunga Mountains, February 1933 (G. L. R. Hancock), type ♂ in coll. Brit. Mus., presented by the Imperial Institute of Entomology.

Structurally sound, but extremely worn ; the exceptionally striking pattern (somewhat reminiscent of some *Pseudomaenas*) will render it easy of recognition.

65. **Zamarada melpomene tragodica** subsp. n.

Distinguished from *m. melpomene* Oberth. (1912, Cameroons to Ivory Coast) by the much darker borders, which are quite uniformly Natal-brown to bone-brown, not variegated as in the name-typical race ; both upper- and underside without the whitish marks at hindmargin close to tornus ; cell-dots minute. Possibly a separate species.

Tanganyika Territory : Morogole (J. A. I. Thompson), type ♂ in coll. Brit. Mus., received through the Imperial Institute of Entomology.

As Gaede suspected (*Iris*, xxix. 117), Oberthür's statement that spurs are wanting on the ♂ hindtibia is an error of observation ; all four are long (though very unequally) and remarkably slender, so that when the strong hair-tufting is in good order they can be overlooked amongst it.

66. **Lomographa tritocampsis** sp. n.

♂♀, 20–23 mm. Head and body concolorous with wings, the collar and base of antenna somewhat darkened. Ciliation of ♂ antenna very long. Hindtibia of ♂ strongly broadened, with an elongate concavity on innerside, containing a striated area, the striations extremely fine, longitudinal.

Wings shaped about as in *lala* (Swinh., 1892); paler, approaching in colour *hyriaria* (Warr., 1894), but with the irroration less coarse, the markings less dark; costal edge of forewing slenderly dark, terminal line finer and weaker than in *hyriaria*; median line better developed than in *hyriaria* and very distinct from that of *lala* or of *urbica* (Swinh., 1885), being—especially on the forewing—very definitely angled outward at the hind corner of cell, more or less incurved before and behind the angle; the postmedian (weak in the whole group) obsolete; subterminal twice outbent, nearly as in *urbica* but with the anterior bend (at R^2) less deep; this line a little farther from termen than in *urbica*, running to hindmargin, not to tornus; longitudinal shades between subterminal and termen somewhat variable, generally more diffuse or less definite than in *lala*.

India, widely distributed: Khasis (type ♂ in coll. Tring Mus.), Nagas, Nepal (1 ♂ in Mus. Senckenberg.), Sikkim, S. Mangalore (Madras), Nilgiris, Ceylon.

67. **Peratophyga spilodesma** sp. n.

♂♀, 23–24 mm. Face deep brown. Palpus mixed with black on outerside, with buff within. Vertex clay-colour, dark-spotted. Antenna spotted; in ♂ with rather long pectinations to well beyond middle; in ♀ shortly ciliated. Collar and extreme front of thorax clay-colour; most of thorax and abdomen deep plumbeous, beneath paler, the abdomen with clay-coloured dorsal spots.

Forewing rather broad, termen little oblique anteriorly, gently curving posteriorly; deep plumbeous, the markings clay-colour, the bands less markedly suffused with ochraceous in the middle than in *flavomaculata* Swinh. (1902); an ill-defined subcostal streak from base to median band, thickening into a spot at $\frac{2}{7}$ to indicate the antemedian, which only reappears as a smaller spot on SM^2; median band slightly before middle, slightly curved, formed of three large spots which are slenderly connected by a line at their proximal side; a few scattered black scales in their centre; postmedian similar, midway between median and termen, rather broader and more sinuous, the spots curving outward, the connecting lines inward; minute subterminal vein-dots; fringe ochraceous at base and veins, otherwise deep plumbeous.——*Hindwing* with similar markings, except proximally.

Underside with the markings similar but paler, more buff.

Borneo: Bidi, Sarawak, 1907–8 (C. J. Brooks), type ♂ and allotype ♀ in coll. Brit. Mus.

68. **Pycnostega areta** sp. n.

♂, 25–29 mm. Nearly related to *fumosa* (Warr., 1897, as *Hydatocapnia*). Structure similar, i.e. with the antennal pectinations short, hindtibia strongly dilated with pair-pencil, forewing with SC^{1-2} coincident, generally free, R^2 from not or barely before middle of DC. Pectinations, however, a trifle shorter still (the longest not quite 2, in *fumosa* appreciably over 2).

Both wings, particularly the forewing, with costal margin relatively less shortened ; colour browner, more uniform, without the darkened distal area above or beneath ; cell-dots more sharply black, on forewing generally somewhat longer and narrower ; the denticulate postmedian line nearer to the termen (about 3 mm. therefrom) and much more nearly parallel to it, on the forewing showing only a very slight sinus inward behind M^2, on the hindwing a rather shallow one between the radials.

W. Kivu : south side of middle Lowa Valley, S. of Walikali, 3,500 feet, forest, March 1924, wet season 3 ♂♂ (including the type), 1 ♀ ; Upper Lowa Valley, near Masisi, 5,000–6,000 feet, forest and long grass, February 1924, wet season, 3 ♂♂, 1 ♀ ; Middle Lowa Valley, near Walikali, 3,000 feet, 3 ♂♂ ; also from E. Ituri Valley, 30 miles S. of Irumu, 3,000 feet, July 1924, 1 ♂. All collected by T. A. Barns, type and others in coll. Brit. Mus., paratypes in Tring Mus.

69. **Xenostega treptostiches** sp. n.

♂, 22 mm. Head and body concolorous with wings, the face, palpus and foreleg with some blackish admixture, the abdomen with blackish dorsal spots. Hindtibia dilated, with strong hair-pencil..

Forewing with SC^{1} from stalk of SC^{3-5}, anastomosing with C and with SC^{3} [1] (i.e. as in most *Xenostega* [1]), R^{2} from about one-third DC (about as in *tincta* Warr., 1899, which also has this vein less extremely displaced than in most *Xenostega*) ; fovea broad, heart-shaped, being indented distally by a small area with black scaling ; light grey, with some sprinkling of more silvery scales ; a small black cell-dot ; lines olive-brownish, all angled outward, the first in cell, the others at R^{1} ; antemedian twice as near to median as to base ; median rather thick, behind its angle deeply incurved so as to pass just proximally to the cell-dot ; postmedian about midway between median and termen, running slightly outward from fold to hindmargin ; beyond it (after a pale line) an irregular row of spots, only those between the radials and from M^{1} to hindmargin highly developed, these mainly black, brown-edged proximally, bordered distally by pale markings which indicate the position of the subterminal ; terminal black dots between the veins. —*Hindwing* with termen rather less full than in the typical species, yet hardly less than in *ochracea* (Butl., 1879, as *Crocinis* ; ♀ = *rimosaria* Saalm., 1891, as *Fidonia*) ; concolorous with forewing ; cell-dot more minute ; first line faint, rather nearer the base than on forewing ; others continuing those of forewing but somewhat slighter ; subterminal spots brown, much less developed than on forewing, but strengthened between costa and SC^{2}.

Forewing beneath slightly browner, except at hindmargin ; foveal spot and cell-dot developed ; subterminal spots larger but less sharply defined than above, slightly connected proximally by greyish shading ; no lines. Hindwing paler ; cell-dot faint as well as minute ; no markings except the costal subterminal spot and the terminal dots.

Madagascar : Station Perinet, 149 km. E. of Tananarivo, December 1932 (Mme. N. d'Olsoufieff), type ♂ in Tring Mus.

[1] Warren, NOV. ZOOL., vi, 301, writes " 11 out of 12," overlooking its very slender and weak base, which is here from near the end of the cell, anastomosing strongly with C, but in most of the species it is short-stalked.

70. **Xenostega eurhythma** sp. n.

♂, 24–26 mm.; ♀, 26–28 mm. Closely related to *ochracea* (Butl., 1879). Antennal pectinations of ♂ appreciably longer. Colour much paler and less ochreous.——*Forewing* with costal edge more uniformly red-brown, without thickening and blackening towards base (only the extreme edge sometimes blackish throughout); subterminal band more regular throughout, in the ♂ strong, generally thick, in the ♀ slenderer, in neither sex with the paired spots near tornus which characterize *ochracea*; other transverse markings almost or altogether obsolete.——*Hindwing* with a similar subterminal band, almost parallel with termen throughout; cell-dot sometimes almost obsolete.——Underside with similar distinctions.

Madagascar: Station Perinet, 149 km. E. of Tananarivo (Mme. N. d'Olsoufieff), 5 ♂♂, 3 ♀♀, in coll. Tring. Mus.

71. **Bapta araeophragma** sp. n.

♂, 30 mm. Face dark brown. Palpus rather lighter brown, mixed with white at base. Vertex and antennal shaft white. Thorax and abdomen white, above with dark irroration.

Forewing with apex not acute, termen slightly more oblique than in typical *Bapta*; SC^1 free, SC^5 stalked to beyond SC^2, M^1 connate; white, irrorated with brown-grey, a few of the scales nearly black; costal edge finely light ochreous-brown; cell-dot black, about as large as in *temerata* (Schiff.); a faintly suggested line just beyond middle of hindmargin, lost anteriorly; a weak but not very slender postmedian from SC^4 to hindmargin, rather nearer to termen than to cell-dot, very gently excurved in a great part of its course, slightly incurved posteriorly; an extremely fine black terminal line, strongest anteriorly, where it runs round apex to SC^3; fringe white, slightly greyer at tips. ——*Hindwing* with cell-dot smaller; postmedian line continued; terminal line not quite reaching tornus.

Underside white, with costal edge of forewing ochreous.

Borneo: Bidi, Sarawak, 1907–8 (C. J. Brooks), type in coll. Brit. Mus. Selangor: Kuala Kubu, Bukit Kutu, 3,400 feet, August 1918, 2 worn ♂♂ submitted by the Federated Malay States Museum.

Blaboplutodes gen. n.

Face slightly rounded, smooth-scaled. Palpus short and slender. Tongue developed. Antenna in ♂ (probably also in ♀) unipectinate, with very long branches. Femora not hairy. Hindleg slender, with four well-developed spurs. Wings subdiaphanous, the scaling thin and hair-like. Frenulum developed.——*Forewing* with apex rounded or round-pointed, termen smooth, curved, posteriorly strongly oblique; cell about $\frac{1}{2}$, DC little curved, $SC^{1\text{-}2}$ very long-stalked, their stalk arising from C, DC^1 well developed, R^2 from before middle of DC, M^1 stalked or connate. *Hindwing* with termen strongly rounded; cell about $\frac{2}{3}$, DC oblique posteriorly; C shortly approximated to cell near base, rather rapidly diverging, SC^2 separate, R^2 wanting, M^1 separate.

Type of the genus: *Blaboplutodes missilorum* sp. n.

Differs from *Plutodes* in the venation; the scaling is approached by that of *P. hilaropa* Meyr., *Tr. Ent. Soc. Lond.*, 1897, p. 75.

72. **Blaboplutodes missilorum** sp. n.

♂, 32 mm. Face above with a large dark spot in middle (abraded below). Palpus darkened on outerside. Crown and patagia pale yellow. Thorax above dark fuscous, posteriorly pale yellow; abdomen pale yellow, the first somite with a pair of subdorsal fuscous spots, the second with a single middorsal one, the rest with vague paired subconfluent ones. Foreleg infuscated on upperside.

Forewing very pale yellow, inclining to olive-buff; base and costal margin (to SC^{+1}) dark fuscous, projecting short dashes at 4 mm. (oblique outward), 11 or 12 mm. and 13 or 14 mm. (thin); a bent mark on DC^{1+2}; a terminal dash just in front of R^3; a row of small interneural terminal dots, with a larger one at apex and a still larger at tornus; 5 or 6 extremely faint, highly crenulate greyish lines. ——*Hindwing* with similar lines and terminal markings, the apical dot not enlarged; costal region free of dark markings.

Underside similar.

Rugege Forest, Ruanda District, Lake Kivu, 8,000 feet, December 1921 (T. A. Barns), type ♂ in coll. Brit. Mus.

The species must be very widely distributed, as the Tring Museum has a ♀ from Sédhiou, Senegal. A pair of a closely related species was sent to the Hill Museum from Nyasaland by Mr. H. Barlow. Very unfortunately, both the ♀♀ yet known have lost their antennae.

73. **Melinoëssa eurycrossa** sp. n.

♀, 45 mm. Head and body pale yellow, with some dusky markings, notably a narrowly dark band across upper part of face, some admixture on palpus and a large part of thorax above. Abdomen above marked with orange at base.

Forewing broad and relatively short, costa nearly straight, apex squared, termen rather strongly curved; maize-yellow, in places with a little orange irroration and a few dark scales; costal margin with extensive hair-brown and darker irroration and strigulation, which becomes almost solid shortly beyond the cell, and with a silvery subcostal streak; cell-ring small, long-oval, of the usual *Melinoëssa* colouring; two rather closely approximated orange (to cadmium-yellow) lines, rather broad but not concise; antemedian excurved, leaving costa at 4 mm. (blackish while crossing the irrorated area), reaching hindmargin at nearly 5 mm.; postmedian only just outside the cell, somewhat incurved before and behind the radials, from base of the median to hindmargin a little oblique outward; a very broad auburn border, its proximal boundary quitting SC 9 mm. from apex, bicurved (outward at first, then inward), finally running obliquely outward to hindmargin near tornus; contained in this border are a sinuous series of large, roughly triangular, silvery subterminal spots, silvery streaks in the veins and folds, a large maize-yellow terminal spot from R^2 to near M^2 and very slight orange maculation at apex and tornus; terminal line auburn; fringe nearly concolorous with border, whitish yellow opposite the terminal spot.——*Hindwing* moderately broad; cell-spot reduced, blackish, irrorated (not pupilled) with silver; lines still less defined, the postmedian shown as the boundary of the strongly orange-speckled proximal area; the first three silver subterminal spots very large, the one in cellule 3 small and inconspicuous, the last three fairly large; the dark colour of the border reduced to a broad edging of the first three spots, a broad streak running therefrom between the radials to termen, and some narrower

edging to the three posterior spots ; terminal line not complete ; fringe mostly pale, dark-mixed at the radials.

Underside with similar design but without silver ; the borders darker (Natal-to bone-brown), the pale parts of distal area white, the subterminal wanting, the costal markings of forewing vestigial.

Cameroons : Yaunde to Yoko road, 2,000 feet, July 1921 (G. L. Bates), type in coll. L. B. Prout.

Strikingly distinct from all the forms previously known.

74. **Melinoëssa asteria** sp. n.

♂♀, 43–46 mm. In structure typical—group of *croesaria* H.-Sch. (1855). Shape about as in that species, *midas* Prout (1922), etc., termen of forewing appreciably bent in the middle ; superficial aspect and even the colouring much more suggestive of *stellata* Butl. (1878), the pale buff ground-colour being retained on the forewing in a narrow antemedian band, two large, irregularly oval post-median patches (the first from SC^5 to R^2, tapering behind, the second longer, still more irregular, running from R^3 virtually to hindmargin, its proximal side more curved, its posterior part extremely attenuated, but not actually separated from the principal part as in *stellata*), and an ill-defined midterminal one, on the hind-wing in a postmedian patch from costa to near R^3, with an extremely attenuated continuation or resumption posteriorly, and slight or very slight apical and mid-terminal maculation, on both wings with some irregular buff strigulae on the brown parts ; both wings with conspicuous white, dark-edged cell-spot, the sub-terminal series of spots much as in *tanyglochis* Prout (1928), which, though rather broader-winged, is probably its nearest ally.——Forewing beneath marked nearly as above, though more blurred, the distal area with some dark admixture (less intense than in *tanyglochis* and *subalbida* Warr, 1905), the mid-subterminal white spot indicated, though less pure than the cell-spot. Hindwing beneath pale as far as the postmedian, but not so white as that of *subalbida* ; cell-spot indicated ; distal area moderately dark-clouded.

Cameroons : Bitje, Ja River, the type ♂ and others in Tring Mus. Gaboon : Ogove River, a dark ♂ in the same collection. Spanish Guinea, 2,500 feet (T. A. Barns), 1 ♂. E. Congo : Oso-Lowa watershed, 21 August (T. A. Barns), 1 ♂.

75. **Melinoëssa aureola** sp. n.

♂, 42–46 mm. ; ♀, 48–50 mm. Also very near *croesaria* H.-Sch., forewing (as in that species) with termen less noticeably bent than in *asteria*. Colour brighter orange-yellow than in any other *Melinoëssa*, the ground-colour clear yellow, the coarse and copious irroration and the markings bright red-orange. Front of thorax and costal margin of forewing heavily and rather broadly suffused with blackish.

Forewing with the white cell-mark rather narrow, its dark bordering rather strong ; both lines well developed ; antemedian strongly bent at (or just behind) the end of the darkened costal area, thence straightish ; postmedian slightly curved and running outward to an acute angle at (or just in front of) the mid-subterminal spot, strongly incurved between this and submedian area, where it changes its direction very slightly, to fall almost perpendicularly on hindmargin ; subterminal maculation nearly as in *croesaria*, the enlarged spot between R^3 and

M¹ moderate.——*Hindwing* with the black cell-dot rather sharp, generally touched with one or two silvery scales ; postmedian generally rather ill-developed, apparently about as in *croesaria* ; subterminal with central white spot materially larger than on forewing, generally subtriangular.

Underside with the dark markings more brownish than above ; hindwing in ♂ very little, in ♀ scarcely at all, paler than forewing ; the usual subterminal markings moderately strong on both wings, a good deal mixed with blackish, the pale mid-terminal spot well developed.

Sierra Leone (type ♂ in Tring Museum), Ivory Coast, Gold Coast and Nigeria, showing little variation.

From *sodaliata* Walk. (1862), abundantly distinct in the colour, the more extreme form of the postmedian line, the large mid-subterminal spot of the hindwing and the much paler hindwing beneath.

THE LYMANTRIIDAE OF KWANG-TUNG (S.E. CHINA).

By C. L. COLLENETTE.

(Plate X.)

THIS paper is based upon a very extensive collection made by Dr. Rudolf Mell in the province of Kwang-tung during the years 1908-1923, and submitted to me for determination by the kindness of Dr. Martin Hering, of the Zoological Museum, Berlin.

The total number of species listed is 81, some of which have not been recorded previously from China, while 10 are described as new. Over half of the previously known species appear to be identical with forms from Northern India, 8 were described originally from Formosan specimens, 7 from Japanese and 3 from Javanese.

The collection, including the types, has been returned to the Zoological Museum, Berlin, while paratypes and duplicate specimens have been presented wherever available to the Tring and British Museums.

Localities listed will be found on the map accompanying Dr. Mell's *Beitrage zur Fauna Sinica*, in *Arch. für Naturg.* 1922, Abt. A, Heft 10. Canton, Dingwushan, Lofaoshan and Lokong are in the tropical southern part of the province, the other localities in the subtropical northern portion. Kiukiang is still farther to the north.

Opportunity has been taken to include on the accompanying plate 7 new species from Chekiang and Kiangsu, described by me from specimens in the Höne collection (Zoological Museum, Berlin), and published in *Stylops*, iii, pp. 113–17, 1934.

Ridgway's *Color Standards and Color Nomenclature*, 1912, has been used for descriptions of colour in new species.

Stilpnotia leucoscela sp. nov. (pl. X, fig. 14).

♂. Palpus whitish, on the outer side ochraceous buff. Antennal shaft, body and legs white, pectinations of antenna pinkish buff. Wings and fringes white; a "watered silk" effect over the whole of the upperside of forewing, the bands close together and roughly at right angles to the inner margin, as in *S. moorei* Leech; a small sepia spot on the centre of the discocellulars.

♀. Resembles the ♂.

Expanse: ♂♂ 27–31 mm., ♀ 37 mm.

1 ♂ (holotype), 1 ♀ (allotype) and 1 ♂ (paratype), mountain forests south of Linping, July and October; 1 ♂ (paratype), Lungtaoshan, May; 1 ♂ (paratype), Mantsishan, July. Also represented in the Höne collection by a series of 4 ♂♂ and 6 ♀♀ from Chekiang.

Can be separated easily from the larger *Stilpnotia moorei* Leech by the white legs and white antennal shaft. In Leech's species the shaft and the tarsi of all legs are dark brown.

Arctornis alba Brem.

Aroa alba Brem., *Bull. Acad. Imp. des Sc. de St. Pet.* iii, p. 478 (1861).

1 ♂, Lungtaoshan, 25.vii ; 1 ♂, Fungwan, 11.xi.

Leucoma seminsula Strand (pl. X, fig. 6).

Leucoma seminsula Strand, Seitz' *Grossschm. d. Erde*, x, p. 309 (1914).

1 ♂, Canton.

This species appears to be rare, and the present insect is, I believe, the second specimen known. It is larger than the type, with an expanse of 38 mm., but otherwise answers reasonably well to Strand's description. I have included a figure.

Leucoma submarginata Wlkr.

Redoa submarginata Wlkr., *List Lep. Ins. B.M.* iv, p. 826 (1855).

3 ♂♂, Canton ; 2 ♂♂, Lofaoshan, 20.v and 9.x ; 3 ♂♂, mountain forests south of Linping, 17.vii (2) and 10.ix ; 1 ♂, 1 ♀, Lungtaoshan, 7.xi and 18.ix ; 1 ♂, 3 ♀♀, Mantsishan, 15.iv, 9.viii, 12 and 14.x ; 1 ♂, Samkong, 17.x.

These insects show variation in size, shape and degree of lustre, but appear to belong to a single species. Bred series from different parts of its reported range are required for further study.

Leucoma subvitrea Wlkr.

Leucoma subvitrea Wlkr., *List Lep. Ins. B.M.* xxxii, p. 344 (1865).

1 ♂, Lofaoshan, 20.iv ; 1 ♂, mountain forests south of Linping, 7.ix.

Leucoma comma Hutton.

Ocinara comma Hutton, *Trans. Ent. Soc. Lond.* (3), ii, p. 330 (1865).

1 ♂, Lungtaoshan, 21.ix.

Leucoma diaphora sp. nov. (pl. X, fig. 21).

♂. Palpus capucine yellow. Antennal shaft, thorax and abdomen pale ochraceous buff irrorated with Prout's brown, pectinations of antenna snuff brown, patagium pale pinkish buff. Head amber brown, between the eyes pale pinkish buff. Pectus, venter and legs pale pinkish buff, mixed on tibiae and tarsi with capucine yellow, and with a spot of Prout's brown at the centre of the fore tibia and at the base of the fore tarsus. Forewing pale ochraceous buff, irrorated evenly over the whole wing with Prout's brown ; discocellulars bordered heavily with Prout's brown ; a series of terminal interneural spots of Prout's brown from vein R^4 to vein M^3 ; fringe sayal brown. Hindwing pale ochraceous buff, irrorated, except in the costal and inner marginal areas, with Prout's brown ; discocellulars ringed with Prout's brown ; fringe sayal brown. Underside of both wings pale pinkish buff ; costal area of forewing irrorated with snuff brown ; fringes of both wings snuff brown.

Expanse : ♂♂ 37–38 mm.

1 ♂ (holotype) and 3 ♂♂ (paratypes), mountain forests south of Linping, August and September ; 1 ♂, Canton. Also represented in the Höne collection by one ♂ from Chekiang.

A very distinct species, nearest to *Leucoma micacea* Wlkr. (1862).

Caviria impressa Snell.

Leucoma impressa Snell., *Tijdschr. v. Ent.* xx, p. 8 (1877).

3 ♂♂, 1 ♀, Lofaoshan, 14, 19 and 21.x, and (♀) 26.vii.

I have not seen Snellen's type, but the present series answers well to his description and figure. The antennae are ochreous yellow with a white shaft.

Caviria parallela sp. nov. (pl. X, fig. 7).

♂. Palpus, head, thorax and abdomen whitish. Antenna Saccardo's umber (in some specimens the shaft towards the base whitish). Foreleg orange, banded narrowly on the tarsus with whitish ; middle and hindlegs whitish, the mid-tarsus orange, banded narrowly with whitish. Wings and fringes white, shining ; three " watered silk " bands crossing the upperside of forewing, parallel with each other and with the termen.

♀. Resembles the ♂.

Expanse : ♂♂ 37–41 mm., ♀ 44 mm.

1 ♂ (holotype) and 2 ♂♂ (paratypes), Canton ; 1 ♂ (paratype), mountain forests south of Linping, May ; 1 ♀ (allotype), Lungtaoshan, July.

Resembles *Caviria impressa* Snell., but with dark antennae in both sexes. The " watered silk " bands in the forewing are parallel with the termen, not oblique inwardly as in *C. clara* Wlkr.

Caviria ochripes Moore (?).

Stilpnotia ochripes Moore, *Lep. Coll. Atk.* p. 45 (1879).

5 ♂♂, 2 ♀♀, Lofaoshan, August.

I have seen no authenticated specimen of this species. The present insects appear to correspond to Moore's description, although not to the illustration in Seitz's *Grossschm. d. Erde*, x, pl. 39d.

Caviria crocoptera sp. nov. (pl. X, fig. 25).

♂. Palpus, thorax and abdomen whitish, forelegs missing in type. Antennal shaft white, pectinations tawny olive. Head xanthine orange, between the eyes whitish. Wings hyaline. In the forewing a patch of white scales on the centre of the discocellulars and a further patch at the lower angle of the cell ; fringe white.

Expanse : 38 mm.

1 ♂ (holotype), Mantsishan, at light, 12.viii.1915.

Resembles *C. dinawa* B.-Bak. in structure and general appearance.

Caviria melanoscela sp. nov. (pl. X, fig. 17).

♂. Palpus white, on the outer side fuscous black. Antennal shaft white, pectinations tawny olive. Head, thorax and abdomen white. Foreleg white, mixed on tibia, tarsus and inner side of femur with fuscous black ; hindleg white, mixed on tarsus with fuscous black, and with a spot of fuscous black distally on the tibia. Wings and fringes, above and beneath, white, the surface dull and non-shining ; apex and termen of forewing rather rounded.

♀. Resembles the ♂.

1 ♂ (holotype) and 1 ♀ (allotype), Shuiyuenshan, June ; 1 ♂ and 1 ♀ (paratypes), Lungtaoshan, September and July.

Characters to be noted in this species are the white shaft of the antenna, black on palpus and legs, rounded apex and dull non-shining surface of forewing. It is abundantly distinct from *Stilpnotia salicis candida* Stdgr., with which it seems to have been confused in the past.

Perina nuda Fabr.

Bombyx nuda Fabr., *Mant.* ii, p. 119 (1787).

2 ♂♂, 4 ♀♀, Canton, 8.ii (2), February, March and September; 1 ♀, Dingwushan, June; 4 ♀♀, Lofaoshan, May, June, October and December.

Topomesoides jonasii Butl.

Aroa jonasii Butl., *A.M.N.H.* (4), xx, p. 402 (1877).

1 ♂, Canton, 19.viii; 1 ♂, Lungtaoshan, 7.ix; 1 ♂, Tsahyuenshan, 29.vi.

Porthesia torasan Holl.

Artaxa torasan Holl., *Trans. Am. Ent. Soc.* xvi, p. 73 (1889).

1 ♂, Canton; 2 ♀♀, Mantsishan, 7 and 10.viii.

These insects do not appear to differ from Japanese specimens.

I have not seen the type of *P. tsingtauica* Strand (1910), but have little doubt that it is a well-marked specimen of this species.

Porthesia hoenei Collnt. (pl. X, fig. 13).

Porthesia hoenei Collnt., *Stylops*, iii, p. 114 (1934).

1 ♂, Kiukiang, September 1919.

Porthesia scintillans Wlkr.

Somena scintillans Wlkr., *List Lep. Ins. B.M.* vii, p. 1734 (1856).

1 ♂, 1 ♀, Canton; 2 ♂♂, Lofaoshan, 27.vii and 9.x; 1 ♀, Lungtaoshan, 7.vi; 2 ♀♀, Shuiyuenshan, 14.iv and 14.v.

Porthesia subnotata Wlkr.

Orvasca subnotata Wlkr., *List Lep. Ins. B.M.* xxxii, p. 502 (1865).

1 ♂, 1 ♀, Canton, the ♂ taken on 5.x; 1 ♂, Lofaoshan, 11.x.

Porthesia virguncula Wlkr.

Euproctis virguncula Wlkr., *List Lep. Ins. B.M.* iv. p. 836 (1855).

2 ♂♂, 1 ♀, Canton, 17.iv, 21.xi (2); 1 ♂, 2 ♀♀, Lofaoshan, 17.v, 26 and 27.vii; 1 ♂, Shuiyuenshan, 18.viii.

Euproctis intensa Butl.

Artaxa intensa Butl., *A.M.N.H.* (4), xx, p. 402 (1877).

1 ♀, Lofaoshan, 7.viii.

Euproctis flava Brem.

Aroa flava Brem., *Bull. Acad. Imp. des Sc. de St. Pet.* iii, p. 479 (1861).

3 ♂♂, 1 ♀, Canton; 5 ♂♂, 3 ♀♀, Lofaoshan, 10.iv, 18.vii, 10, 12 and 13.x, 6.v, 27.vi, 16.vii; 1 ♂, Mantsishan, 1.x; 2 ♂♂, Gaufung, 3 and 22.vi.

I have not seen Bremer's type, but the above insects correspond with the

description and with the series under that name in the British Museum collection. The spots in the apical area vary considerably in size and number.

Euproctis pseudoconspersa Strand (pl. X, figs. 2 and 3).

Euproctis pseudoconspersa Strand, Seitz' *Grossschm. d. Erde*, x, p. 345 (1923), nom. nov. for *E. conspersa* Butl., *Cistula Ent.*, iii, p. 117 (1885).

34 ♂♂, 41 ♀♀ Samkong and Tongchungshan, 30.x–9.xi ; 1 ♂, 1 ♀, Lungtaoshan, 2.vii and 28.vi ; 1 ♀, Canton.

The series of ♂♂ exhibits a perfect gradation in ground colour from bistre (ab. *choka* Strand, 1910) to light orange yellow. The ♀♀ are rather uniform, save for three or four specimens having, in addition to the usual single subterminal spots below veins R^4 and M^1, further single spots, small but distinct, below veins R^3, R^5, M^2 and Cu^2. A few other specimens have the two spots almost obsolete. A normal example, and another with the additional spots, are illustrated on plate x.

Euproctis staudingeri Leech.

Choerotriche staudingeri Leech, *Proc. Zool. Soc. Lond.* p. 624 (1888).

1 ♂, Lokong, 8.vi ; 1 ♀, Fungwan, 18.v.

Euproctis cryptosticta sp. nov. (pl. X, fig. 20).

♂. Palpus maize yellow. Antenna light buff. Head and thorax antimony yellow ; abdomen tawny olive, the anal tuft clay colour. Pectus, venter and legs light buff. Forewing maize yellow ; an antemedial fascia, bowed (concavity basad), lighter than the ground colour ; a postmedial fascia, lighter than the ground colour, bowed (concavity basad) from costa to below vein Cu^2, thence roughly at right angles to inner margin ; some fuscous irroration over two-thirds of the wing from the subbasal area to beyond the postmedial fascia, not reaching the costa and not invading the fasciae ; a round antimony-yellow spot on the discocellulars ; two rather large round fuscous-black subterminal spots, between veins R^4 and R^5, and M^1 and M^2 ; fringe maize yellow. Hindwing and fringe light buff. *Underside* of forewing light buff, lightly shaded in and above the cell with snuff brown ; fringe maize yellow. *Underside* of hindwing, and fringe, light buff.

♀. Resembles the ♂.

Expanse : ♂ 25 mm., ♀♀ 34–38 mm.

1 ♂ (holotype) and 1 ♀ (allotype), Samkong, x.1912 ; 1 ♀ (paratype), Lofaoshan, iv. 1912.

To be noted in this species are the antimony-yellow spot on the discocellulars and the two subterminal black spots in the apical area of the forewing.

Related to *Euproctis recurvata* Leech (1899).

Euproctis plana Wlkr.

Euproctis plana Wlkr., *List Lep. Ins. B.M.* vii, p. 1731 (1856).

1 ♂, 1 ♀, 21–23.iii, 2 ♀♀, 11–12.v, 2 ♂♂, 2 ♀♀, 27.x–2.xi, all taken at Canton ; 2 ♂♂, 2 ♀♀, Lofaoshan, 30.iv, 15.x, 30.iii and 20.viii ; 1 ♂, Lungtaoshan, 5.vii.

Euproctis bipunctapex Hmpsn.

Somena bipunctapex Hmpsn., *Ill. Het. Br. Mus.* viii, p. 57 (1891).

6 ♂♂ and 2 ♀♀, Canton, of which one ♂ and one ♀ were taken on 6.iv and 29.vi, 1 ♂ and 1 ♀, Teeberg, June and August.

Euproctis pauperata Leech.

Euproctis pauperata Leech, *Trans. Ent. Soc. Lond.* p. 138 (1899).
Euproctis parviplagiosa Gaede, Seitz' *Grossschm. d. Erde*, ii, Suppl. p. 104 (1932).

1 ♀, 12.vii, and 2 ♂♂, 1 ♀, 4.xi (2) and 3.x, all taken in mountain forests south of Linping; 1 ♀, Tsahyuenshan, 18.viii; 6 ♂♂, 6 ♀♀, Tongchungshan, 14–28.viii, and 1 ♀ on 1.xi.

Food plant *Bambusa* sp.

E. parviplagiosa Gaede was described from a series collected at Tien-tsuen, which is only 30–40 miles from Moupin, the type locality of *E. pauperata*. I have examined the types, and *E. parviplagiosa* must sink.

Euproctis seitzi Strand.

Euproctis seitzi Strand, Seitz' *Grossschm. d. Erde*, ii, p. 139, pl. 21g (1910).

1 ♂, 2 ♀♀, Canton, 30.xii, 15 and 22.iv; 1 ♀, Lofaoshan, 9.iv; 1 ♀, Lungtaoshan, 23.ix.

I have named these insects from Strand's original description, in which he speaks of the forewing as "light ochreous," and the abdomen above as "black or greyish black." The figure on plate 21g does not agree entirely with the description.

Euproctis flavinata Wlkr.

Artaxa flavinata Wlkr., *List Lep. Ins. B.M.* xxxii, p. 331 (1865).

2 ♂♂, Canton, 10 and 23.iv; 4 ♀♀, Canton, 17.iv, 20–26.vi; 1 ♀, Lofaoshan, 20.iv; 2 ♂♂, Fungwan, 13 and 14.v; 1 ♂, Gaufung, 5.vi; 1 ♀, Samkong, 20.x.

Euproctis subfasciata Wlkr.

Artaxa subfasciata Wlkr., *List Lep. Ins. B.M.* xxxii, p. 332 (1865).

3 ♂♂, 1 ♀, Lofaoshan, 18.iii, 17 and 18 (2) iv; 1 ♂, Lungtaoshan, 22.ix.

Euproctis bipartita Moore.

Chaerotricha bipartita Moore, *Lep. Coll. Atk.* p. 49 (1879).

1 ♀, Lungtaoshan, 28.viii; 1 ♀, Samkong, 24.v.

Euproctis quadrangularis Moore.

Chaerotricha quadrangularis Moore, *Lep. Coll. Atk.* p. 50, pl. ii, fig. 23 (1879).

1 ♀, Dingwushan, 27.iii; 1 ♀, Lofaoshan, 11.iv; 1 ♀, Lokong, 80 km. east of Canton, 12.iii.

This species was sunk by Hampson (*Fauna Br. Ind.*, i, p. 480) as a form of *E. marginata* Moore, and apparently as a result of a misidentification. The true *E. quadrangularis* is a very different insect to *E. marginata*, and is well portrayed in the original illustration.

Euproctis guttata Wlkr.

Artaxa guttata Wlkr., *List Lep. Ins. B.M.* iv, p. 795 (1855).

3 ♀♀, Canton, 12.vi (2) and 3.x ; 1 ♂, 2 ♀♀, Lofaoshan, 23, 28 and 30.iv.

Euproctis uniformis Moore.

Chaerotricha uniformis Moore, *Lep. Coll. Atk.* p. 49 (1879).

1 ♂, Canton ; 1 ♂, mountain forests south of Linping, 24.vi ; 1 ♂, Lungtaoshan, 10.x ; 1 ♂, Mantsishan, 9.viii.

Euproctis plagiata Wlkr.

Cispia plagiata Wlkr., *List Lep. Ins. B.M.* iv, p. 858 (1855).

1 ♀, Canton West.

In this insect, the light patch at the lower angle of the cell in the forewing is larger than in any Indian specimen that I have seen, and there is slight dark shading over a considerable area of the hindwing.

Euproctis magna Swinh.

Somena magna Swinh., *Trans. Ent. Soc. Lond.* p. 479 (1891).

1 ♂, Lofaoshan, 10.x.1915.

Euproctis kanshireia Wilem.

Euproctis kanshireia Wilem., *Entom.* 43, p. 286 (1910).

1 ♂, Canton ; 1 ♀, Teeberg, Linping, August ; expanse ♂ 29 mm., ♀ 37 mm.

Females of this species vary considerably in the amount of dark shading on the upperside of the hindwing.

Two males and three females taken at Tongchungshan in August and September are very considerably smaller (♂♂ 22–23 mm., ♀♀ 30–32 mm.), but cannot be separated on any other character. They perhaps represent a local race, but may be merely starved specimens.

Euproctis varia Wlkr.

Euproctis varia Wlkr., *List Lep. Ins. B.M.* iv, p. 840 (1855).

1 ♀, mountain forests south of Linping, 6.ix.

Euproctis unifascia Wilem.

Euproctis unifascia Wilem., *Entom.* 43, p. 287 (1910).

1 ♂, 1 ♀, Canton, the ♀ taken on 5.x ; 2 ♂♂, Lofaoshan, 6.iv and 27.vii.

In this species there may be considerable variation in the width and shape of the medial fascia.

Euproctis inornata Wilem.

Euproctis inornata Wilem., *Entom.* 43, p. 286 (1910).

2 ♂♂, Teeberg, 3 and 13.vii ; 1 ♀, mountain forests south of Linping, 23.iv.

The female has a conspicuous fuscous spot on the discocellulars of the forewing, which is missing in the males.

Euproctis angulata Mats.

Euproctis angulata Mats., *Journ. Coll. Agric. Hokkaido*, xix, p. 40 (1927).

1 ♂, Lofaoshan, 9.iv ; 1 ♂, 2 ♀♀, Mantsishan, 18.iv, 12 and 14.xi.

I have seen no Formosan specimen of this species, but the present series seems to correspond to Matsumura's description and illustration, supplemented by that of its synonym *E. sakaguchii* Mats. (1927).

Medama diplaga Hmpsn.

Euproctis diplaga Hmpsn., *Journ. Bombay Nat. Hist. Soc.* xx, p. 113 (1910).

1 ♂, Canton West.

This specimen is in poor condition, but does not seem to be distinguishable from Formosan specimens.

Aroa ochripicta Moore.

Aroa ochripicta Moore, *Proc. Zool. Soc. Lond.* p. 399 (1879).

2 ♂♂, 1 ♀, Canton, the ♂♂ dated 20.vi and 4.x ; 2 ♂♂, 1 ♀, Lofaoshan, 3 (2) and 19.iv ; 1 ♂, Teeberg, 16.v ; 2 ♀♀, Samkong, 14 and 21.v.

Numenes disparilis separata Leech.

Numenes disparilis separata Leech, *Entom.* xxiii, p. 112 (1890).

1 ♀, Canton West.

Numenes siletti Wlkr.

Numenes siletti Wlkr., *List Lep. Ins. B.M.* iii, p. 663 (1855).

1 ♀, Lungtaoshan, 3.vii.

Pseudodura dudgeoni Swinh.

Dasychira dudgeoni Swinh., *A.M.N.H.* (7) xix, p. 203 (1907).

4 ♂♂, Canton, two of which were taken on 27 and 29.i ; 1 ♂, mountain forests south of Linping, 12.vii ; 1 ♂, Lungtaoshan, 26.v.

Laelia anamesa Collnt.

Laelia anamesa Collnt., *A.M.N.H.* (10), xiii, p. 214 (1934).

1 ♂, 2 ♀♀, Canton ; 1 ♀, Lofaoshan, 27.vi ; 2 ♂♂, Lungtaoshan, 26.iv and 13.vii ; 4 ♂♂, Mantsishan, 15 and 18.iv, 17.vii and 3.x ; 1 ♀, Samkong, 12.viii.

The series resembles Siao-lou and Ta-tsien-lou (Szechwan) specimens. Both sexes vary greatly in size, and this species and others allied to it are difficult to determine. There are two spines of moderate size on the aedeagus.

Laelia suffusa Wlkr.

Ricine suffusa Wlkr., *List Lep. Ins. B.M.* iv, p. 824 (1855).

3 ♂♂, 2 ♀♀, Canton, 1 ♂ on 11.xi and 2 ♀♀ on 24.viii and 7.xi ; 1 ♀, Lofaoshan, 3.iv ; 2 ♀♀, Lungtaoshan, 19 and 21.vi ; 1 ♂, Gaufung, 24.vi.

Laelia phillipinensis Collnt.

Laelia phillipinensis Collnt., *A.M.N.H.* (10), xiii, p. 215 (1934).

1 ♂, 2 ♀♀, Canton, 6, 7 and 20.xi.1920.

Laelia atestacea Hmpsn.

Harapa testacea Moore (nom. praeocc.), *Lep. Coll. Atk.* p. 47 (1879). *Laelia atestacea* Hmpsn., *Fauna Brit. Ind.* i, p. 443 (1893).

1 ♂, Canton West ; 3 ♂♂, 2 ♀♀, mountain forests south of Linping, on *Musa* sp., October 1920 ; 1 ♂, Samkong, 14.x.

Dasychira dalbergiae Moore.

Dasychira dalbergiae Moore, *Proc. Zool. Soc. Lond.* p. 399 (1888).

2 ♂♂, 2 ♀♀, Fungwan, 17.viii (2), 26.vii and 14.viii.

This species and *D. mendosa* Hübn. are often confused. I have not seen examples of the latter from China.

Dasychira grotei Moore.

Dasychira grotei Moore, *Cat. Lep. Mus. E.I.C.* ii, p. 338 (1859).

3 ♂♂, 3 ♀♀, Canton, of which 2 ♂♂ and 1 ♀ were taken on 27.x, 6.xii and 18.xi ; 3 ♂♂, 1 ♀, Lofaoshan, 11.viii, 15 and 19.x and 25.x ; 1 ♂, Lungtaoshan, 15.xi ; 1 ♀, Mantsishan, 11.ii ; 1 ♀, Samkong, 25.vi.

Dasychira cerebosa Swinh.

Lymantria cerebosa Swinh., *Trans. Ent. Soc. Lond.* p. 483 (1903).

1 ♂, Dingwushan, March ; 1 ♂, 7 ♀♀, Mantsishan, March and August.

Dasychira pennatula Fabr.

Bombyx pennatula Fabr., *Ent. Syst.* iii, i, p. 465 (1793).

2 ♂♂, Canton, one of which was taken on 31.v ; 1 ♂, Lofaoshan, 6.vi.

Dasychira nigritula Wlkr.

Dasychira nigritula Wlkr., *List Lep. Ins. B.M.* xxxii, p. 360 (1865).

5 ♂♂, 3 ♀♀, Canton, April–June and October ; 5 ♂♂, Lofaoshan, April and October ; 6 ♂♂, 3 ♀♀, mountain forests south of Linping, July-September ; 1 ♂, 1 ♀, Tsahyuenshan, 29.v ; 6 ♂♂, 1 ♀, Mantsishan, April, July–September and November ; 1 ♂, Samkong, 10.v.

Dasychira glaucozona sp. nov. (pl. X, fig. 15).

♂. Palpus, antennal shaft, head, thorax, abdomen and foreleg sepia mixed with tawny olive, pectinations of antenna tawny olive, some sepia dorsal tufts on basal segments of abdomen. Pectus and venter, middle and hindleg, tawny olive. Forewing Saccardo's umber mixed with tawny olive ; a fuscous-black streak along the upperside of 2nd anal vein from base to antemedial fascia; dark antemedial and postmedial fasciae, running from costa to inner margin, not crenulated, the space between them dusted with pale drab grey, giving a bluish appearance ; reniform tawny olive bordered with fuscous black ; a fuscous-black subterminal fascia, with interneural streaks of the same colour running from the fascia to the termen between veins R^5, M^1 and M^2 ; in the anal angle a patch of fuscous black edged distally with whitish ; fringe Saccardo's umber, lighter interneurally. Hindwing and fringe Saccardo's umber. *Underside* of both wings tawny olive ; in and beyond the cell of forewing a shade of Saccardo's

umber, and a spot of the same colour on discocellulars of hindwing ; a rather prominent Saccardo's-umber postmedial fascia on both wings ; fringes Saccardo's umber, lighter at the vein-ends.

♀. Resembles the ♂.

Expanse : ♂♂ 31–32 mm., ♀ 44 mm.

1 ♂ (holotype) Canton, 20.viii ; 1 ♀ (allotype) Canton. Also, in the Höne collection, 1 ♂, West Tien-mu-shan, Prov. Chekiang, 1600 metres, 8.ix.

Somewhat resembles *D. flavimacula* Moore but smaller and with relatively broader wings, and with the fasciae on the forewing uncrenulated.

Dasychira nachiensis Marumo.

Dasychira nachiensis Marumo, *Essays Nawa*, p. 32 (1917).

1 ♀, Lungtaoshan, 9.vii.

I have seen no Japanese specimens of this species, but the present insect conforms to the description and figure. In the British Museum is a series from Assam which I have also included provisionally under this name. *D. nachiensis* must not be confused with *D. virescens* Moore, which has a narrow wavy preterminal fascia on the hindmargin in addition to the subterminal patches.

Dasychira melli sp. nov. (pl. X, figs. 10 and 22).

♂. Palpus, antennal shaft, head and thorax pale drab grey mixed sparsely with snuff brown ; palpus on outer side bistre ; pectinations of antenna tawny. Abdomen tawny olive mixed with tilleul buff. Pectus, legs and venter tilleul buff, the tibiae and tarsi spotted with bistre. Forewing with ground colour pale drab grey, mixed in varying degree with Saccardo's umber ; a heavy shading of Saccardo's umber in and above the cell, veins throughout the wing defined with the same colour and discocellulars faintly ringed ; a zigzag fascia inwardly oblique from the apex to a point below vein Cu^2, broadening in its passage, thence outwardly oblique to the inner margin near the tornus ; fringe pale drab grey marked interneurally with Saccardo's umber. Hindwing snuff brown, rather paler in basal and inner marginal areas ; a darker patch on the discocellulars ; fringe whitish. *Underside* of forewing snuff brown, fringe as on upperside. *Underside* of hindwing and fringe as on upperside, the patch on the discocellulars better defined.

♀. Resembles the ♂, but somewhat paler in coloration, and with a broad terminal shade (visible in nearly all specimens) on the hindwing.

Expanse : ♂♂ 37–44 mm., ♀♀ 51–52 mm.

1 ♂ (holotype) and 11 ♂♂ (paratypes) July. 1 ♀ (allotype) and 1 ♂ (paratype) September, 2 ♂♂ (paratypes) April, all from Lungtaoshan ; 5 ♂♂, 1 ♀ (paratypes), mountain forests south of Linping, March–July ; 1 ♂ (paratype) Mantsi-shan, July ; 1 ♂, Canton, April.

This very distinct species is also represented in the Höne collection by a good series of both sexes from Chekiang.

Dasychira orimba Swinh.

Olene orimba Swinh., *A.M.N.H.* (6), xiv, p. 435 (1894).

1 ♀, Lungtaoshan, 31.vii.

Dasychira angulata Hmpsn.

Dasychira angulata Hmpsn., *Trans. Ent. Soc. Lond.* p. 292 (1895).

3 ♂♂, Dingwushan, 29.iii ; 1 ♂, Lofaoshan, 30.xii ; 1 ♀, mountain forests south of Linping, 6.iv ; 1 ♂, Lungtaoshan, 4.ix.

Dasychira costalis Wlkr.

Melia costalis Wlkr., *List Lep. Ins. B.M.* iv, p. 808 (1855).

3 ♂♂, 3 ♀♀, Canton, May and June 1909.

I have compared this series with that in the British Museum from Java, and find that they entirely agree. The species occurs also in Burma.

Dasychira bhana Moore.

Dasychira bhana Moore, *Proc. Zool. Soc. Lond.* p. 804 (1865).

1 ♀, Lofaoshan, 6.viii.

This is the first Chinese specimen and the first female of the species that I have seen. The markings on the forewing are less distinct than in the male, and further material may show that it represents a separate subspecies.

Dasychira taiwana Wilem.

Dasychira taiwana Wilem., *Entom.* 43, p. 311 (1910).

1 ♂, mountain forests south of Linping, 14.v.1921.

The present specimen appears to be the first example known from China. A very closely allied species, *D. hirayamae* Mats., occurs in Japan.

Pida strigipennis Moore.

Lochana strigipennis Moore, *Lep. Coll. Atk.* p. 53 (1879).

1 ♀, Lungtaoshan, 19.vi ; 1 ♀, mountain forests south of Linping, 3.viii.

Cifuna locuples Wlkr.

Cifuna locuples Wlkr., *List Lep. Ins. B.M.* v, p. 1173 (1855).

2 ♀♀, Canton ; 2 ♂♂, Lofaoshan, 30.viii and 8.ix ; 1 ♀, mountain forests south of Linping, 30.ix ; 1 ♀, Mantsishan, 10.viii ; 1 ♂, Gaufung, 30.vi ; 1 ♂, Tongchungshan, 12.viii ; 1 ♂, Samkong, 14.ix.

Cifuna jankowskii glaucoptera subsp. nov. (pl. X, fig. 9).

Orgya jankowskii Oberth., *Et. d'Ent.* x, p. 13 (1884).

The insects before me are easily separable from *C. j. jankowskii* (Sidemi, Manchuria), but I think it advisable to treat them only as belonging to a geographical race.

The antemedial fascia on the forewing of both sexes is well defined, and its distal edge is straight, not curved or irregular as in *C. j. jankowskii*. Moreover the ground colour of the forewing is normally olive green, although in poor specimens it may fade to a shade of brown.

Expanse : ♂♂ 35–43 mm., ♀ 49 mm.

1 ♂ (holotype), 1 ♀ (allotype) and 7 ♂♂ (paratypes), Lungtaoshan, March, May July and October; 4 ♂♂ (paratypes), mountain forests south of Linping.

July, September–October ; 3 ♀♀, Mantsishan, June and September ; 1 ♂, 2 ♀♀, Samkong, May and October ; 1 ♂, Canton, November. The species is also represented in the Höne collection, from Chekiang.

Orgyia sp. (pl. X, fig. 5).

A single ♀ taken at Mantsishan on 28.ii.1917, with an expanse of 51 mm., agrees fairly well structurally with *Orgyia thyellina* Butl. (1881) and may be a large and poorly marked example of that species. However, *O. thyellina* has not been found previously outside Japan, and further material will probably show that the present specimen represents an undescribed form.

Orgyia postica postica Wlkr.

Lacida postica Wlkr., *List Lep. Ins. B.M.* iv, p. 803 (1855).

8 ♂♂, Canton, of which four were taken on 27.v, 29.vi, 28.x and 13.xi ; 1 ♂, 2 ♀♀, Lofaoshan, 9.v (2) and ii.x.

Pantana visum Hübn.

Pantana visum Hübn., *Zutrage Ex. Schmett.* iii, p. 33 (1825).

5 ♂♂, Canton ; 1 ♂, Lungtaoshan, 7.vii.

Larvae on *Bambusa* sp.

Strand, in Seitz' *Grossschm. d. Erde*, ii, p. 125, suggests that *P. ampla* Wlkr. (1855) (Hongkong) cannot be separated from *P. visum* Hubn., the type of which was stated by Hübner to come from Monte Video, but which is now assumed to have originated in Burma. I have compared a series of ♂♂ from Hongkong with others from Burma and the East Indies, and can find no distinguishing points in marking or genitalia. Although Hongkong specimens have usually been known as *P. ampla*, I now use Hübner's older name of *P. visum*.

Pantana sinica Moore (pl. X, fig. 12).

Pantana sinica Moore, *A.M.N.H.* (4), xx, p. 92 (1877).

2 ♀♀, Canton, of which one was taken on 28.iii ; 1 ♂, 1 ♀, Lungtaoshan, 18.iv and 9.vii ; 3 ♂♂, Tsahyuenshan, 25 and 28.iv and 26.vi ; 1 ♂, Gaufung, 24.iv.

The ♀ does not appear to have been described previously. It resembles the ♀ of *Pantana terminata* Wlkr., but with the dark spots in the angles of veins M^2 to Cu^2 considerably enlarged and almost filling the angles between the veins. These spots, together with a faint shade between veins M^1 and M^2 of the forewing, are the only markings on the wings.

Pantana limbifera Strand.

Pantana limbifera Strand, Seitz' *Grossschm. d. Erde*, ii, p. 125 (1911).

10 ♂♂, Fungwan, August–September ; 1 ♂, Mantsishan, 16.ix ; 9 ♂♂, Teeberg, August–September.

Strand described this insect on a single male from Chang-yang, as an aberration of *P. sinica* Moore, but after examination of the present series I have no hesitation in pronouncing it a distinct species.

One of the Teeberg insects has the whitish colour on both wings almost entirely suffused with snuff brown.

P. eurygania Druce (1899), known by a single male from Szechuan, Western China, and *P. droa* Swinh., known by a single male from Hongkong, closely resemble *P. limbifera*, but should be kept separate until further material can be examined from these localities.

Daplasa irrorata Moore.

Daplasa irrorata Moore, *Lep. Coll. Atk.* p. 52 (1879).

1 ♂, Canton; 1 ♀, Lofaoshan, 30.v; 1 ♂, 1 ♀, Lungtaoshan, 27.v and 9.vi; 1 ♂, Fungwan, 3.ix; 1 ♀, Mantishan, 26.v.

Lymantria mathura Moore.

Lymantria mathura Moore, *Proc. Zool. Soc. Lond.* p. 805 (1865).
Lymantria aurora Butl., *A.M.N.H.* (4) xx, p. 403 (1877).

1 ♂, Canton; 2 ♂♂, 5 ♀♀, Fungwan, 27.v–6.vi; 1 ♂, Teeberg, 20.vi; 8 ♀♀, Gaufung, 31.v–30.vi; 1 ♂, Samkong, 22.viii.

Lymantria xylina Swinh.

Lymantria xylina Swinh., *Trans. Ent. Soc. Lond.* p. 490 (1903).

1 ♀, Lungtaoshan, 7.vi; 2 ♀♀, Mantsishan, 13.vi–26.vii.

The type of *L. xylina* (Formosa), which is a male, is unique. The present series of ♀♀ agrees well with this insect, and I have little hesitation in assigning them to the same species. The ♀♀ of *L. apicebrunnea* Gaede (Ta-tsien-lou) are larger, and less heavily marked.

Lymantria marginata Wlkr.

Lymantria marginata Wlkr., *List Lep. Ins. B.M.* iv, p. 877 (1855).

1 ♀, Lungtaoshan, 30.viii.

Lymantria obsoleta iris Strand.

Lymantria obsoleta iris Strand, Seitz' *Grossschm. d. Erde*, ii, p. 130 (1910).

5 ♂♂, 7 ♀♀, Canton, April and October.

Lymantria nebulosa Wilem.

Lymantria nebulosa Wilem., *Entom.* xliii, p. 309 (1910).

3 ♀♀, Canton; 3 ♂♂, 2 ♀♀, April and October, Lofaoshan; 1 ♀, Mantsishan, 9.vi; 3 ♂♂, Gaufung, 25.v.

In this series, the male corresponds well with Formosan specimens, but the females have darker irroration and heavier markings on the forewing.

Lymantria roseola Mats. (?) (pl. X, fig. 4).

Lymantria roseola Mats., 6,000 *Insects of Japan*, p. 715, fig. 494 (1931), and *Insecta Matsumurana*, vii, 3, p. 138 (1933).

2 ♂♂, Lofaoshan, 25.v and 19.x; 1 ♀, mountain forests south of Linping, 26.iv.

The original description of this species related to a Formosan male, while the illustration is apparently that of a female. I have seen no example from Formosa, but the present specimens conform well to the description.

Lymantria polioptera sp. nov. (pl. X, fig. 19).

♀. Palpus fuscous, mixed sparsely with pale pinkish buff. Antennal shaft fuscous black, pectinations fuscous. Head and thorax pale pinkish buff mixed with fuscous; a narrow collar of geranium pink at the base of the patagium. Abdomen Saccardo's umber mixed with geranium pink. Legs fuscous, the foreleg banded on tibia and tarsus with whitish. Forewing whitish, irrorated over the whole wing with fuscous black; a spot of fuscous black at the upper angle of the cell, and a conspicuous line of the same colour along the lower half of the discocellulars; a conspicuous streak of fuscous black midway between the cell and the 2nd anal vein, running from below the junction of vein Cu^2 with the cell almost to the base of the wing; a rather faint subbasal and a crenate antemedial fascia; a crenate postmedial fascia, curved from costa to vein Cu^2, thence inwardly oblique to inner margin; some dark subterminal interneural lunules; a series of terminal interneural fuscous black spots, produced on to the fringe, which is otherwise whitish. Hindwing Saccardo's umber, darker in the terminal area; fringe whitish marked interneurally with fuscous. *Underside* of both wings Saccardo's umber mixed with whitish; darker markings on the discocellulars, and a faint postmedial fascia on the hindwing; fringes as on upperside.

Expanse: ♀♀ 57–64 mm.

1 ♀ (holotype) and 1 ♀ (paratype), Lungtaoshan, 28.ix and 23.v.

A male taken in Canton on 6.xi, and a pair in the Höne collection from Prov. Chekiang, appear to belong to this species. In the male the markings follow those of the female, the dark markings on the discocellulars and below the cell of the forewing are prominent, and the expanse is 34–36 mm.

This species resembles *L. lucescens* Btlr. of Japan, but is smaller, with distinct differences in markings. I have also compared it with *L. serva* Fab. of India and *L. serva iris* Strand of Hongkong. The female has a forewing grey in general appearance as against the brown colour of *L. serva iris*, while a comparison of the dark markings on discocellulars and below the cell will also serve to separate them.

Lymantria dispar asiatica Vnuk.

Lymantria dispar asiatica Vnuk., *Rev. Russe Ent.* xx, p. 79 (1926).

1 ♂, Canton, 1 ♂, Lungtaoshan, 31.v.

Lymantria dissoluta Swinh.

Lymantria dissoluta Swinh., *Trans. Ent. Soc. Lond.* p. 484 (1903).

2 ♂♂, 3 ♀♀, Canton; 4 ♂♂, 3 ♀♀, Lofaoshan, April, May and October; 1 ♀, Lungtaoshan, 3.vii; 1 ♀, Siuhang, 10.x; 7 ♀♀, Mantsishan, April, July and October; 1 ♀, Samkong, 17.x.

EXPLANATION OF PLATE X.

Fig. 1. *Dasychira glaucinoptera* Collnt. ♂ holotype. (*Stylops*, p. 117, 1934)
,, 2. *Euproctis pseudoconspersa* Strand. ♀ . . . . . p. 141
,, 3. ,, ,, ,, ♀ . . . . . p. 141
,, 4. *Lymantria roseola* Mats. (?) ♂ . . . . . p. 149
,, 5. *Orgyia* sp. ♀ . . . . . p. 148
,, 6. *Leucoma seminsula* Strand. ♂ . . . . . p. 138
,, 7. *Caviria parallela* sp. nov. ♂ holotype . . . . p. 139
,, 8. *Dasychira axutha* Collnt. ♂ holotype (*Stylops*, p. 117, 1934)
,, 9. *Cifuna jankowskii glaucoptera* subsp. nov. ♂ holotype . . p. 147
,, 10. *Dasychira melli* sp. nov. ♂ holotype . . . . . p. 146
,, 11. *Laelia monoscola* Collnt. ♂ holotype (*Stylops*, p. 116, 1934)
,, 12. *Pantana sinica* Moore. ♀ . . . . . p. 148
,, 13. *Porthesia hoenei* Collnt. ♂ holotype . . . . . p. 140
,, 14. *Stilpnotia leucoscela* sp. nov. ♂ holotype . . . . p. 137
,, 15. *Dasychira glaucozona* sp. nov. ♂ holotype . . . . p. 145
,, 16. *Porthesia coniptera* Collnt. ♂ holotype (*Stylops*, p. 115, 1934)
,, 17. *Caviria melanoscela* sp. nov. ♂ holotype . . . . p. 139
,, 18. *Stilpnotia cygnopsis* Collnt. ♂ holotype (*Stylops*, p. 114, 1934)
,, 19. *Lymantria polioptera* sp. nov. ♀ holotype . . . . p. 150
,, 20. *Euproctis cryptosticta* sp. nov. ♂ holotype . . . . p. 141
,, 21. *Leucoma diaphora* sp. nov. ♂ holotype . . . . p. 138
,, 22. *Dasychira melli* sp. nov. ♀ allotype . . . . . p. 146
,, 23. *Caviria chrysoscela* Collnt. ♀ holotype (*Stylops*, p. 114, 1934)
,, 24. ,, *sericea horridula* Collnt. ♂ holotype (*Stylops*, p. 114, 1934)
,, 25. ,, *crocoptera* sp. nov. ♂ holotype . . . . p. 139

NEW AND LITTLE-KNOWN CHINESE LYMANTRIIDAE.

Novitates Zoologicae XXXIX. 1934.

1933. South

A CHECK-LIST OF THE ORDER PROCELLARIIFORMES

By GREGORY M. MATHEWS.

INTRODUCTION.

IN presenting the Check List of the Petrels, I have striven to include every synonym to each genus, species and subspecies, and to designate a type to each genus and a type locality to each species and subspecies, where in the past one has not been assigned or assigned in error. As in all my previous Lists, every reference has been carefully examined. If any errors are apparent, I hope that readers will inform me at once; even printer's errors may cause trouble later on.

The admission of subspecies will always be a matter of opinion, but as no great hardship is imposed by their admission we can leave them to the "shifting sands." Whether more or fewer forms are admitted, we must record every primary reference; this I feel sure I have done.

In the formation of the Keys I have made use of the works of Coues, Ridgway, Salvin, Loomis and my own, supplemented by the articles and papers published by Murphy, Bannerman, Dabbene, Falla, Oliver, Stead, Peters and the names mentioned in the references. In working out the distribution I have also used the works of these authors and have noted odd distribution from time to time in stray works not mentioned.

I shall use this preliminary list as a basis for my future Monograph. I have placed *heinrothi* as a subspecies of *Alphapuffinus lherminieri*. One or two other innovations will be found in the List; these I hope will be discussed with the full facts taken into account.

In this order, when the sternum is notched, apparently it is double-notched. In Thalassidromidae and Pelecanoideidae the posterior margin of the sternum is entire, with only a very slight concavity in the outline of each side. In the remaining genera of the group the posterior border of the sternum is always more or less four-notched posteriorly, deepest in the Shearwaters and Petrels, less pronounced in the Fulmars.

Sternum notched in Diomedeidae and Procellariidae.

Sternum not notched in Thalassidromidae and Pelecanoideidae.

In the family Diomedeidae there exists, between the anterior ends of the mandibular rami, a narrow strip of horn, known as the inter-ramicorn, which is not found in Petrels outside this family.

As Coues says, the bill of the Tube-nosed Petrels consists of separate plates, divided by grooves; hind toe missing in Diomedeidae and Pelecanoideidae; only one joint in some genera, or even only a small pimple; anterior three toes large and fully webbed, non-diving except Pelecanoideidae; wing strong and pointed, of ten stiff primaries and many secondaries varying from 10 to 32; tail of less than 20 feathers. They differ in size from *Diomedea* to *Halocyptena*; no seasonal or sexual changes of their compact and oily plumage.

Food entirely of an animal nature gathered on the water; eject a repulsive oily substance when approached. [This may be for lightening the body before flight or for defence.] Breed in colonies; clutch single; are silent as a rule and only come to land for reproductive purposes, otherwise pelagic.

TUBINARES. TUBE-NOSED SWIMMERS.

SUPERFAMILY DIOMEDEOIDEA.

FAMILY DIOMEDEIDAE. ALBATROSSES.

Genus DIOMEDEA Linné.

Diomedea Linné, *Syst. Nat.* 10th ed. p. 132, Jan. 1st, 1758. Type (by subsequent designation, Gray, p. 78, 1840): *Diomedea exulans* Linné.

Albatrus Brisson, *Ornith.* vol. i, p. 54, vol. vi, p. 126, 1760. Type (by monotypy): *D. exulans* Linné.

Albatrossa Brünnich, *Zool. Fund.* p. 80, 1771. No species added. Type ("by implication"): *D. exulans* Linné.

Albatros Lesson, *Manuel d'orn.* vol. ii, p. 389, June 1828. Substitute name for *Diomedea* L.

Rhothonia Murphy, *Bull. Amer. Mus. Nat. Hist. Vol.* xxxvii, p. 861, Dec. 10th, 1917. Type (by original designation): *Rhothonia sanfordi* Murphy = *epomophora* Lesson.

Diomedea exulans exulans Linné (25–441). Wandering Albatross.

Diomedea exulans Linné, *Syst. Nat.* 10th ed. p. 132, Jan. 1st, 1758. Cape of Good Hope. (Fig. Gould, Austr. vii, pl. 38; Godman, pl. 89.)

"Chocolate Albatros" Latham, *Gen. Syn. Birds*, vol. iii, pt. 1, p. 308, 1785. South Seas: lat. 37° S., long. 50° W. (the end of December).

Diomedea spadicea Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 568, April 20th, 1789. Southern Ocean: lat. 37° S., long. 50° W. (founded on Latham's bird), off Montevideo.

Diomedea adusta Tschudi, *Journ. f. Ornith.* 1856, March, p. 157. South Pacific: 33° S. lat. and 89° W. long. off Juan Fernandez Island, Chile.

Diomedea chionoptera alexanderi Dabbene, *Hornero*, vol. 3, No. 4, Aug. 1926, p. 338. South Atlantic: lat. 38° 30′ S., long. 56° W.

Diomedea dabbenena Mathews, *Bull. Brit. Orn. Club*, vol. 1, p. 11, Oct. 31st, 1929. (New name for *Diomedea chionoptera alexanderi* Dabbene, not *Thalassogeron chrysostoma alexanderi* Mathews.)

Distr.: The species has been recorded at the Tropics and flies the waters of the Antarctic Ocean, breeding in each of the three oceans. Chiefly between the latitude of 65° South and the Tropic of Capricorn.

Breeding: Gough Island and Tristan da Cunha, in the South Atlantic Ocean.

Diomedea exulans chionoptera Salvin (25–443).

Diomedea chionoptera Salvin, *Cat. Birds Brit. Mus.* vol. xxv, p. 443 (pref. Dec. 16th, 1895), 1896. Kerguelen Island. (Fig. Godman, pl. 91; Mathews, pl. 369.)

Diomedea exulans westralis Mathews, *Bull. Brit. Orn. Club*, vol. xxxix, p. 29, Nov. 30th, 1918: Albany, West Australia.

Distr.: West Australian Seas, and Indian Ocean.

Breeding: Kerguelen Island, Marion, Prince Edward Island and the Crozets: St. Paul's Island, in the Indian Ocean.

Diomedea exulans rothschildi Mathews.

Diomedea exulans rothschildi Mathews, *Birds Austr.* vol. ii, pt. 3, p. 246, Sept. 20th, 1912. East Australian Seas. (Fig. Buller, 2nd ed. pl. 40; Math. pl. 95.)

Diomedea exulans rohui Mathews, *Austral Av. Rec.* vol. ii, p. 125, Jan. 28th, 1915. Sydney.

Distr.: East Australian and New Zealand Seas.

Breeding: On Disappointment Island, and on the west of Adams Island in the Auckland Group; and on the Chathams, and Antipodes Island off New Zealand, in the Pacific Ocean.

Diomedea exulans georgia Mathews.

Diomedea exulans georgia Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 214, May 27th, 1933. South Georgia.

Distr.: South Atlantic Ocean.

Breeding: South Georgia, Atlantic Ocean.

SUBGENUS **RHOTHONIA** Murphy.

Diomedea epomophora epomophora Lesson (25–443). Royal Albatross.

Diomedea epomophora Lesson, *Annales Sci. Nat. Paris*, vol. vi, p. 95, 1825. Campbell Island. (Fig. Godman, pl. 90; Mathews, Suppl. pl. 40.)

Diomedea empomophora Temminck and Laugier, *Planches Col. d'Ois*, 75th livr. Jan. 5th, 1828, p. 4, error for *epomophora* Lesson.

Diomedea regia Buller, *Trans. Proc. New Zeal. Inst.* 1890, vol. xxiii, p. 234, May 1891. Campbell Island, New Zealand.

Diomedea (Rhothonia) sanfordi Murphy, *Bull. Amer. Mus. Nat. Hist.* vol. xxxvii, p. 861, Dec. 10th, 1917. Off Corral, Chile.

Distr.: Australian and New Zealand Seas; flies the Pacific from New Zealand to Chile. Has been recorded at the Tropics.

Breeding: Campbell Island; Forty-fours Islands, south-east of the Chathams; the eastern end of Adams Island, south of Auckland Island.

Diomedea epomophora mccormicki Mathews.

Diomedea epomophora mccormicki Mathews, *Birds Austr.* vol. ii, pt. 3, p. 261, Sept. 20th, 1912. Enderby Island, Auckland Islands. (Fig. Mathews, Suppl. pl. 40.)

Distr.: Seas off Enderby Island north of the Auckland Group.

Breeding: Enderby Island to the north of Auckland Island.

Diomedea epomophora longirostris Mathews.

Diomedea epomophora longirostris Mathews, *Bull. Brit. Orn. Club*, vol. liv, p. 112, March 7th, 1934 South Atlantic Ocean.

Distr.: Flies the Atlantic Ocean, on the eastern side of South America, from the tropic of Capricorn to the Horn.

Breeding: Not known.

Genus **PHOEBASTRIA** Reichenb.

Phoebastria Reichenbach, *Nat. Syst. Vögel*, p. v, 1852 (1853). Type (by monotypy): *Diomedea brachyura* Temm. = *D. albatrus* Pallas.

Phoebastria albatrus (Pallas) (25–444). Short-tailed Albatross.

Diomedea albatrus Pallas, *Spic. Zool.* vol. 1, fasc. 5, p. 28, 1769. Off Kamchatka, Bering Sea. (Fig. Godman, pl. 92; Gould, vii, pl. 39.)

Diomedea brachiura Temminck and Laugier, *Planches Colores d'Ois*, 75th livr. Jan. 5th, 1828. In the article on the genus *Diomedea*, p. 11, for "Albatros de la Chine des Pl. Enl. 963 de Buffon"; cf. also 79th livr. Aug. 1829.

Diomedea chinensis Temminck, *Man. d'Orn*, 2nd ed. vol. i, p. cx, 1920, October (before 21st) for Pl. Enl. 963.

Diomedea leptorhyncha Coues, *Proc. Acad. Nat. Sci. Philad.* 1866 (for May), p. 178. No locality; designated China.

Diomedea derogata Swinhow, *Proc. Zool. Soc.* (Lond.) 1873, p. 786, April 1st, 1874. Chefoo, China.

Distr.: Occurs from South China, northward to Bering Sea, and then southward along the coast of America to California. That is, north of the Tropic of Cancer.

Breeding : Sulphur Island, Bonin Group. (Volcano Island ?) (It has been recorded as breeding on Wake Island.)

Phoebastria immutabilis (Rothschild) (25–446). Laysan Albatross or Gooney.

Diomedea immutabilis Rothschild, *Bull. Brit. Orn. Club*, vol. i, p. xlviii, June 1st, 1893. Laysan. (Fig. *Birds of Laysan*, p. 39 ; Godman, pl. 96.)

? Diomedea gilliana Coues, *Proc. Acad. Philad.* 1866 (for May), pp. 181–8. No locality.

Distr. : The North Pacific, with about the same distribution as *nigripes*, but has never crossed the line.

Breeding : The same breeding grounds as *nigripes* : Hawaiian Islands (Ocean, Green, Middle, Pearl and Hermes Reefs, Lisianski, Laysan, French Frigate Shoals, Necker, Bird and Johnston Islands). Formerly on Marcus Island.

Phoebastria nigripes (Audubon) (25–445). Black-footed Albatross.

Diomedea nigripes Audubon, *Orn. Biogr.* vol. v, pp. 327–8, 1839 (pref. May 1st). Pacific Ocean : lat. 30° 44′ N., long. 164° W. Sandwich Islands. (Fig. Godman, pls. 94–5.)

Diomedea gilbosa Gould, *Ann. and Mag. Nat. Hist.* vol. xiii, May 1st, 1844. North Pacific.

Phoebastria nigripes reischekia Mathews, *Bull. Brit. Orn. Club*, vol. li, Dec. 3rd, 1930, p. 29. New Zealand.

Distr. : North Pacific, north of the Line to the Aleutian Islands. Wandering in the non-breeding season as far south as New Zealand (one record).

Breeding : On the outer Hawaiian Island (Ocean, Green, Midway, Pearl and Hermes Reefs, Lisianski, Laysan, French Frigate Shoals, Necker, Bird and Johnston Islands). Formerly on Marcus Island, all between 30° and 15° N. lat.

Phoebastria irrorata (Salvin) (25–445). Galapagos Albatross.

Diomedea irrorata Salvin, *Proc. Zool. Soc. London*, 1883, p. 430, Oct. 1st. Callao Bay, Peru. (Fig. Godman, pl. 93.)

Dist. : The seas around the Galapagos Archipelago, east to Peru.

Breeding : Hood Island, Galapagos Archipelago.

Genus **THALASSARCHE** Reichenb.

Thalassarche Reichenbach, *Nat. Syst. Vögel*, p. v, 1852 (1853). Type (by original designation) : *Diomedea melanophris* Temminck.

Thalassarche melanophris melanophris (Temminck) (25–447). Black-browed Mollymawk.

Diomedea melanophris Temminck et Laugier, *Planches Colores d'Ois*, (? 77e) 76e livr. (vol. iv) pl. 456, April 23rd, (? March) 1828. Cape of Good Hope. (Fig. Godman, pl. 97 ; Gould, *Austr.* vii, pl. 43.)

Thalassarche melanophris belcheri Mathews, *Birds Austr.* vol. ii, pt. 3, p. 271, Sept. 20th, 1912. Kerguelen.

Distr. : From the Tropic of Capricorn, southward to 60° or 65° of South latitude.

Has been recorded from the British Isles and the Faeroes.

Breeding : Falkland Islands and South Georgia, South Atlantic Ocean ; Kerguelen Island, Indian Ocean.

Thalassarche melanophris impavida Mathews.

Thalassarche melanophris impavida Mathews, *Birds Austr.* vol. ii, pt. 3, p. 267, Sept. 20th, 1912, ex Solander MS.; Tasmania (Fig. Math. pl. 96).

Distr.: South-eastern Australian and New Zealand Seas to Campbell and Bounty Islands.

Breeding: Auckland Group (Disappointment Island): Campbell and Bounty Islands.

Thalassarche melanophris richmondi Mathews.

Thalassarche melanophris richmondi Mathews, *Birds Austr.* vol. ii, pt. 3, p. 272, Sept. 20th, 1912. West coast of South America.

Distr.: Off the west coast of South America.

Breeding: Ildefonso Island, off Chile.

Thalassarche bulleri (Rothschild) (25–448). Snares Island Mollymawk.

Diomedea bulleri Rothschild, *Bull. Brit. Orn. Club*, vol. i, pl. lviii, July 4th, 1893. New Zealand. (Fig. Buller, Suppl. pl. 5; Godman, pl. 98).

Diomedea platei Reichenow, *Orn. Monatsb.* vol. vi, p. 190, Nov. 1898. Cavancha, Chile [= ? immature of *bulleri*]. (Fig. Godman, pl. 98A.)

Distr.: Seas contiguous to its breeding place and as far east as Chile and Peru.

Breeding: Snares Island, South of Stewart Island, New Zealand.

Genus THALASSOGERON Ridgway.

Thalassogeron Ridgway, in Baird, Brewer and Ridgway, *Mem. Mus. Comp. Zool. Harvard*, vol. xiii, 1884. (*Water Birds of North America*, vol. ii,) pp. 345, 357, Intro. March 31st, 1884. Type (by original designation): *Diomedea culminata* Gould.

Thalassogeron chrysostoma chrysostoma (Forster) (25–451). Grey-headed Mollymawk.

Diomedea chrysostoma Forster, *Mém. Math. Phys. (Paris)*, vol. x, pl. 14, p. 571, 1785. Cape Seas. (Fig. Mathews, pl. 97.)

Thalassogeron chrysostoma harterti Mathews, *Birds Austr.* vol. ii, pt. 3, p. 280, Sept. 20th, 1912. Kerguelen Island.

Thalassogeron chrysostoma alexanderi Mathews, *Austral Av. Rec.* vol. iii, p. 55, April 7th, 1916. West Australia. (Fig. Math. pl. 97.)

Distr.: Generally between 40° and 60° of South latitude. Indian Ocean from Western Australia to the Cape. Records north of the line too doubtful.

Breeding: Kerguelen, Marion Island and the Crozets.

Thalassogeron chrysostoma culminata (Gould).

Diomedea culminata Gould, *Proc. Zool. Soc. Lond.* 1843, p. 107, Dec. 1843. Bass Strait. (Fig. Gould, *Austr.* vii, pl. 41; Godman, pl. 101.)

Diomedea culminata mathewsi Rothschild, *Bull. Brit. Orn. Club*, vol. xxxix, Feb. 28th, 1912, p. 70; Campbell Island.

Distr.: East Australian and New Zealand Seas.

Thalassogeron chrysostoma desolationis Salvadori.

Thalassogeron desolationis Salvadori, *Boll. Mus. Zool. Anat. Comp. Univers. Torino*, vol. 26, no. 638, p. 2, March 15th, 1911. Desolation Island, near Tierra del Fuego, S. of South America.

Diomedea profuga Mathews, *Birds Austr.* vol. ii, pt. 3, p. 285, Sept. 20th, 1913, 57° 30′ S., 1° 83′ W., S. of South America (not of Gray, 1871, p. 109, which is *N. chlororhynchus*.)

Distr. : Seas off the South of South America.

Breeding : Diego Ramirez Island, Cape Horn ; and South Georgia.

GENUS **NEALBATRUS** Mathews.

Nealbatrus Mathews, *Birds Austr.* vol. ii, pt. 3, p. 274, Sept. 20th, 1912. Type (by original designation) : *Diomedea chlororhynchos* Gmelin.

Nealbatrus chlororhynchus chlororhynchus (Gmelin) (25–451). Yellow-billed Mollymawk.

Diomedea chlororhynchos Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 568, April 20th, 1789. Cape Seas.

" Yellow-nosed Albatros " Latham, *Gen. Synops.* vol. iii, pt. i, p. 309, pl. 94, 1785. Cape of Good Hope.

Diomedea olivaceorhyncha Gould, *Ann. Mag. Nat. Hist.* vol. xiii, p. 361, May 1st, 1844. No locality Cape Seas.

Diomedea olivaceirostris Bonaparte, *Comptes Rendus, Acad. Sci. Paris*, vol. xlii, p. 768, April 28th, 1856 (new spelling only).

Diomedea presaga Bonaparte, *Consp. Gèn. Avium*, vol. ii, p. 185, Oct. 1st, 1857, as synonym of *D. chlororhynchus* Gm.

Diomedea profuga Gray, *Handl. Gen. Sp. Birds Brit. Mus.* vol. iii, p. 109, Aug. 18th, 1871, as synonym of *D. chlororhynchus* Gm.

Thalassogeron eximius Verrill, *Trans. Conn. Acad.* vol. ix, p. 440, pl. 8, for March (pub. after June) 1895. Gough Island (breeding).

Thalassogeron carteri Rothschild, *Bull. Brit. Orn. Club*, vol. xiv, p. 6, Oct. 30th, 1903. Point Cloates, mid-West Australia. (Fig. Math. pl. 99 ; Godman, pl. 102A.)

Distr. : Cape Seas, the Antarctic Ocean, commoner in the South Atlantic and Indian Oceans. Accidental, to Western Australia.

Breeding : Tristan da Cunha : Gough Island. (Crozets, Kerguelen and St. Paul's with a query).

Nealbatrus chlororhynchus bassi (Mathews).

Diomedea bassi Mathews, *Nov. Zool.* vol. xviii, p. 206, Jan. 31st, 1912. New South Wales. (Fig. Math. pl. 98 ; Godman, pl. 102.)

Distr. : Eastern Australian Seas.

GENUS **DIOMEDELLA** Mathews.

Diomedella Mathews, *Birds Austr.* vol. ii, pt. 3, p. 275, Sept. 20th, 1912. Type (by original designation) : *Diomedea cauta* Gould.

Diomedella cauta cauta (Gould) (25–449). White-capped Mollymawk.

Diomedea cauta Gould, *Proc. Zool. Soc. Lond.* 1840, p. 177, July 1841. Bass Strait. (Fig. Gould, *Austr.* vii, pl. 40 ; Math. pl. 100 ; Godman, pl. 99.)

Diomedella cauta rohui Mathews, *Austral Av. Rec.* vol. iii, p. 55, April 7th, 1916. Sydney.

Diomedella cauta wallaca Mathews, *Austral Av. Rec.* vol. iii, p. 160, June 25th, 1918. New name for *rohui*, as above.

Distr. : Australian (south and east) and New Zealand Seas.

Breeding : Albatross Island, N.W. of Tasmania : Mewstone Island, on the south coast of Tasmania.

Diomedella cauta salvini (Rothschild) (25–450).

Thalassogeron salvini Rothschild, *Bull. Brit. Orn. Club*, vol. i, p. lviii, July 4th, 1893. New Zealand. (Fig. Buller, Suppl. pl. 50; Godman, pl. 100.)

Thalassogeron layardi Salvin, *Cat. Birds Brit. Mus.* vol. xxv, p. 450, 1896 (pref. Dec. 16th, 1895). Cape of Good Hope, South Africa [error ? = Chile].

Diomedella cauta peruvia Mathews, *Bull. Brit. Orn. Club*, vol. liii, p. 185, May 5th, 1933. West Peru.

Distr.: New Zealand Seas, Bounty Island, and east to Chile and Peru in the Pacific Ocean. (Cape Seas in the Indian Ocean ?)

Breeding: Bounty Island, off New Zealand.

Diomedella cauta eremita (Murphy).

Thalassarche cauta eremita Murphy, *Amer. Mus. Nov.* no. 419, p. 4, April 5th, 1930. Pyramid Rock, Chatham Island.

Distr.: Seas round Chatham Island.

Breeding: Pyramid Rock, Chatham Islands.

Diomedella cauta atlantica Mathews.

Diomedella cauta atlantica Mathews, *Bull. Brit. Orn. Club*, vol. liii, p. 213, May 27th, 1933. Off Buenos Aires. South Atlantic Ocean: lat. 35° 44′ S.; long. 53° W., about 120 miles off the coast.

Distr.: Eastern Seas of South America from Uruguay to the Horn, South Atlantic Ocean.

Breeding: Not known.

Diomedella cauta steadi (Falla).

Thalassarche cauta steadi Falla, *Rec. Auckland Mus.* vol. i, no. 4, p. 179, Sept. 25th, 1933. Foveaux Strait, New Zealand.

Distr.: Foveaux Strait, New Zealand.

Breeding: Not known.

Genus **PHOEBETRIA** Reichenb.

Phoebetria Reichenbach, *Nat. Syst. Vögel*, p. v, 1852 (1853). Type (by original designation): *Diomedea fuliginosa* Gmelin = *Diomedea palpebrata* Forster.

Phoebetria palpebrata palpebrata (Forster). Light-mantled Sooty Albatross.

Diomedea palpebrata Forster, *Mém. Math. Phys. (Paris)*, vol. x, p. 571, 1785. "47° South lat." = 64° S. 38° E. = South of Prince Edward and Marion Islands.

Diomedea fuliginosa Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 568, April 20th, 1789. South Seas, 47°, for same as Forster's bird.

Diomedea antarctica Gray, *Gen. Birds*, vol. iii, p. 650, June 1844, as synonym of *D. fuliginosa* Gm. Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 186, Oct. 1st, 1857 = *fuliginosa* Gm.

Diomedea fuliginosa var. *cornicoides* Hutton, *Ibis*, July 1867, p. 186. South Indian Ocean, breeding on Kerguelen Island. (36° 28′ lat., 2° 18′ E. long. to 41° 9′ S. and 43° 7′ E. to 37° 26′ S. by 163° 51′ E.)

Distr.: South Indian Ocean.

Breeding: Kerguelen Island. This species breeds below the 45° of South latitude.

Phoebetria palpebrata huttoni Mathews.

Phoebetria palpebrata huttoni Mathews, *Birds Austr.* vol. ii, pt. 3, p. 297, Sept. 20th, 1912. New Zealand Seas. (Fig. Math. pl. 101.)

Phoebetria palpebrata audubani Nichols and Murphy, *Auk*, vol. 21, p. 531, Oct. 1914 = Sept. 30th. Mouth of the Columbia River, Oregon error = South Pacific Ocean.

Distr.: Southern Australian and New Zealand Seas.

Breeding: Sub-Antarctic Islands of New Zealand.

Phoebetria palpebrata murphyi Mathews and Iredale.

Phoebetria palpebrata murphyi Mathews and Iredale, *Man. Bds. Austr.* p. 50, March 9th, 1921, in text (South Georgia) new name for *antarctica* Mathews, 1912.

Phoeetria palpebrata antarctica Mathews, *Birds Austr.* vol. ii, pt. 3, p. 302, Sept. 20th, 1912. South Georgia. Not *Diomedea antarctica* Gray, 1844.

Distr.: South Atlantic Ocean.

Breeding: South Georgia.

Phoebetria [palpebrata] fusca (Hilsenberg) (25 453). Sooty Albatross.

Diomedea fusca Hilsenberg, in Froriep's *Notizen*, vol. iii, no. 5 (49), p. 74, Sept. 1822. Mozambique Channel. (Fig. Godman, pl. 103; Gould, vii, pl. 44; Mathews, Suppl. 41.)

Phoebetria fusca campbelli Mathews, *Birds Austr.* vol. ii, pt. 3, p. 304, Sept. 20th, 1912. Australian Seas.

Distr.: South Atlantic and South Indian Oceans from 30° West longitude to Western and Southern Australia. New Zealand record doubtful.

Breeding: Gough Island and Tristan da Cunha.

That is, above the 45° of South latitude.

SUPERFAMILY **PROCELLARIOIDEA.**

FAMILY **PROCELLARIIDAE.** Fulmars, Gadfly-petrels, Shearwaters and Prions.

SUBFAMILY **FULMARINAE.** THE FULMARS.

Genus **MACRONECTES** Richmond.

Macronectes Richmond, *Proc. Biol. Soc. Wash.* vol. xviii, p. 76, Feb. 21st, 1905. Type (by original designation): *Procellaria gigantea* Gmelin; new name for *Ossifraga* Hombron et Jacquinot, not Wood.

Ossifraga Hombron et Jacquinot, *Comptes Rendus Acad. Sci. Paris*, vol. xviii, p. 356, March 1844. Type (by monotypy): *P. gigantea* Gmelin. Not Wood, *Analyst*, vol. ii, p. 305, June 1835.

Macronectes giganteus giganteus (Gmelin) (25–422). Giant Fulmar.

Procellaria gigantea Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 563, April 20th, 1789. Staten Island, off Tierra del Fuego. (Fig. Godman, pl. 76 and Elliot, *Birds N. America*, vol. ii, pl. 59, 1869.)

"Giant Petrel" Latham, *Gen. Synops.* vol. iii, pt. ii, p. 396, 1785. Tierra del Fuego.

Proc(ellaria) Basilia Kuhl, *Beitr. Zool. vergl. Anat.* zweite *Abth.* p. 140, 1820 (pref. April 9th) as synonym of *Procellaria gigantea* Gm.

Procellaria ossifraga Forster, *Descr. Anim. ed. Licht.* p. 343, 1844 (pref. Jan.). Tierra del Fuego.

Procellaria gigas Huxley, *Proc. Zool. Soc.* (*Lond.*), 1867, p. 431, Aug. 1st; error for *gigantea*: and Forbes, *Rep. Voy. Challenger*, pt. xi, p. 8, 1882, new name of *Ossifraga gigantea*.

Macronectes giganteus solanderi Mathews, *Birds Austr.* vol. ii, pt. 2, p. 187, July 31st, 1912. Falkland Islands.

Macronectes giganteus halli Mathews, *Birds Austr.* vol. ii, pt. 2, p. 187, July 31st, 1912. Kerguelen.

Macronectes giganteus forsteri Mathews, *Birds Austr.* vol. ii, pt. 2, p. 189, July 31st, 1912. Valparaiso Bay, Chile.

Procellaria maxima Mathews, *Emu*, vol. xxxiii, pt. 2, p. 138, Oct. 2nd, 1933. As synonym of *M. gigantea* ex Anderson MS.

Distr. : The southern part of the three great Oceans, from the Tropic of Capricorn to the pack-ice. Seas off West Australia. Has been recorded north of the Tropic of Capricorn.

Breeding : South Shetland, South Orkney, South Georgia, Falkland Islands, Tristan da Cunha and Gough Island, in the South Atlantic : Kerguelen, Prince Edward and Crozet Islands in the Indian Ocean.

Macronectes giganteus albus (Potts).

Ossifraga alba Potts, *Trans. New Zeal. Inst.* vol. vi, p. 152, June 1874. Off Centre Island, Foveaux Strait, South Island, New Zealand. (Fig. Gould, *Austr.* vii, pl. 45 ; Math. pl. 89.)

Macronectes giganteus wilsoni Mathews, *Birds Austr.* vol. ii, pt. 2, p. 189, July 31st, 1912. Ross Sea, Antarctic.

Macronectes giganteus dovei Mathews, *Austral Av. Rec.* vol. iii, p. 54, April 7th, 1916. Sydney, New South Wales.

Distr. : New Zealand and Australian Seas to the Antarctic Ocean.

Breeding : Antipodes, Campbell, Chatham, and Macquarie Islands.

Genus **DAPTION** Stephens.

Daption Stephens, in Shaw's *Gen. Zool.* vol. xiii, pt. 1, p. 239, Feb. 18th, 1826. Type (by original designation) : *P. capensis* Linné. (Spelt *Daptes* Blasius, *List Birds of Europe*, p. 23, 1862.)

Calopetes Sundevall, *Math. Nat. Av. Disp. Tent.*p. 142 (before June 12th), 1873. New name for *Daption*.

Petrella Mathews, *Auk*, vol. xxxi, p. 91, Jan. 1st, 1914. Type (by monotypy) : *P. capensis* L. (ex Zimmermann in Bartram's *Trav. Carolina*, German ed. p. 293, 1793 (discarded as non-binomial.)

Daption capensis capensis (Linné) (25–428). Pintado, or Cape Pigeon.

Procellaria capensis Linné, *Syst. Nat.* 10th ed. p. 132, Jan. 1st, 1785. Cape of Good Hope. (Fig. Gould, vii, pl. 53 ; Math. pl. 90 ; Godman, pl. 80.)

Procellaria pardela Oken, *Lehrb. f. Naturg.* vol. iii, *Zool.* p. 533, 1816. Cape Seas.

Procellaria naevia Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 188, Oct. 1st, 1857, as synonym of *capensis*. *P. naevea* Coues, *Proc. Acad. Nat. Sci. Philad.* 1866 (for May), p. 162, as synonym of *capensis* L.

Distr. : Cape of Good Hope, Indian and South Atlantic Oceans. Mostly South of the Tropic of Capricorn.

Breeding : Kerguelen and Heard Island, South Indian Ocean ; Antarctica (Queen Mary, Adelie and King George V lands) ; South Shetland (Gerlashe Strait, North of Graham Land) South Orkney and South Georgia.

Daption capensis australis Mathews.

Daption capense australis Mathews, *Austral Av. Rec.* vol. i, p. 187, March 20th, 1913. New Zealand.

Distr. : Southern Australian and New Zealand Seas.

Breeding : Islands South of the Snares ? New Zealand.

Genus **FULMARUS** Stephens.

Fulmarus Stephens, in Shaw's *Gen. Zool.* vol. xiii, pt. i, p. 233, Feb. 18th, 1826. Type (by subsequent designation, Gray, *List Gen. Subgen. Birds*, p. 129, 1855) : *Procellaria glacialis* L.

Hebehippus Billberg, *Syn. Faun. Scand.* vol. i, pt. 2, p. 192, 1828. Type (by monotypy) : *P. glacialis* L., cf. *Austral Av. Rec.* vol. ii, pp. 42 and 48, October 23rd, 1913.

Rhantistes Kaup, *Skizz. Entwick-Gesch. Nat. Syst.* p. 105, April 1829. Type (by monotypy) : *Procellaria glacialis*.

Wagellus Gray, *Genera Birds*, p. 78, April 1st, 1840. Type (by original designation) : *P. glacialis* L.

Fulmarus glacialis glacialis (L.) (25–425). The Fulmar Petrel.

Mallemucke Martens, *Spitzbergische oder Groenlandische Reise Beschreibung gethan i. Jahr* 1671, p. 68, 1675. Spitsbergen.

Procellaria glacialis Linné, *Fauna Svecica*, 2nd ed. p. 51, after July 28th, 1761. Within the Arctic Circle = Spitsbergen. Founded on the above. (Fig. Godman, pl. 77.)

Hav-hesten, en Soe-Fugl, J. E. Gunnerus, *Trondh. Selskabs Skrifter*, Deel 1, pp. 182–202, pl. i, 1761.

Procellaria grönlandica Gunnerus, in Knud Leem, *Beskrivelse over Finmarkens Lapper*, p. 273, nota 121 (pref. Jan. 29th) 1767. Greenland. Founded on " Hav-hest." id. 1761.

Procellaria cinerea Gunnerus, *ib.* for " Hav-hesten," id. 1761 (ex Brisson).

Procellaria hyemalis Brehm, *Ornis*, vol. i, p. 20, 1824. Greenland.

Procellaria melanonyx Nilsson, *Skand. Fauna Foglarna* ed. 2, vol. ii, p. 347, 1835. Arctic Ocean.

Procellaria minor Kjärbolling, *Jour. f. Ornith.* 1854, *Erinnerungsschrift*, p. lix, 1855. Greenland.

Proc[*ellaria*] *borealis* Brehm, *Naumannia*, 1855, p. 296 (after June) as synonym of *P. glacialis* L.

Fulmarus auduboni Bonaparte, *Consp. Gen. Av.* vol. ii. p. 187, Oct. 1st, 1857 ; new name for *Procellaria glacialis* Audubon, *Orn. Biogr.* vol. iii, p. 441, error for p. 449, 1835. America, designated Newfoundland.

Procellaria glacialis communis Hartert, *Die Vögel der pal. Fauna*, vol. ii, Heft xi–xii, p. 1436, August 1920, as synonym of *glacialis* L. ex Brehm, *Verz. Samml. europ. Vögel*, p. 15, 1866 (nom. nud.).

Distr. : From the Tropic of Cancer, northward to the Arctic regions. Breeding north of 50°.

Breeding : Franz Josef Land ; Spitzbergen ; Novaya Zemlya ; Greenland, Ireland, England and the islands off Scotland (Shetland, Hebrides, Orkneys). North Atlantic.

Fulmarus glacialis rodgersi (Cassin) (25–427). The Glupisch or Pacific Fulmar.

Procellaria pacifica Audubon, *Ornith. Biogr.* vol. v, p. 331, 1839 (Indrod. May 1st), Alaska. Not Gmelin, p. 560, 1789, which is *Thyellodroma pacifica*. (Fig. Godman, pls. 78 and 79.)

Fulmarus rodgersii Cassin, *Proc. Acad. Nat. Sci. Philad.* for July–Sept. = Oct. 28th, 1862, p. 326. Indian Ocean error = North Pacific. (Fig. Godman, pl. 79.)

Fulmarus glacialis glupischa Stejneger, *Auk*, 1884, p. 234 (July), new name for *P. pacifica* Audubon not Gmelin. (Fig. Godman, pl. 78.)

Fulmarus glacialis columba Antony, *Auk*, 1895, April, p. 105. Off San Diego, California (in October).

Distr. : North Pacific to the Tropic of Cancer.

Breeding : North Pacific, in Bering Sea on Commander and Pribilof Islands ; Herald and Wrangle Islands ; Kamchatka and the Kurile Islands.

Genus **PRIOCELLA** Hombron and Jacquinot.

Priocella Hombron et Jacquinot, *Comptes Rendus Acad. Sci. Paris*, vol. xviii, p. 357, March 4th, 1844. Type (by monotypy): *P. garnotii*, Hombron et Jacquinot = *Fulmarus antarcticus* Stephens.

Priocella antarctica (Stephens) (25–393). Silver-grey Petrel.

Fulmarus antarcticus Stephens, in Shaw's *Gen. Zool.* vol. xiii, pt. 1, p. 236, Feb. 18th, 1826. Cape Seas. Based on *Procellaria glacialis* Latham, *Index Orn.* vol. ii, p. 823, Dec. 9th, 1790. (Fig. Gould, vii, pl. 48 ; Godman, pl. 43 ; Math., pl. 82.)

Procellaria tenuirostris Audubon, *Ornith. Biogr.* vol. v, p. 333, 1839 (Introd. May 1st). Columbia River, North America, error = South Pacific Ocean. Not of Temminck, 1835, which is *Neonectris tenuirostris*.

Procellaria glacialoides Smith, *Illustr. Zool. South Africa*, pl. 51, pt. xi, July 1840. Cape Seas.

Priocella garnotii Hombron et Jacquinot, *Comptes Rendus Acad. Sci. Paris*, vol. xviii, p. 357, March 4th, 1844. Cape Seas.

Procellaria smithi Schlegel, *Mus. Pays-Bas*, vol. vi, *Procell.* p. 22, July 1863. New name for *glacialoides*.

Thalassoica polaris Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 192, after Oct. 1st, 1857, as synonym of *glacialoides*, cf. Salvin, *Cat. Birds*, vol. xxv, p. 384 (pref. Dec. 1895), 1896.

Priocella antarctica addenda Mathews, *Austral Av. Rec.* vol. ii, p. 125, Jan. 28th, 1915. New Zealand Seas. (Fig. Math. pl. 82.)

Distr.: East Australian and New Zealand Seas to Antarctica. Ranges north in the Pacific to New Zealand and Peru and in the Atlantic to lat. 35° S., casually to Cape São Roque, Brazil and St. Helena Island.

Breeding: Queen Mary Land (Haswell Island); Adelie Land (Stillwell Island); King George's Island (Penguin Point); South Shetlands (Cape Roquemaurel West of Louis Philip Land); South Orkneys and South Georgia.

? *Procellaria maculata* Tschudi, *Journ. f. Ornith.* May 1856, p. 185, Mas-a-fuera Island. Indeterminable ?

Genus **THALASSOICA** Reichenb.

Thalassoica Reichenbach, *Nat. Syst. Vögel*, p. iv, 1852 (1853). Type (by original designation): *Procellaria antarctica* Gmelin.

Aeipetes Forbes, *Voy. 'Chall.' Zool.* p. 59, 1882. Type (by original designation): *Procellaria antarctica* Gm.

Thalassoica antarctica (Gmelin) (25–392). Antarctic Petrel.

Procellaria antarctica Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 565, April 20th, 1789. In the Antarctic Circle. (Fig. Godman, pl. 32, and Ereb. & Terr. pl. 33, Mathews, Lord Howe, pl. 37.)

Procellaria lugubris Tschudi, *Journ. f. Ornith.* May 1856, p. 185, as synonym of *Procellaria antarctica* Gm. Not of Bonaparte, 1845, which is *Thalassidroma pelagica* (L.)

Distr.: Antarctica to New Zealand and Victoria in Australia, never farther north.

Breeding: Queen Mary Land (Haswell Island); Adelie Land (Cape Hunter). South Shetlands [and South Orkneys ?].

Subfamily **BULWERIINAE.** The Gadfly Petrels

Genus **PAGODROMA** Bp.

Pagodroma Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 768, May 1856. Type (by monotypy): *Procellaria nivea* Forster.

Pagodroma nivea (Forster) (25–419). Small-billed Snowy Petrel.

Procellaria nivea Forster, *Voy. Round World*, vol. i, pp. 96–8, 1777 (pref. March 1st), lat. 52° S., long. 20° E. (Fig. Godman, pl. 73; Ereb. & Terr. pl. 34; Cassin, pl. 42; and Math. ii, p. 177; Mathews, Suppl. pl. 39.)

Procellaria candida Peale, *U.S. Explor. Exped.* vol viii, p. 295, in or before Oct. 1848: as synonym of *nivea* Forster.

Pagodroma nivea (*a*) *major* Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 192, Oct. 1st, 1857, as synonym of *nivea* Gm. = Forster.

Pagodroma nivea (*b*) *minor* Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 192, Oct. 1st, 1857, as synonym of *nivea* Gm.

Procellaria nivea minor Schlegel, *Mus. Pays-Bas*, vol. vi, *Procell.* p. 16, July 1863. South Pole.

Pagodroma nivea (*novegeorgica ?*) von der Steinen, *Internat. Polarforsch. Deutsche Exped.* vol. ii, p. 250, 1890. South Georgia.

Pagodroma novaegeorgica Salvin, *Cat. Birds Brit. Mus.* vol. xxv, p. 419 (pref. July 30th, 1895), 1896: as synonym of *nivea* Forster, ex Steiner, *Deutsch. Exp. Int. Polarf.* vol. ii, p. 250, 1890.

Pagodroma nivea novegeorgica Mathews, *Birds Austr.* vol. ii, pt. ii, p. 177, July 31st, 1912. Falkland Islands.

Pagodroma nivea falklandica Mathews, *Bull. Brit. Orn. Club*, vol. xlvi, Feb. 25th, 1926, p. 76 ("New name for *P. n. novegeorgica* Mathews, *Birds Austr.* vol. ii, p. 177, 1912, preoccupied as synonym of *nivea* Forster.")

Pagodroma nivea pealei Mathews, *Bull. Brit. Orn. Club*, vol. xlix, p. 19, Oct. 30th, 1928; lat. 64° S., long. 104° W. of Greenwich. (Fig. Math. Suppl. pl. 39).

Pagodroma nivea alba Mathews, *Bull. Brit. Orn. Club*, vol. xlix, p. 52, Dec. 27th, 1928: lat. 62° 52′ S., long. 159° 25′ E.

Distr.: The South Pole to Victoria in Australia; the South Pacific and South Atlantic Oceans. Recorded from Bouvet Island.

Breeding: Kaiser Wilhelm Land; Queen Mary Land; South Victoria Land (South Orkneys ? and South Georgia ?).

Pagodroma confusa Mathews. Large-billed Snowy Petrel.

Pagodroma confusa Mathews, *Birds Austr.* vol. ii, pt. 2, p. 177, and figure, July 31st, 1912. Cape Adare. (Fig. Mathews, Suppl. pl. 39.)

Distr.: Victoria Land, Antarctica.

Breeding: Cape Adare and Robertson Bay, South Pole; the South Shetlands (on the N.E. end of Ludwig Phillip Land; and Cockburn Island).

Genus **BULWERIA** Bp.

Bulweria Bonaparte, *Nuovi Annali d. Sci. Nat. Bologna*, Dec. 22nd, 1842, vol. viii, p. 426, Jan. 14th, 1843. Type (by monotypy and tautonymy): *Procellaria bulwerii* J. & S.

Bulweria bulwerii bulwerii (J. & S.) (25–420). Soft-nosed (or Bulwer's) Petrel.

Procellaria bulwerii Jardine & Selby, *Illustr. Orn.* vol. ii, pt. iv, pl. 65, Nov. 1828. Madeira. (Fig. Dresser, viii, pl. 614; Godman, pl. 74.)

Procellaria anjinho Heineken, in Brewster's *Edinburgh Journ. Sci.* New Series, vol. i, no. xi, p. 231, Oct. 1829. Madeira.

Puffinus columbinus Monquin-Tandon, in Webb, Berthelot and Monquin-Tandon, *Ornith. Canar.* vol. ii, p. 44, pl. 4, fig. 2, 1841. Canary Islands.

Procellaria columbina id, ib. pl. 4, fig. 2.

Distr.: North Atlantic, on the east from England to the Line.

Breeding: Madeira, the Salvages, Canary and Cape Verde Islands in the Atlantic.

Bulweria bulwerii pacifica M. & I.

Bulweria bulwerii pacifica Mathews & Iredale, *Ibis*, July 1915, p. 607. Bonin Islands.

Distr.: Bonin Island to Hawaiian Islands (Johnston, Nihoa, Necker, French Frigate Shoal, Laysan and Lisianski) and as far south as the Marquesa Group.

Breeding: The Hawaiian Group (Bird, Necker, French Frigate Shoal and Laysan); the Bonins (Volcano Island ?).

Genus **PTERODROMA** Bp.

Pterodroma Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 768, May 1856. Type (by subsequent designation, Coues, *Proc. Acad. Nat. Sci. Philad.* p. 137, 1866): *Procellaria macroptera* Smith.

Aestrelata Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 768, May 1856. Type (by subsequent designation, Coues, *Proc. Acad. Nat. Sci. Philad.* p. 137, 1866): *Procellaria haesitata* Kuhl.

Pterodroma macroptera macroptera (Smith) (25 399). Grey-faced or Great winged Petrel.

Procellaria macroptera Smith, *Illustr. Zool. South Africa*, pt. xi, pl. 52, July 1840. Cape Seas. (Fig. Godman, pl. 46.)

Procellaria atlantica Gould, *Ann. and Mag. Nat. Hist.* vol. xiii, p. 362, May 1st, 1844. Atlantic Ocean. Not of Bonaparte, 1824, which is *Cymochorea leucorhoa*.

Distr. : The Atlantic Ocean between South Africa and South America, and the Indian Ocean as far at least as the 80° of long. W.

Breeding : Tristan da Cunha and the Crozet Island ; and Kerguelen Island.

Pterodroma macroptera albani Mathews.

Pterodroma macroptera albani Mathews, *Austral Av. Rec.* vol. i, p. 30, April 2nd, 1912. Rabbit Island, Albany, West Australia. (Fig. Math. pl. 83.)

Distr. : Western Australian Seas.

Breeding : Rabbit Island, Albany, S.W. Australia.

Pterodroma macroptera gouldi (Hutton).

Oestrelata gouldi Hutton, *Ibis*, July 1869, p. 351. New Zealand.

Distr. : Eastern Australian and New Zealand Seas.

Breeding : Islands off New Zealand.

Pterodroma [**macroptera**] **aterrima** Bonaparte. Mascarene Petrel.

Pterodroma aterrima Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 191, Oct. 1st, 1857. Bourbon or Reunion Island, Mascarene Islands. (Fig. Godman, pl. 47.)

Procellaria carbonaria Bonaparte, ib. as synonym of *aterrima* Bp. ex Solander MS.

Distr. : The seas of the Mascarene Island (Reunion, Mauritius and Rodriquez), north to the Gulf of Aden.

Breeding : Bourbon (or Reunion) Island.

Pterodroma macgillivrayi (Gray) (25–421). Black-Fiji Petrel.

Thalassidroma (*Bulweria*) *macgillivrayi* Gray, *Cat. Birds Tropic Islands, Pacific Ocean*, p. 56, 1859 (1860). Ngau, Fiji Islands. (Fig. Godman, pl. 75.)

Distr. : Fiji Islands.

Pterodroma lessoni lessonii (Garnot) (25 401). White-headed Petrel.

Procellaria lessonii Garnot, *Ann. Sci. Nat. Paris*, vol. vii, p. 54, 1826. Falkland Island Seas.

Puffinus sericeus Lesson, *Man. d'Orn.* vol. ii, p. 402, 1828, June ; lat. 52° S., long. 85° W. South Pacific Ocean, west coast of Patagonia (collected by Coquille in 1825).

Distr. : Southern Oceans from a little south of the Tropic of Capricorn to the pack-ice. In the Indian and Atlantic Oceans.

Breeding : Falkland Islands, Atlantic Ocean : Kerguelen Island, Indian Ocean.

Pterodroma lessonii australis (Mathews).

Aestrelata lessonii australis Mathews, *Austral Av. Rec.* vol. iii, p. 54, April 7th, 1916. Sydney, New South Wales. (Fig. Buller, 1st ed. pl. 29; Gould, vii, pl. 49; Math. pl. 85; Godman. pl. 48.)

Procellaria leucocephala Forster, *Descr. Anim.* p. 206, Jan. 1st, 1844. Australian Seas. Not Kuhl, *Beitr. Zool. vergl. Anat.* p. 142, 1820 which is *Procellaria hasitata.*

Procellaria vagabunda Mathews, *Birds Austr.* vol. ii, pt. 2, p. 155, July 31st, 1912. Not Gray, *Gen. Birds*, vol. iii, p. 648, June 1844: as synonym of *lessoni.*

Distr.: Southern Australian and New Zealand Seas, Pacific Ocean.

Breeding: Antipodes, Auckland, Bounty and Macquarie Islands off New Zealand.

Pterodroma incerta (Schlegel) (25–405). Tristan Petrel.

Procellaria incerta Schlegel, *Mus. Pays-Bas*, vol. vi, *Procell.* July 1863, p. 9. Cape of Good Hope (Fig. Godman, pl. 53.)

Procellaria sandaliata Mathews, *Birds Austr.* vol. ii, pt. 2, p. 151, July 31st, 1912, 37° S. by 49° W. Not of Salvin in Rowley's *Miscell.* vol. i, p. 232, and 238, May 1876, as synonym of *arminjoniana.*

Pterodroma satalandia Mathews, *Bull. Brit. Orn. Club*, vol. liv, p. 25, Oct. 31st, 1933, new name for *P. sandaliata* Mathews.

Distr.: South Atlantic Ocean: from Rio to the Horn and east to the Cape: South Indian Ocean.

Breeding: Tristan da Cunha.

Pterodroma hasitata hasitata (Kuhl) (25–402). The Diablotin or Black-capped Petrel.

Procellaria hasitata Kuhl, *Beitr. Zool. vergl. Anat.* zweite abt. p. 142, 1820 (pref. April 9th), ex Forster. Type in Leyden Museum. No locality; designated Guadeloupe Island, Dominica. (Fig Godman, pl. 49.)

Procellaria leucocephala Kuhl, *Beitr. Zool. vergl. Anat.* zweite abt. p. 142, 1820 (pref. April 9th) as synonym of *P. hasitata* Kuhl.

Procellaria harlic Voigt, in Cuvier's *Thierreich*, vol. i, p. 913, 1831 (pref. Easter) new name for *hasitata.*

Procellaria diabolica Lafresnaye, *Rev. Zool.* 1844, p. 168, Guadeloupe Island.

Procellaria meridionalis Lawrence, *Ann. Lyc. Nat. Hist. New York*, vol. iv, p. 475, pl. xv, 1848 (after May 22nd). Florida.

Procellaria rubritarsi Newton, *Zoologist*, December, 1852, p. 3692, Swaffham, Norfolk (ex Gould MS.).

Procellaria mauping Nobel, *Bull. Comp. Zool. Camb. Mass.* vol. lx, no. 10, p. 372, Aug. 1916, as synonym of *hasitata* Kuhl, ex L'Herminier MS.

Distr.: Western Atlantic, around the West Indies, north to Virginia, New Hampshire, Kentucky, Ohio and Ontario; recorded for England (Norfolk) and Brazil.

Breeding: Lesser Antilles (formerly Guadeloupe, Dominica and Martinique, now the mountains of Hispaniola).

Pterodroma hasitata cahow (Nichols and Mowbray).

Aestrelata cahow Nichols and Mowbray, *Auk*, vol. xxxiii, p. 194, April 1916 = March 31st. South-east side of Castle Island, Bermuda. Formerly bred on Bermuda. Now extinct.

Pterodroma caribbaea Carte (25–403). Carribean White-rumped Petrel or Blue Mountain Duck.

Pterodroma caribbaea Carte, *Proc. Zool. Soc. London*, 1866, p. 93, pl. 10, June 1st. Blue Mountains, Jamaica. (Fig. Godman, pl. 50; Rothschild, *Extinct Birds*, pl. 37.)

Prion caribbaeum Carte, ib. p. 95, ex Mitchell MS.

Oestrelata jamaicensis "A. & E. Newton, *Handb. Jamaica*," p. 117, 1881 (cf. Morris, *Nature* for Dec. 15th, 1881, vol. xxv, p. 151). Jamaica: ex *Procellaria jamaicensis* Bancroft, *Zool. Journ.* vol. v, 1829, p. 81, after Feb. 1830. Summit of Blue Mountain Peak, Jamaica, a nomen nudum. Formerly bred on the Island of Jamaica. Now extinct.

Distr.: Formerly seas around the breeding localities.
Breeding: Formerly on Jamaica and Dominica.

Pterodroma rostrata rostrata (Peale) 25–404). Thick-billed Petrel.

Procellaria rostrata Peale, *U.S. Expl. Exped.* vol. viii, p. 296, in or before Oct. 1848, Tahiti, Society Islands. (Fig. Cassin, pl. 41; Godman, pl. 51.)

Distr.: Seas of the Society Islands.
Breeding: Society Island.

Pterodroma rostrata parvirostris (Peale).

Procellaria parvirostris Peale, *U.S. Expl. Exped.* vol. viii, p. 298, in or before Oct. 1848. Puka Puka= Honden, or Dog Island; Low or Paumotu Archipelago. (Fig. Cassin, pl. 40.)

Distr.: Paumotu Archipelago.

Pterodroma rostrata trouessarti Brasil.

Pterodroma rostrata trouessarti Brasil, *Bull. Mus. Hist. Nat Paris*, vol. xxii, for Dec. 1917, p. 432. (fig. in text), Jan. or Feb. 1918. New Caledonia.

Distr.: New Caledonia.
Breeding: New Caledonia.

Pterodroma rostrata becki Murphy.

Pterodroma becki Murphy, *Amer. Mus. Nov.* no. 322, p. 1, July 14th, 1928; lat. 155° E., long 3° S.

Distr.: East of New Ireland and north of Buka and Bougainville Islands, Solomon Group.
Breeding: Solomon Group (?) (New Ireland ?)

Pterodroma alba (Gmelin) (25–405). Small-billed Petrel.

Procellaria alba Gmelin, *Syst. Nat.* vol. i, pt. 2, p. 565, April 20th, 1789. Turtle and Christmas Islands = Christmas Island, designated type locality. (Fig. Godman, pl. 52.)

"White-breasted Petrel" Latham, *Gen. Synops. Birds*, vol. iii, pt. 2, p. 400, 1785. Turtle and Christmas Islands. Designated type locality, Christmas Island.

Procellaria variegata Bonnaterre, *Tab. Encyclop. Méth.* vol. i, p. 78, 1791. Named Latham's Bird from Christmas Island.

Oestrelata wortheni Rothschild, *Bull. Brit. Orn. Club*, vol. xii, p. 62, April 28th, 1902. Pacific Ocean: lat. 3° S., long. 118° 45′ W.

Aestrelata oliveri Mathews & Iredale, *Austral Av. Rec.* vol. ii, p. 113, Sept. 24th, 1914. Kermadec Islands.

Distr.: Central tropical Pacific Ocean, from north of the Line to a little south of the Tropic of Capricorn, even to 30° South.

Breeding: Christmas Island, Phoenix and Canton Islands: Marquesas and Ducie Islands.

Pterodroma magentae (Giglioli & Salvadori) (25–407). Magenta Petrel.

Aestrelata magentae Giglioli & Salvadori, *Ibis*, Jan. 1869, p. 61, lat. 39° 38′ S., long. 125° 58′ W. South of Pitcairn and Ducie Islands. (Fig. Godman, pl. 55; Rowley, *Misc.* pl. 30.)

Distr.: South Pacific.

Breeding: Not known.

Pterodroma inexpectata (Forster) (25–414). Mottled Petrel.

Procellaria inexpectata Forster, *Descr. Anim. ed. Licht.* p. 204 (pref. Jan. 1st), 1844. Seas south of New Zealand. (Fig. Buller, 2nd ed. pl. 41; Godman, pl. 68; Math. vii, pl. 369.)

Procellaria gularis Peale, *U.S. Explor. Exped.* vol. viii, *Birds*, p. 299, in or before Oct. 1848; lat. 68° S., long. 95° W. (near Peter Island off Alexander Land).

Procellaria raolensis Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 189, Oct. 1st, 1857; as synonym of, *P. inexpectata.*

Procellaria affinis Buller, *Trans. New Zeal. Inst.* 1874, vol. vii, p. 215, July 1875. Otago, New Zealand.

Aestrelata fisheri Ridgway, *Proc. U.S. Nat. Mus.* vol. v, 1882, p. 656, June 26th, 1883. St. Paul, Kodiak Island, Alaska.

Aestrelata scalaris Brewster, *Auk*, vol. iii, p. 390, July 1896, interior of New York State, United States of North America.

Procellaria lugens Mathews, *Birds Austr.* vol. ii, pt. 2, p. 159, July 31st, 1912. Tierra del Fuego (ex Solander), not Kuhl, 1820, which is *Paranectris griseus* Gm.

Pterodroma inexpectata thompsoni Mathews, *Austral Av. Rec.* vol. ii, p. 125, Jan. 28th, 1915. Tasmania. (Fig. Math. vii, pl. 369.)

Pterodroma neglus Mathews, *Bull. Brit. Orn. Club*, vol. xlix, Dec. 27th, 1928, new name for *Procellaria lugens* Mathews, 1912. Not Salvin, in Rowley's *Miscell.* vol. i, p. 235, May 1876, nor Gray, *Gen. Birds*, vol. iii, p. 648, June 1844, which is *Pterodroma brevirostris.*

Distr.: South Pacific Ocean off New Zealand, northwards to Alaska and Aleutian Islands. From the pack-ice in the south to nearly the same degree in the northern hemisphere. Occasionally off the Tasmanian Seas.

Breeding: On the islands off the south of New Zealand, Preservation Inlet (Akaroa) and Puysegur Point and islets off Stewart Island (Soloman, Cundy and Big South Cape Islands). The Snares, Chatham and Bounty Islands, New Zealand.

Pterodroma melanopus (Gmelin) (25–410). Bird of Providence or Brown-headed Petrel.

Procellaria melanopus Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 562, April 20th, 1789. North America error = Norfolk Island. (Fig. Math. ii, pl. 84; Godman, pl. 61.)

Procellaria grisea Bonnaterre, *Tabl. Encyclop. Méth.* vol. i, p. 75, 1791. Norfolk Island. Not Gmelin *Syst. Nat.* pt. ii, p. 564, 1789, which is *Paranectris griseus.*

Procellaria solandri Gould, *Ann. & Mag. Nat. Hist.* vol. xiii, p. 363, May 1st, 1844. Bass Strait.

Procellaria phillipii Gray, *Ibis*, July 1862. Norfolk Island.

Procellaria agilis Gray, *Hand-l. Gen. Spec. Birds B.M.* pt. iii, p. 106, Aug. 18th, 1871: (pref. July 8th) as synonym of *phillipii* Gray.

Oestrelata montana Hull, *Proc. Linn. Soc. N.S.W.* vol. xxxv, p. 785, March 1st, 1911. Lord Howe Island.

Procellaria providentia Mathews, *Birds Norfolk and Lord Howe Islands*, p. 18, Oct. 16th, 1929. Norfolk Island.

Distr.: From East Australia almost across the Pacific Ocean to Ducie Island.

Breeding: Formerly on Norfolk Island, now Lord Howe Island; the Paumotu and the Austral Groups.

Pterodroma brevirostris (Lesson) (25-409). Short-billed or Kerguelen Petrel.

Procellaria brevirostris Lesson, *Traité d'Orn*, livr. 8, p. 611, June 11th, 1833: no loc. Designated type locality Kerguelen Island. (Fig. Godman, pl. 60; Math. Suppl. pl. 38.)

Proc(ellaria) lugens Gray, *Gen. Birds*, p. 648, June 1844, as synonym of *Pterodroma brevirostris* (Lesson). Ex Solander MS. (Not Kuhl, 1820, which is *Paranectris griseus*.) See also *Ann. & Mag. Nat. Hist.* vol. xiii, p. 364, May 1844.

Oestrelata kidderi Coues, *Bull. U.S. Nat. Mus.* no. 2, p. 28, Nov. 1875. Kerguelen Island.

Procellaria unicolor Coues, ib., as synonym of *kidderi* Coues (ex Gould).

Distr.: South Atlantic and South Indian Oceans from West Australia, westwards to Tristan da Cunha and South America: south to the pack-ice.

Breeding: Kerguelen.

Pterodroma mollis mollis (Gould) (25-406). Soft-plumaged Petrel.

Procellaria mollis Gould, *Ann. & Mag. Nat. Hist.* xiii, p. 363, May 1st, 1844. South Atlantic Ocean. (Fig. Gould, *Austr.* vii, pl. 50; Math. pl. 86; Godman, pl. 54.)

Pterodroma dubius Mathews, *Bull. Brit. Orn. Club*, vol. xliv, p. 70, March 31st, 1924. North Australia? error = Indian Ocean.

Pterodroma deceptornis Mathews, *Nov. Zool.* vol. xxxviii, p. 34, Dec. 1932: lat. 36° 8′ S., long. 88° 55′ E. = New Amsterdam, and St. Paul's Islands, breeding.

Distr.: South Atlantic and Indian Oceans to Western Australia.

Breeding: Tristan da Cunha and Gough Islands, Atlantic Ocean; the Islands of New Amsterdam and St. Paul's, Indian Ocean.

Pterodroma mollis feae (Salvadori)

Oestrelata feae Salvadori, *Ibis*, April 1900, p. 302. Cape Verde Islands: id. *Ann. Mus. Civ. Genova*, ser. ii, vol. xx, p. 305, 1899 (1901)? San Nicolas Island, Cape Verde Group (sheet 20, dated Dec. 11th, 1899; date on back wrapper, 1901).

Distr.: North Atlantic Ocean.

Breeding: Cape Verde Islands.

Pterodroma mollis madeira Mathews.

Pterodroma mollis madeira Mathews, *Bull. Brit. Orn. Club*, vol. liv, p. 161, May 31st, 1934. Madeira.

Distr.: Seas of Madeira, Island and North.

Breeding: Madeira Island (not the Canaries).

Pterodroma mollis deserta Mathews.

Pterodroma mollis deserta Mathews, *Bull. Brit. Orn. Club*, vol. liv, p. 179, June 30th, 1934. Deserta Island. (Fig. Dresser, ix, pl. 721.)

Distr.: Seas around Deserta Island and South.

Breeding: Deserta Island.

Pterodroma heraldica heraldica (Salvin) (25-414). New Caledonian Petrel.

Aestrelata heraldica Salvin, *Ibis*, July 1888, p. 357. Chesterfield Island, north-west of New Caledonia. (Fig. Godman, pl. 67.)

Distr. The Pacific Ocean on either side of the Tropic of Capricorn, almost to the Line.

Breeding: Chesterfield Island, Tonga, the Marquesas and the Paumotu Group.

Pterodroma heraldica paschae Lönnberg.

Pterodroma (Aestrelata) heraldica paschae Lönnberg, in Skottsberg, *Nat. Hist. Juan Fernandez and Easter Island*, vol. iii, p. 23, (before July 19th) 1920. Easter Island.

Distr. : Western Pacific, seas around Juan Fernandez to Ducie Island.
Breeding : Easter Island.

Pterodroma neglecta (Schlegel) (25–412). Neglected or Kermadec Petrel.

Procellaria neglecta Schlegel, *Mus. Pays-Bas*, vol. vi, *Procell.* p. 10, July 1863. Kermadec Islands. (Fig. Godman, pl. 64; Mathews, Suppl. pl. xi.)

Oestrelata leucophrys Hutton, *Proc. Zool. Soc. Lond.*, 1893, p. 752, pl. 63, Apr. 1st, 1894. Sunday Island, Kermadec Islands.

Rhantistes raoulensis Salvin, *Cat. Birds Brit. Mus.* vol. xxv, p. 412, 1896 (pref. Nov. 3rd, 1895): as synonym of *neglecta* ex Bonaparte, *Compt. Rend. Acad. Sci. Paris*, vol. xlii, p. 765, April 1856 (ex Gould, MS.).

Pterodroma neglecta quintali Mathews, *Austral Av. Rec.* vol. iii, p. 68, April 7th, 1916. Lord Howe Island.

Distr. : New Zealand Seas, northwards to the Kermadec and Lord Howe Islands. Seas around Juan Fernandez Islands.
Breeding : Kermadec (Sunday and Meyer) and Lord Howe Islands; Masatierra Island (Rapa and Ducie ?) and the Paumotu Group.

Pterodroma arminjoniana (Giglioli and Salvadori) (25–413). South Trinidad Petrel.

Aestrelata arminjoniana Giglioli and Salvadori, *Ibis*, Jan. 1869, p. 62. South Trinidad Island. (Fig. Godman, pls. 65–6.)

Aestrelata trinitatis Giglioli and Salvadori, *Ibis*, Jan. 1869, p. 65. Trinidad Island, South Atlantic.

Procellaria sandaliata Salvin in Rowley's *Miscell.* vol. i, pp. 232 and 238, May 1876, as synonym of *arminjoniana*.

Oestrelata wilsoni Sharpe, *Bull. Brit. Orn. Club*, vol. xii, p. 49, Feb. 28th, 1902. South Trinidad Island.

Aestrelata chionophara Murphy, *Auk*, vol. xxxi, January 1914, p. 13, pl. 2. Trinidad Islet.

Distr. : Seas around South Trinidad. Accidental to the United States (Ithaca, N.Y.).
Breeding : South Trinidad.

Pterodroma phaeopygia phaeopygia (Salvin) (25–407). Dark-rumped Petrel.

Oestrelata phaeopygia Salvin, *Trans. Zool. Soc. Lond.* vol. ix, p. 507, pl. 88, fig. 1, 1876. Chatham Island, Galapagos. (Fig. Godman, pl. 56; *T.Z.S.* ix, pl. 88.)

Distr. : The seas of the Galapagos Archipelago.
Breeding : Indefatigable Island, Galapagos Archipelago.

Pterodroma phaeopygia sandwichensis (Ridgway).

Oestrelata sandwichensis Ridgway, in Baird, Brewer & Ridgway, *Mem. Mus. Comp. Zool. Harvard*, vol. xiii (*Water Birds of North America*, vol. ii), p. 395, 1884. Introd. March 31st. Hawaii Island, Sandwich Island. (Fig. Rothschild, *Laysan*, pl. 30.)

Distr. : Hawaiian Archipelago.
Breeding : Hawaiian Archipelago (Molokai, Kauai).

Pterodroma externa externa (Salvin) (25–411). Juan Fernandez Petrel.

Oestrelata externa Salvin, *Ibis*, July 1875, p. 373. Mas-a-fuera, of the Juan Fernandez Group. (Fig. Godman, pl. 62.)

Distr. : Juan Fernandez Group, to Clipperton Island (10° N., 109° W.).
Breeding : Masafuera in the Juan Fernandez Group.

Pterodroma externa cervicalis (Salvin) (25–411). Sunday Island Petrel.

Oestrelata cervicalis Salvin, *Ibis*, April 1891, p. 191. Kermadec Islands. (Fig. Buller, Suppl. pl. 4 ; Godman, pl. 63 ; *Cat. Birds*, xxv, pl. 6.)

Distr. : Seas of Kermadec.
Breeding : Sunday Island, Kermadec Islands.

Pterodroma externa tristani Mathews.

Pterodroma externa tristani Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 63, Dec. 30th, 1931. Tristan da Cunha.

Distr. : Tristan da Cunha.
Breeding : Tristan da Cunha (?).

Genus **COOKILARIA** Bp.

Cookilaria Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xliii, p. 994, Nov. 1856. Substitute name for "*Rhantistes* Reichenbach." Type (by original designation) : *Procellaria cookii* Gray.
Rhantistes Reichenbach, *Nat. Syst. Vögel*, p. iv. 1852 (1853). Type (by original designation) : *P. cookii* Gray. Not Kaup, *Skizz. Entwick.-Gesch. Nat. Syst.* p. 105, 1829.
Oestrelatella Bianchi, *Faune de la Russie, Oiseaux*, vol. i, pt. ii, p. 521, Jan. 1913. Type (by subsequent designation, ib. p. 719 : *Oestrelata hypoleuca* Salvin.

Cookilaria leucoptera leucoptera (Gould) (25–416). White-winged Petrel.

Procellaria leucoptera Gould, *Ann. Mag. Nat. Hist.* vol. xiii, p. 364, May 1st, 1844. Cabbage Tree Island, Port Stephens, New South Wales. (Fig. Gould, vii, pl. 51 ; Math. pl. 88 ; Godman, pl. 69.)
Rhantistes velox Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 768, May 1856. New name for *leucoptera*. Not *Procellaria velox* Kuhl, 1820, which is *P. turtur*.
Cookilaria cookii byroni Mathews, *Bull. Brit. Orn. Club*, vol. xxxvi. p. 48, Feb. 3rd, 1916. Byron Bay, error = Port Stephens.

Distr. : Seas around New South Wales.
Breeding : Cabbage Tree Island, Port Stephens, New South Wales.

Cookilaria leucoptera brevipes (Peale) (25–408). Short-footed or Collared Petrel.

Procellaria brevipes Peale, *U.S. Expl. Exped.* p. 294, vol. viii, in or before Oct. 1848 : lat. 68° S., long. 95° W. (near Peter Island, off Alexander Island, Antarctic Circle). (Fig. Godman, pl. 57.)
Fulmarus aneiteimensis Salvin, *Cat. Brit. Birds Mus.* vol. xxv, p. 408 (pref. Dec. 16th, 1895), 1896, as synonym of *brevipes* (ex Gray, *Hand-l. Gen. Spec. Birds B.M.* pt. iii, p. 107, Aug. 18th, 1871, nude name).
Procellaria torquata Macgillivray, *Zool.* vol. xviii, Aug. 1860, p. 7133. New Hebrides. (Fig. *Ibis*, 1891, pl. 9.)
Cookilaria melanopterus Mathews, *Ibis*, July 1933, p. 541, as a synonym of *brevipes* (ex Grey, *Hand-l. Gen. Spec. Birds B.M.* vol. iii, p. 106, Aug. 18th, 1871, nude name).

Distr. The Antarctic Circle, through the Pacific almost to the Line.
Breeding : Aneiteum Island, New Hebrides ; Vita Levu, Fiji.

Cookilaria leucoptera longirostris (Stejneger) (25–418).

Aestrelata longirostris Stejneger, *Proc. U.S. Nat. Mus.* vol. xvi, 1893, p. 618, Oct. 30th, 1893. Province of Mutzu, Hondo, Japan.

Distr. : Seas of Japan and Bonin Islands.

Breeding : Nohondo-shima, Parry Group, Bonin Islands.

Cookilaria leucoptera hypoleuca (Salvin) (25–409). White-breasted Petrel.

Oestrelata hypoleuca Salvin, *Ibis*, July 1888, p. 359. Krusenstern Rock, near Laysan. (Fig. Godman, pl. 58, and Rothschild, *Birds of Laysan*, pl. 30.) See *Thyellodroma cuneata*, p. 186.

Distr. : Seas around the Hawaiian Group.

Breeding : Hawaiian Group (Laysan, Pearle, Hermes, Lisianski, Krusenstern Reef, Midway and Ocean Islands and French Frigate Shoals).

Cookilaria leucoptera masafuerae (Lönnberg).

Pterodroma cookii masafuerae Lönnberg, in Skottsberg's *Nat. Hist. Juan Fernandez and Easter Islands*, vol. iii, pt. i, p. 14 (before July 19th) 1920. Masafuera Island.

Distr. : Seas around Juan Fernandez.

Breeding : Masafuera, Juan Fernandez Group.

Cookilaria cookii cookii (Gray) (25–417). Blue-footed Petrel.

Procellaria cookii Gray, in Dieffenbach's *Travels in New Zealand*, vol. ii, p. 199, mid-Jan. 1843. New Zealand. (Fig. Math. pl. 87 ; Godman, pl. 71 ; Ereb. & Terr. pl. 35.)

Proc(ellaria) velox Gray, *Gen. Birds*, vol. iii, p. 645, June 1844, as synonym of *Cookilaria cookii* (Gray). Ex Solander MS. Not Kuhl, 1820, which is *P. turtur*.

Distr. : Seas of the north of North Island, New Zealand.

Breeding : Little Barrier Islands and on the Chickens.

Cookilaria cookii pycrofti (Falla).

Pterodroma pycrofti Falla, *Rec. Auckland Inst. Mus.* vol. i, no. 4, p. 176, Sept. 25th, 1933. Taranga (Hen and Chickens Island), New Zealand (off the N.W. of North Island).

Distr. : Taranga Island.

Breeding : Taranga Island, or Hen and Chickens Island.

Cookilaria cookii axillaris (Salvin) (25–418). Chatham Island Petrel.

Oestrelata axillaris Salvin, *Bull. Brit. Orn. Club*, vol. i, p. xxxiii, March 1st, 1893. Chatham Islands. (Fig. *Cat. Birds*, xxv, pl. 7 ; Godman, pl. 72.)

Distr. : Not common on the seas around its breeding locality.

Breeding : Chatham Islands.

Cookilaria cookii nigripennis (Rothschild) (25–409).

Oestrelata nigripennis Rothschild, *Bull. Brit. Orn. Club*, vol. i, p. lvii, July 4th, 1893. Kermadec Islands. (Fig. Godman, pl. 59.)

Oestrelatella nigricollis Bianchi, *Faune de la Russie, Oiseaux*, vol. i, pt. ii, p. 727, Jan. 1913 : error for *nigripennis* Rothschild. Cf. Bianchi, ib. p. 947.

Distr. : Seas of the Kermadec Islands.

Breeding : Kermadec Islands (Sunday, Meyer, Macauley and Curtis).

Cookilaria cookii orientalis (Murphy).

Pterodroma cookii orientalis Murphy, *Amer. Mus. Novit.* no. 370, p. 5, Sept. 6th, 1929, 200 miles west of Callao, Peru.

Distr.: West coast of South America between lat. 12° and 34° South.
Breeding: Not known.

Cookilaria cookii defilippiana (Giglioli and Savaldori) (25–417).

Aestrelata defilippiana Giglioli and Salvadori, *Ibis*, Jan. 1869, p. 63. Off northern Chile.

Distr.: Seas around the breeding places.
Breeding: Masatierra and Santa Clara Islands of the Juan Fernandez Group.

Subfamily **PACHYPTILINAE.** Dove Prions.

Genus **HALOBAENA** Bonaparte.

Halobaena Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 768, May 1856. Type (by monotypy): *Procellaria caerulea* Gmelin.
Zaprium Coues, *Bull. U.S. Nat. Mus.* no. 2, p. 34, Nov. 1875. Type (by monotypy): *P. caerulea* Gmelin.

Halobaena caerulea (Gmelin) (25–431). Blue Petrel.

Procellaria caerulea Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 560, April 20th, 1789. Southern Ocean, 47° to 58° S. (Fig. Gould, vii, pl. 52; Godman, pl. 81; Math. vol. ii, pl. 91.)
Procellaria forsteri Smith, *Illustr. Zool. South Africa*, pt. xi, pl. 43, July 1840. Cape Seas. Not Latham, *Index Ornith.* vol. ii, p. 827, 1790, which is *Pachyptila vittata*.
Procellaria similis Forster, *Descr. Anim. ed Licht.* p. 59 (pref. Jan. 1st), 1844. Antarctic Ocean.
Halobaena typica Salvin, *Cat. Birds Brit. Mus.* vol. xxv, p. 431, 1896 (pref. Dec. 16th, 1895), as synonym of *caerulea* Gm. ex Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 768, May 1856, nude name.
Halobaena caerulea victoriae Mathews, *Austral Av. Rec.* vol. iii, p. 54, April 7th, 1916. Victoria.
Halobaena caerulea murphyi Brooks, *Bull. Mus. Comp. Zool. Harvard*, vol. lxi, p. 146, June 1917. South Georgia.

Distr.: Southern Ocean reaching as far north as Victoria in Australia, about 42° S. lat.: even recorded from Fiji. Generally between the 40° and 60° parallel in the Southern Ocean.
Breeding: Kerguelen Island in the Indian Ocean: Falkland Islands and South Georgia in the Atlantic Ocean (Bouvet Island ?). Not on Macquarie Island, off New Zealand.

Genus **PACHYPTILA** Illiger.

Pachyptila Illiger, *Prodr. Mamm. et Av.* p. 274 (pref. April 1811. Type (by subsequent designation Selby, *Cat. Gen. Subgen.* Types, *Aves*, p. 49, 1840): *P. forsteri* Latham = *Procellaria vittata* Gmelin.
[? *Prion* Lacepède, *Tabl. Oiseaux*, p. 15, 1799 (Dec.). Indeterminable, cf. Mathews and Iredale, *Ibis*, April 1913, p. 236; and Iredale, *Austral Av. Rec.* vol. ii, pt. i, p. 25, Aug. 2nd, 1913.
Priamphus Rafinesque, *Analyse Nat.* p. 72, 1815: new name for "*Prion* Lac."]
Prion Lesson, *Manual d'Orn.* vol. ii, p. 399, June 1828. Type (by monotypy): *P. vittata* Gmelin.

Pachyptila vittata vittata (Forster) (25–432). Broad-billed Prion.

Procellaria vittata Forster, *Voyage Round the World*, vol. i, p. 98, 1777 (pref. March 1st). New Zealand. Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 560, April 20th, 1789. New Zealand, for same bird as Forster's. (Fig. Gould, *Austr.* vii, pl. 55 ; Godman, pl. 82 ; Math. vol. ii, p. 213.)

Procellaria forsteri Latham, *Index Ornith.* vol. ii, p. 827, before Dec. 9th, 1790. New Zealand.

Procellaria latirostris Bonnaterre, *Tabl. Encycl. Méth. Ornith.* vol. i, p. 81, 1791. New Zealand.

(*Prion*) *lamellirostris* Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 768, April 28th, 1856, as synonym of *Prion forsteri*.

Prion magnirostris Gould, *Proc. Zool. Soc. Lond.* 1862, p. 125, Aug. 1st. New Zealand.

Prion latirostris Gray, *Hand-l. Gen. Sp. Birds B.M.* vol. iii, p. 108, Aug. 18th, 1871 (pref. July 8th), as synonym of *vittata*.

Distr. : The seas round New Zealand from the north to the south and around Campbell and Auckland Islands. Has been washed up on the New South Wales coast.

Breeding : Dusky Sound : islands off Stewart Island and in Foveaux Strait ; Chatham and Auckland Islands.

Pachyptila vittata gouldi (Mathews) (25–434).

Prion vittatus gouldi Mathews, *Birds Austr.* vol. ii, pt. ii, p. 211, July 31st, 1912. Bass Strait, Victoria. (Fig. Math. vol. ii, p. 213.)

Prion vittatus missus Mathews, *Birds Austr.* vol. ii, pt. ii, p. 212, July 31st, 1912. Perth, South-west Australia. (Fig. Math. pl. 92.)

Distr. : The seas round Australia from Sydney to Perth or even north, especially on the west.

Breeding : On the islands off the south of Australia.

Pachyptila vittata macgillivrayi (Mathews)

Prion vittatus macgillivrayi Mathews, *Birds Austr.* vol. ii, pt. ii, p. 211, July 31st, 1912. St. Paul's Island, Indian Ocean.

Distr. : Seas around the breeding locality.

Breeding : New Amsterdam and St. Paul's Islands, Indian Ocean.

Pachyptila vittata salvini (Mathews)

Prion vittatus salvini Mathews, *Birds Austr.* vol. ii, pt. ii, p. 212, July 31st, 1912. " Crozets, Marion Island, etc." = Marion Island.

Heteroprion desolatus crozeti Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 147, June 28th, 1932. Crozets.

Distr. : Cape Seas and Southern Indian Ocean ranging north to Mozambique and the Seychelles.

Breeding : Marion and Crozet Islands, Indian Ocean.

Pachyptila vittata keyteli (Mathews)

Prion vittatus keyteli Mathews, *Birds Austr.* vol. ii, pt. ii, p. 210, July 31st, 1912. Tristan da Cunha.

Distr. : Seas of Tristan and Gough Islands.

Breeding : Tristan da Cunha and Gough Islands, Atlantic.

Genus **ATTAPRION** Mathews.

Attaprion Mathews, *Bull. Brit. Orn. Club*, vol. liv, p. 25, Oct. 31st, 1833. Type (by original designation) : *Procellaria desolata* Gm.

Attaprion desolatus desolatus (Gmelin) (25 434). Dove Prion.

Procellaria desolata Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 562, April 20th, 1789. Kerguelen Islands. (Fig. Godman, pl. 84.)

Procellaria fasciata Bonnaterre, *Tabl. Encyclop. Méth. Ornith.* vol. i, p. 79, 1791, for same bird as Gmelin's *desolata*.

Prion rossi Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 193, Oct. 1st, 1857. Antarctic Ocean = Kerguelen Island. (ex *Prion rossi* Gray, *List. Spec. Birds Brit. Mus.* pt. iii, *Gallinae, etc.* p. 165, 1844, nude name.)

Prion dispar Vanhoffen, *Journ. f. Ornith.* 1905, p. 505, July. (nude name.)

Distr. : The Indian Ocean from south of Africa to West Australia.
Breeding : Kerguelen Island, Indian Ocean.

Attaprion desolatus mattingleyi (Mathews)

Heteroprion desolatus mattingleyi Mathews, *Birds Austr.* vol. ii, pt. ii, p. 226, July 31st, 1912. Geelong, Victoria. (Fig. Math. vol. ii, p. 231.)

Heteroprion desolatus alexanderi Mathews and Iredale, *Manual Birds Austr.* p. 42, March 9th, 1921. Cottesloe, South-west Australia.

Distr. : The seas of Southern and South-western Australia, apparently only south.
Breeding : Islands off the south and west of Australia.

Attaprion desolatus macquariensis (Mathews).

Heteroprion desolatus macquariensis Mathews, *Birds Austr.* vol. ii, pt. ii, p. 231, July 31st, 1912. Macquarie Islands.

Heteroprion desolatus alter Mathews, *Birds Austr.* vol. ii, pt. ii, p. 231, July 31st, 1912. Auckland Islands. (Fig. Math. vol. ii, p. 231.)

Distr. : Seas of Auckland and Macquarie Islands, New Zealand.
Breeding : Macquarie and Auckland Islands, New Zealand.

Attaprion desolatus banksi (Smith).

Pachyptila banksi Smith, *Illustr. Zool. South Africa, Aves*, pt. xi, pl. 55, July 1840. Cape Seas.

Heteroprion desolatus peringueyi Mathews, *Birds Austr.* vol. ii, pt. ii, p. 230, July 31st, 1912. Pondoland coast, South Africa.

Distr. : South Atlantic from long. 0° to 20° E. and lat. 55° S.
Breeding : Bouvet Island (?).

Attaprion desolatus georgia (Mathews).

Heteroprion desolatus georgia Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 147, June 28th, 1932. South Georgia.

Pachyptila vittata georgicus Mathews, *Bull. Brit. Orn. Club*, vol. liii, p. 214, May 27th, 1933. Same bird as above.

Distr. : Atlantic Ocean from South Georgia through South Orkneys and South Shetlands to the pack-Ice, and northwards to the 40° S.
Breeding : South Georgia, Atlantic Ocean.

Genus **HETEROPRION** Mathews.

Heteroprion Mathews, *Birds Austr.* vol. ii, pt. ii, p. 222, July 31st, 1912. Type (by original designation): *Heteroprion belcheri* Mathews.

Heteroprion belcheri Mathews. Thin-billed Prion.

Heteroprion belcheri Mathews, *Birds Austr.* vol. ii, pt. ii, p. 224, figs. in text, p. 215, July 31st, 1912. Geelong, Victoria.

Distr. : Australia and New Zealand Seas. The east coast of South America from 35° S. to the Horn.

Breeding : (Islands off Australia or New Zealand ?). The Falkland Islands. Probably breeding on the Subantarctic islands of New Zealand, ranging northward to the waters adjacent to Australia and New Zealand ; and the east coast of South America to Montevideo.

Genus **PSEUDOPRION** Coues.

Pseudoprion Coues, *Proc. Acad. Nat. Sci. Philad.* p. 164 (for May) 1866. Type (by original designation) : *Procellaria turtur* Kuhl.

Fulmariprion Mathews, *Birds Austr.* vol. ii, pt. ii, p. 215, July 31st, 1912. Type (by original designation) : *Pseudoprion turtur crassirostris* Mathews.

Pseudoprion turtur turtur (Kuhl) (25–436). Fairy Prion.

Procellaria turtur Kuhl, *Beitr. Zool. vergl. Anat.* zweite abt. p. 143, (pref. April 9th) 1820. Bass Strait. (Fig. Gould, *Austr.* vii, pl. 54 ; Math. pl. 93 ; Godman, pl. 85.)

Procellaria velox Kuhl, *Beitr. Zool. vergl. Anat.* zweite abt. p. 143, (pref. April 9th) 1820, as synonym of *turtur*.

Prion brevirostris Gould, *Proc. Zool. Soc. London*, 1855, p. 88, pl. 93, June 26th. Madeira error = Bass Strait.

Halobaena typica Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 194, Oct. 1857. Waigou Island, error = Bass Strait.

Prion ariel Schlegel, *Mus. Pays-Bas*, vol. vi, *Procell.* p. 18, July 1863. Bass Strait (ex Gould, *Ann. & Mag. Nat. Hist.* vol. xiii, p. 366, May 1st, 1844, nude name.)

Pseudoprion turtur nova Mathews, *Austral Av. Rec.* vol. iii, p. 55, April 7th, 1916. Sydney.

Distr. : The seas of New South Wales, Victoria and South Australia.

Breeding : Kent Group (North-east Island), Albatross Rock, Craggy Island, all in Bass Strait.

Pseudoprion turtur huttoni Mathews. The Chatham Fairy Prion.

Pseudoprion turtur huttoni Mathews, *Birds Austr.* vol. ii, pt. ii, p. 220, July 31st, 1912. Chatham Islands. (Fig. Math. vol. ii, p. 215.)

Distr. : Chatham Islands.

Breeding : Seas round Chatham Islands.

Pseudoprion [**turtur**] **crassirostris** Mathews. Fulmar-billed Prion.

Pseudoprion turtur crassirostris Mathews, *Birds Austr.* vol. ii, pt. ii, p. 221, July 31st, 1912. Bounty Island. (Fig. Math. vol. ii, p. 215.)

Distr. : Seas round Antipodes and Bounty Islands.

Breeding : The Antipodes and Bounty Islands.

Pseudoprion turtur fallai (Oliver). Smooth-billed Fairy Prion.

Pachyptila turtur fallai Oliver, *New Zealand Birds*, p. 114, August 1930. Otago, South Islands, New Zealand.

Pseudoprion turtur steadi Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 146, June 28th, 1932. An island off Stewart Island, New Zealand.

Distr. : Seas round Stewart Island, and south of South Island.

Breeding : The islands off Stewart Island (Cundy, Woman, Soloman and Betry Islands).

Pseudoprion turtur oliveri Mathews. Flake-billed Fairy Prion.

Pseudoprion turtur oliveri Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 147, June 28th, 1932. Motunau Island.

Distr.: From Banks Peninsula on the east of South Island, north to Cook Strait and to the extreme north of North Island, New Zealand.

Breeding: Motunau Island, Kapiti, Stephen and the Brothers Islands; Little Barrier, Poor Knights and Chickens Islands.

Pseudoprion turtur eatoni Mathews. Kerguelen Fairy Prion.

Pseudoprion turtur eatoni Mathews, *Birds Austr.* vol. ii, pt. ii, p. 220, July 31st, 1912. Kerguelen Island.

Distr.: Indian Ocean.

Breeding: Kerguelen Island, Indian Ocean.

Pseudoprion turtur solanderi Mathews. South American Fairy Prion.

Pseudoprion turtur solanderi Mathews, *Birds Austr.* vol. ii, pt. ii, July 31st, 1912, p. 220. West coast of South America.

Distr.: Eastern Pacific.

Breeding: Islands off Chile ?

Subfamily **PROCELLARIINAE**. Shearwaters.

Genus **PROCELLARIA** Linné.

Procellaria Linné, *Syst. Nat.* 10th ed. p. 131, Jan. 1st, 1758. Type (by subsequent designation, Gray, p. 78, 1840): *Procellaria aequinoctialis* Linné.

Priofinus Hombron et Jacquinot, *Comptes Rendus Acad. Sci. Paris*, vol. xviii, p. 355, March 1844 Type (by subsequent designation, Mathews & Iredale, *Austral Av. Rec.* vol. iv, p. 111, Dec. 16th, 1920): *Procellaria aequinoctialis* Linné.

Majaqueus Reichenbach, *Nat. Syst. Vögel*, p. iv, 1852 (1853). Type (by original designation): *P. aequinoctialis* Linné.

Cymatobolus Heine und Reichenow, *Mus. Hein.* p. 363, (pref. Sept.) 1890: new name for "*Majaqueus* Reich."

Procellaria aequinoctialis aequinoctialis Linné (25–395). White-chinned Petrel or Cape Hen.

Procellaria aequinoctialis Linné, *Syst. Nat.* 10th ed. p. 132, Jan. 1st, 1758. Cape Seas. (Fig. Godman, pl. 44.)

Procellaria nigra Forster, *Descr. Anim. ed. Licht.* p. 26, 1844 (pref. Jan.), substitute name for *aequinoctialis* L. (Not *Procellaria nigra* Pallas, *Spicil. Zool.* fasc. v, p. 28, 1769, which is indeterminable.)

Procellaria aequinoctialis mixta Mathews, *Birds Austr.* vol. ii, pt. i, May 30th, 1912, p. 111. Eastern Cape Seas. Type from the South Atlantic 300 miles north of Capetown.

Procellaria aequinoctialis brabournei Mathews, *Birds Austr.* vol. ii, pt. i, May 30th, 1912, p. 113. West coast of South America.

Distr.: From 60° S. lat. to the Tropic of Capricorn and even to the equator. From the Cape westward to South America and down the east coast to the South Shetlands: westward across the Indian Ocean as far as 100° E. lat.: casually to south-east Brazil, Angola and Mozambique.

Breeding: Falkland Islands; South Georgia; Crozets and Kerguelen.

Procellaria aequinoctialis steadi Mathews.

Procellaria aequinoctialis steadi Mathews, *Birds Austr.* vol. ii, pt. i, p. 112, May 30th, 1912. Antipodes Island. (Fig. Math. vol. ii, p. 112.)

Procellaria fuliginosa, White's *Journal*, pl. on p. 252, 1790. "Port Jackson" (not Gmelin, p. 562, which is indeterminable).

"Great Black Petrel" Latham, *Gen. Synop. Birds Suppl.* ii, 1802 (before April), p. 333." Port Jackson."

Distr.: South-eastern Australian and New Zealand Seas. Has been recorded off Peru.

Breeding: Antipodes and Auckland Islands, New Zealand.

Procellaria aequinoctialis conspicillata Gould. Spectacled Petrel.

Procellaria conspicillata Gould, *Ann. & Mag. Nat. Hist.* vol. xiii, p. 363, May 1st, 1844. Australian Seas, error = Cape Seas. (Fig. Gould, vii, pl. 46; Math. pl. 79.)

Procellaria larvata Lesson, *Echo du Monde Sav.* June 1st, 1845, col. 971. Cape Seas.

Procellaria perspicillata Mathews, *Check-list Birds Austr.* pt. ii, p. iv, July 26th, 1923: as synonym of *conspicillata* (ex Eyre, *Journ. Exp. Austr.* vol. i, p. 447, 1845, nude name).

Distr.: Only known from the seas south of South Africa, but recorded for "Australian Seas."

Breeding: Not known (off South Africa ?).

Procellaria [aequinoctialis] parkinsoni Gray (25–397). Black Petrel.

Procellaria parkinsoni Gray, *Ibis*, July 1862, p. 245. New Zealand. (Fig. Buller, 1st ed. pl. 29; Godman, pl. 45; Math. pl. 80; *Cat. Birds*, xxv, pl. 5.)

Distr.: Eastern Australian and New Zealand Seas and east to the Galapagos Archipelago.

Breeding: Little Barrier Island, Te Moehau, the Waitakerei and Rimutaka mountains and probably on several other ranges in the Auckland, Wellington and Nelson Provinces of New Zealand.

Genus **ADAMASTOR** Bp.

Adamastor Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xliii, p. 595, Sept. 1856. Type (by original designation): *Procellaria haesitata* Forster = *Procellaria cinerea* Gmelin. Replaces *Priofinus* auct. = *Procellaria* L.

Adamastor cinerea (Gmelin) (25–390). Pediunker or Grey Shearwater.

Procellaria cinerea Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 563, April 20th, 1789. Antarctic Circle = seas south of New Zealand. (Not Gunnerus 1761, which is *Fulmarus glacialis* L.) (Fig. Gould, vii, pl. 47; Math. pl. 81; Godman, pl. 14.)

Procellaria gelida Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 564, April 20th, 1789. "Inter 35° and 50° South."

"Cinereous Fulmar" Latham, *Gen. Synop. Birds*, vol. iii, pt. ii, 1785, p. 405.

Not "Cinereous Petrel," id. Suppl. ii, 1802, p. 335, which is *Thyellodroma pacifica*.

Procellaria melanura Bonnaterre, *Tabl. Encycl. Méth. Ornith.* vol. i, p. 79, 1791.
Procellaria haesitata Forster, *Desc. Anim ed Licht.* p. 208, Jan. 1st, 1844. Not Kuhl, *Beitr. Vergl. Zool. Anat.* p. 142, 1820.
Adamastor typus Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 187, Oct. 1st, 1857.
Procellaria adamastor Schlegel, *Mus. Pays-Bas*, vol. vi, *Procell.* p. 23, July 1863: new name only for *typus* Bonaparte.
} Same as Gmelin's species

Procellaria pallipes Mathews, *Birds Austr.* vol. ii, pt. ii, p. 123, July 31st, 1912. New Zealand.

Priofinus cinereus dydimus Mathews, *Austral Av. Rec.* vol. iii, p. 54, April 7th, 1916. New Zealand.

Distr.: The Antarctic Ocean.

Breeding: Macquarie Island, New Zealand (?), Gough Island, (Tristan da Cunha ?), Round Island near Mauritius (?), Kerguelen.

Genus **ARDENNA** Reichenbach.

Ardenna Reichenbach, *Nat. Syst. Vögel*, p. iv, 1852 (1853). Type, by original designation, *Puffinus major* "Faber" of Reich. *Puffinus gravis* O'Reilly.

Ardenna gravis (O'Reilly) (25–373). Great Shearwater.

Procellaria gravis O'Reilly, *Voyage, Greenland, Adj. Seas*, p. 140, p. 12, f. 1, 1818 (May). Cape Farewell and Staten Hook to Newfoundland. (Fig. Godman, pl. 25.)

Puffinus major Temminck, *Man. d'Orn.* 2nd ed. vol. iv, p. 507, 1840. Newfoundland: not *Puffinus major* Faber, *Prodr. Isl. Orn.* p. 56, 1822 (pref. 28th Feb.), which is *Puffinus puffinus* Temm.

Distr.: Flies the Atlantic from at least 60° N. lat. or even the Arctic Circle to 50° S. or even 60°. Cf. Auk, 1934, p. 507.

Breeding: The Tristan da Cunha Group (Nightingale and Inaccessible Islands).

Ardenna kuhli kuhli[1] (Scopoli) (25–375). Mediterranean Great Shearwater.

Procellaria kuhli Boie, *Isis*, 1835, col. 257, Heft iii (for March) Corsica. (Fig. Godman, pl. 26.)

Nectris macrorhynchus Salvin, *Cat. Birds Brit. Mus.* vol. xxv, p. 375, 1896 (pref. Dec. 16th, 1895), as synonym of *kuhli* ex Heuglin, *Syst. Übers Vög. N.-O. Africa*, p. 68, 1856, nude name.

Distr.: The Mediterranean Sea, one record for England. South Atlantic from Brazil to the Cape Seas and on to Kerguelen Island, Indian Ocean. Visits America, according to Murphy, and mixes with *borealis*.

Breeding: In the Mediterranean Sea, Malta, Sardina, the Balearic, Corsica and the Cyclads off Greece. Berlengas, off Portugal.

Ardenna kuhli borealis (Cory).

Puffinus borealis Cory, *Bull. Nutt. Orn. Club.* vol. vi, no. 2, p. 84, April 1881. Off Chatham Island, Mass. United States of America.

Puffinus kuhli fortunatus Bannerman, *Bull. Brit. Orn. Club*, vol. xxxv, p. 120, May 26th, 1915. Isla Graciosa, Canary Islands.

Distr.: North Atlantic from east of America to Africa and even North Brazil. Accidental to New Zealand (cf. Oliver, Emu vol. xxxiv, pt. i, pp. 23–4, July 2nd, 1934).

Breeding: Azores, Madeira, Salvage Island and the Canaries.

Ardenna kuhli edwardsii (Oustalet).

Puffinus edwardsii Oustalet, *Ann. Sci. Nat. Zool. Ser. VI*, vol. xvi, art. 5, p. 1, 1883 (1884 ?). (Sheet mark Oct. 1883). Branco, Cape Verde Islands.

Puffinus mariae Boyd Alexander, *Ibis*, Jan. 1898, p. 92. Brava, Cape Verde Islands.

Distr.: Seas around Cape Verde Islands, one record for England.

Breeding: The Cape Verde Islands.

Ardenna kuhli flavirostris (Gould).

Procellaria flavirostris Gould, *Ann. and Mag. Nat. Hist.* vol. xiii, May 1st, 1844, p. 365. Off Cape of Good Hope in lat. 36° 39′ S., long. 10° 3′ E.

Distr.: Cape Seas to Kerguelen Island Seas.

Breeding: Kerguelen Island, Indian Ocean.

[1] † *Procellaria diomedea* Scopoli, *Annus I, Hist. Nat.*, p. 74, 1769. (No locality given; Mediterranean Sea generally accepted, but cf. Hartert, *Vög. pal. Fauna Nachtr.*, 1, 1923, p. 77.) = Corsica.

Ardenna creatopus (Coues) (25–376). Pink-footed Shearwater.

Puffinus creatopus Coues, *Proc. Acad. Nat. Sci. Phila.* 1864, no. 2, March–April = June 30th, p. 131. San Nicolas Island, California. (Fig. Godman, pl. 27.)

Puffinus? melanoleucus R. A. Philippi, *Anales, Mus. Nac. Chile; Zool.* vol. xv, sec. i, 1902, p. 93, pl. 41. (Prologo dated June 28th, 1901) Corral, Chile.

Distr.: The west coast of America from at least 35° to 40° south, to the Canadian Seas to the north.

Breeding: On the Juan Fernandez Group (Masatierra and Santa Clara); Mocha Islands off the coast of Chile; lat. 38° S., long. 74° W.

Genus **CALONECTRIS** M. & I.

Calonectris Mathews & Iredale, *Ibis*, July 2nd, 1915, pp. 590–592. Type (by original designation): *Procellaria leucomelas* Temm. and Laug.

Calonectris leucomelas (Temm. and Laug.) (25–370). Streaked or White-fronted Shearwater.

Procellaria leucomelas Temminck and Laugier, *Planches Colorés d'Ois*, vol. v, livr. xcix, pl. 587, 1835. Seas of Japan. (Fig. Godman, pl. 21; and *Fauna Jap.* pl. 85; Mathews, Suppl. pl. 36.)

Nectris leucomeloena Heine, *Nomencl. Mus. Heine*, p. 362, after September 1890, new spelling only.

Distr.: Range extends from coasts of Korea and Japan to the Malay Archipelago and New Guinea; occasionally to Ceylon.

Breeding: Korean Islands of Nishijima, Mikurasima, etc.

[The Pescadors and Bonin Islands ?]

Genus **PUFFINUS** Brisson

Puffinus Brisson, *Ornith.* vol. i, p. 56, vol. vi, p. 130, 1760. Type (by tautonymy): *Puffinus* = *Procellaria puffinus* Brunnich.

Nectris Kuhl, *Beitr. Zool. vergl. Anat.* p. 146, 1820 (pref. April 9th). Type (by subsequent designation, Mathews, *Birds Austr.* vol. ii, p. 46, May 30th, 1912): *Procellaria puffinus* Brunnich.

Thyellas Gloger, in Froriep's *Notizen*, vol. xvi, p. 279, 1827 (May): new name for *Puffinus* Brisson.

Rhipornis Billberg, *Synops, Faunae Scand.* vol. i, tab. A, 1828: new name for *Puffinus* Brisson (cf. *Austral Av. Rec.*, vol. ii, pts. 2 and 3, p. 42, Oct. 23rd, 1913).

Cymotomus Macgillivray, *Man. Brit. Ornith.* vol. ii, p. 13, May 28th, 1842. Type (by monotypy): *Procellaria puffinus* Brunnich.

Puffinus puffinus puffinus (Brunnich) (25–377). The Manx Shearwater.

Procellaria puffinus Brunnich, *Orn. Bor.* 1764, p. 29. Faeroes and Norway = Faeroe Island. (Fig. Godman, pl. 28.)

Procellaria anglorum Temminck, *Man. d'Orn.* 2nd ed. vol. ii, p. 806, 1820 (before Oct. 21st). St. Kilda.

Puffinus arcticus Faber, *Prodromus Island Ornith.* p. 56, 1822 (pref. February 28th). New name for *P. anglorum* Temm.

Puffinus major Faber, *Prodromus Island, Ornith.* p. 56, 1822 (pref. February 28th). New name for *P. puffinus* Temm. = Brunnich.

Procellaria vulgaris Wood, *Ornith. Guide*, p. 215, 1835 (pref. Sept. 24th) = 1836, new name for the Manx Shearwater.

Puffinus scotorum Partington, *British Cyclop.* vol. iii. p. 429, 1837 (pref. June) new name for *P. anglorum* Temm.

Puffinus manksii Coues, *Proc. Acad. Sci. Philad.* 1864, March–April = June 30th, p. 135. New name for *anglorum* Temm.

Puffinus puffinus bermudae Nichols and Mowbray, *Auk*, vol. xxxiii, April 1916, p. 195. Gurnet Head Rock, Bermuda. Cf. Dwight, *Auk*, xliv, 1927, p. 243.

Distr.: Flies the North Atlantic Ocean and has been recorded south of the Line.

Breeding: Islands off Wales and Ireland, to the Hebrides, Orkney, Shetlands

and Faeroe Islands; Scilly Islands; Vestmann's Island, Iceland; Bermuda, 65° W. in the Atlantic Ocean; Azores, Madeira Group, Salvages (the Canaries ?); cf. *Ibis*, 1914, p. 472.

Puffinus puffinus yelkouan (Acerbi) (25–379). Eastern Mediterranean Manx Shearwater.

Procellaria yelkouan Acerbi, *Bibl. Ital.* vol. xlvii, p. 297, 1827 (after April 20th). The Bosphorus, opposite Bujukdere. (Fig. Godman, pl. 29 ? back fig.).

Procellaria propontidis Acerbi, ib. alternative name.

Procellaria bysantina Acerbi, ib. alternative name.

Distr.: The Eastern Mediterranean Sea.

Breeding: On the islands in the Aegean Sea, Eastern Mediterranean.

Puffinus puffinus mauretanicus Lowe. Western Mediterranean Manx Shearwater.

Puffinus puffinus mauretanicus Lowe, *Bull. Brit. Orn. Club*, vol. xli, p. 140, July 5th, 1921. Algiers. (Fig. Godman, pl. 29 front fig.).

Distr.: The Western Mediterranean Sea to England.

Breeding: Pityusae Islands (Formantera) and the Balearic Islands: Conejara, off the south coast of Majorca, cf. **Ibis** 1934, p. 722; and probably Corsica and Sardinia.

Puffinus puffinus opisthomelas Coues (25–380). Black-vented Manx Shearwater.

Puffinus opisthomelas Coues, *Proc. Acad. Nat. Sci. Philad.* no. 2, March–April = June 30th, p. 139, 1864. Cape San Lucas, Lower California. (Fig. Godman, pl. 30.)

Puffinus optatus Hartlaub and Finsch, *Mus. Godeffroy Cat.* v, p. 15, 1874, new name for *opisthomelas* Coues.

Puffinus couesi Mathews, *Birds Austr.* vol. ii, pt. i, p. 67, May 30th, 1912. Santa Cruz, California. Cf. Godman, *Monogr.* pt. ii, p. 109, March 1908, under *Puffinus opisthomelas*, Godman not Coues.

Distr.: From California to the Canadian Border.

Breeding: San Benito, Natividad and Guadelupe Islands.

Puffinus puffinus auricularis Townsend. Auriculated (or Townsend's) Manx Shearwater.

Puffinus auricularis Townsend, *Proc. U.S. Nat. Mus.* vol. xiii, p. 133, Sept. 9th, 1890. Clarion Island, Lower California. (Fig. Godman, pl. 31.)

Distr.: From Cape San Lucas south to Clipperton Island.

Breeding: Clarion, San Benedicto Islands in the Revilla Gigedo Group.

Puffinus puffinus newelli Henshaw. Hawaiian Manx Shearwater.

Puffinus newelli Henshaw, *Auk*, vol. xvii, 1900, July, p. 246. Waihee Valley, Ulani = Maui Island, Hawaiian Islands.

Distr.: The seas of the Hawaiian Archipelago.

Breeding: Hawaiian Group (Lanai and Molakai Islands((extinct ?).

Genus **ALPHAPUFFINUS** Mathews.

Alphapuffinus Mathews, *Austral Av. Rec.* vol. ii, pt. v, p. 110, Sept. 24th, 1914. Type (by original designation): *Puffinus assimilis* Gould.

Alphapuffinus assimilis assimilis [1] (Gould) (25–384) Allied or Little Shearwater.

Puffinus assimilis Gould, *Synops. Birds Austr.* pt. iv, App. p. 7, April 1st, 1838. Norfolk Island. (Fig. Gould, *Austr.* vii, pl. 59, Godman, pl. 35.)

Puffinus affinis Anon. *Penny Cyclop.* vol. xviii, p. 42, 1840, error for *assimilis*.

Nectris nugax Gray, *Gen. Birds*, vol. iii, p. 647, June 1844, as synonym of *Puffinus assimilis* Gould Ex Solander MS.

Puffinus australis Gould, *Birds of Austr.* pt. xxxv, vol. vii, Dec. 1st, 1848, text to pl. 59, ex Eyton, as synonym of *assimilis*.

Puffinus assimilis howensis Mathews, *Austral Av. Rec.* vol. ii, p. 125, Jan. 28th, 1915. Lord Howe Island.

Distr. : Eastern Australian Seas to Lord Howe and Norfolk Islands. New Zealand Seas.

Breeding : Norfolk and Lord Howe Islands : Three Kings ; Mokohinau ; Little Barrier ; the Chickens and Cuvier Islands, off New Zealand.

Alphapuffinus assimilis tunneyi (Mathews).

Puffinus assimilis tunneyi Mathews, *Birds Austr.* vol. ii, pt. i, p. 71, pl. 73, May 30th, 1912. Boxer Island, South-west Australia. (Fig. Math. pl. 73.)

Distr. : Seas of South-west Australia.

Breeding : Boxer Island.

Alphapuffinus assimilis kempi (Mathews).

Puffinus assimilis kempi Mathews, *Birds Austr.* vol. ii, pt. i, p. 69, May 30th, 1912. Chatham Islands.

Distr. : Chatham Island Seas.

Breeding : Chatham Island.

Alphapuffinus assimilis kermadecensis (Murphy).

Puffinus assimilis kermadecensis Murphy, *Amer. Mus. Nov.* no. 276, p. 3, Sept. 8th, 1927. Kermadec Islands.

Distr. : Seas of the Kermadec Islands.

Breeding : Kermadec Islands.

Alphapuffinus assimilis kuhliana [2] (Mathews).

Puffinus bicolor Tschudi, *Journ. f. Ornith.* May 1856, p. 187. Sala-y-Gomez and Waihu (indeterminable).

Puffinus kuhliana Mathews, *Bull. Brit. Orn. Club*, vol. liv, p. 25, Oct. 31st, 1933, new name for *Nectris munda* Mathews, *Birds Austr.* vol. ii, pt. i, p. 59, May 30th, 1912, not Kuhl 1820, indeterminable.

Procellaria cyanopus Godman, *Monogr. Petrels*, pt. ii, p. 137, March 1908. Nude name.

Distr. : South Pacific, south of the Tropic of Capricorn from east of New Zealand towards South America.

Breeding : Rapa Island, Austral Group, Pacific Ocean.

Alphapuffinus assimilis elegans (Giglioli and Salvadori) (25-385).

Puffinus elegans Giglioli and Salvadori, *Ibis*, January 1869, p. 68. South Atlantic Ocean, lat. 43° 54′ S., long. 9° 20′ E. (Fig. Godman, pl. 36.)

Distr. : South Atlantic Ocean.

Breeding : Gough Island and Tristan da Cunha, South Atlantic Ocean.

[1] What is *Procellaria obscura* Gmelin, *Syst. Nat.* vol. i, p. 559, 1789, Christmas Island, Pacific Ocean ?

[2] What is *Proc(ellaria) munda* Kuhl, *Beit. Zool. vergl. Anat.* zweite Abth. p. 148, 1920 (pref. April 9th) ; lat. 48° 27′ ; long. 93° = South Pacific off Chile (indeterminable) ?

Alphapuffinus assimilis baroli (Bonaparte).

Procellaria baroli Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 204, Oct. 1st, 1857. Mediterranean, Desertas, Madeira, Canary Islands. Restricted to Desertas, by Bannermann, *Ibis*, 1914, p. 477.
Puffinus gracilirostris Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 204, Oct. 1st, 1857, as synonym of *P.* [*assimilis*] *baroli* Bonaparte ib.
Puffinus godmani Allen, *Auk*, vol. xxv, July 1908, p. 339, Madeira.
Puffinus obscurus atlanticus Rothschild and Hartert, *Bull. Brit. Orn. Club*, vol. xxvii, p. 43, Jan. 23rd, 1911. Porto Santo near Madeira.

Distr.: North Atlantic Ocean, wandering to England and the African Coast.
Breeding: Azores, Madeira, Canary Islands, North Atlantic Ocean.

Alphapuffinus lherminieri lherminieri (Lesson) (25–382). Brown-backed Little Shearwater.

Pufflnus [*sic*] *lherminieri* Lesson, *Rev. Zool.* vol. ii, p. 102, 1839, for April = May: "Ad ripas Antillarum" = West Indies.
Puffinus floridanus Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 204, Oct. 1st, 1857: as synonym of *obscura* Bp. = *lherminieri* Lesson.
Puffinus auduboni Hartlaub and Finsch, *Proc. Zool. Soc.* (*Lond.*), p. 111, June 1st, 1872. Bahamas and Bermuda.

Distr.: Seas west of 40° W. long., along the Tropic of Cancer and several degrees on each side of it.
Breeding: West Indies and Bermuda, Western Atlantic Ocean.

Alphapuffinus lherminieri boydi (Mathews).

Puffinus lherminieri boydi Mathews, *Birds Austr.* vol. ii, pt. i, p. 70, May 30th, 1912. Cape Verde Islands.

Distr.: Seas around the breeding locality, to the British Isles.
Breeding: Cape Verde Islands, Eastern Atlantic Ocean.

Alphapuffinus lherminieri bailloni (Bonaparte).

Procellaria nugax a. bailloni Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 205, Oct. 1st, 1857. Mauritius.

Distr.: The Mascarene Islands, to the Seychelles.
Breeding: Mauritius, Indian Ocean.

Alphapuffinus lherminieri persicus (Hume) (25–381).

Puffinus persicus Hume, *Stray Feathers*, vol. i, no. 1, for Nov. 1872; p. 5, 1873. At sea between Guadar and Muscat. (Fig. Godman, pl. 33; *Cat. Birds*, pl. iv.)

Distr.: Arabian Sea from Aden to the Persian Gulf.
Breeding: Maldive Islands, Indian Ocean.

Alphapuffinus lherminieri polynesiae (Murphy).

Puffinus lherminieri polynesiae Murphy, *Amer. Mus. Nov.* no. 276, p. 8, Sept. 8th, 1927. Tahiti, Society Islands.

Distr.: Seas of the Society Islands.
Breeding: Society Islands, South-eastern Pacific Ocean.

Alphapuffinus lherminieri gunax (Mathews).

Puffinus lherminieri gunax Mathews, *Bull. Brit. Orn. Club*, vol. l, p. 55, March 5th, 1930. Melapav Island, New Hebrides.

Puffinus lherminieri nugax Mathews, *Birds Austr.* vol. ii, pt. i, p. 72, May 30th, 1912. Off Townsville, North Queensland. Not *Puffinus nugax* Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 205, Oct. 1st, 1857. South Pacific Ocean. Not *Nectris nugax* Gray, 1844, cf. p. 180.

Distr. : Seas contiguous to New Hebrides and Banks Group.
Breeding : Melapav Island (?), Western Pacific Ocean.

Alphapuffinus lherminieri dichrous (Finsch and Hartlaub).

Puffinus dichrous Finsch and Hartlaub, *Faun. Centr. Polyn.* 1867, p. 244. McKean Island, Phoenix group. (Fig. Godman, pl. 34 ?).

Distr. : Seas around the Phoenix Group.
Breeding : Phoenix Group, mid-Pacific Ocean.

Alphapuffinus lherminieri minor (Hartlaub).

Puffinus opisthomelas var. *minor* Hartlaub, *Proc. Zool. Soc.* (*Lond.*), 1867, p. 832, April 1868. Pelew Islands.

Puffinus tenebrosus Pelzeln, *Ibis*, Jan. 1873, p. 47. (Fig. 1 on p. 50.) Locality unknown ; designated locality : Pelew Islands.

Distr. : Seas around the Pelew Islands.
Breeding : Pelew Islands, Western Pacific Ocean.

Alphapuffinus lherminieri bannermani (Mathews and Iredale).

Puffinus bannermani Mathews and Iredale, *Ibis*, July 1915, p. 594. North Iwojima, Bonin Islands.

Distr. : Seas around the Bonin Group.
Breeding : Bonin Group, North-west Pacific Ocean.

Alphapuffinus lherminieri subalaris (Ridgway).

Puffinus subalaris Ridgway, *Proc. U.S. Nat. Mus.* vol. xix, 1896, p. 650, March 15th, 1897. Dalrymple Rock, Chatham Island, Galapagos Archipelago.

Puffinus lherminieri becki Mathews, *Birds Austr.* vol. ii, pt. i, May 30th, 1912, p. 70. Culpepper Island, Galapagos Archipelago.

Distr. : Seas around the breeding locality.
Breeding : Galapagos Archipelago, eastern Pacific Ocean.

Alphapuffinus lherminieri heinrothi (Reichenow). New Britain Little Shearwater.

Puffinus heinrothi Reichenow, *Journ. f. Ornith.* April 1919, p. 225. Blanch Bay, New Britain.

Distr. : Seas around the type locality.
Breeding : At the type locality ? Western Pacific Ocean.

Genus **REINHOLDIA** Mathews.

Reinholdia Mathews, *Austral Av. Rec.* vol. i, p. 107, Dec. 24th, 1912. Type (original designation) : *Puffinus reinholdi* Mathews = *Procellaria gavia* Forster.

Cinathisma Hull, *Emu*, vol. xv, p. 205, Jan. 1916 (ex Bull. no. 5, *Roy. Austr. Ornith. Union*, Dec. 21st, 1915). Type (by original designation) : *C. cyaneoleuca* Hull = *byroni* Mathews.

Reinholdia gavia gavia (Forster) (25–381). Fluttering Shearwater.

Procellaria gavia Forster, *Descr. Anim. ed. Licht.* p. 148, (pref. Jan. 1st), 1844. Queen Charlotte's Sound, Cook Strait, New Zealand. (Fig. Godman, pl. 32 ; Math. pl. 74.)

Puffinus reinholdi reinholdi Mathews, *Birds Austr.* vol. ii, pt. i, p. 74, May 30th, 1912. New Zealand.

Reinholdia reinholdi melanotis Mathews, *Bull. Brit. Orn. Club*, vol. xxxvi, p. 89, July 7th, 1916. Kaipara Beach, North Island, New Zealand.

Reinholdia reinholdi montaguei Mathews, *Austral Av. Rec.* vol. v, p. 2, July 17th, 1922. New Caledonia.

Distr. : The seas of New Zealand ; and to New Caledonia accidentally.

Breeding : On islands off the east coast of the Auckland Province, New Zealand ; Bream Islets, Mokohinau, Little and Great Barrier Islands, Hen and Chickens, Saddle Island, Alderman, Group, Motunau and Whale Island ; Stephen Island, Ruamahur-iti. All off New Zealand.

Reinholdia gavia huttoni (Mathews).

Puffinus reinholdi huttoni Mathews, *Birds Austr.* vol. ii, pt. i, p. 77, May 30th, 1912. Snares Island.

Distr. : Seas off the south of New Zealand.

Breeding : The Snares.

Reinholdia gavia byroni Mathews.

Reinholdi reinholdi byroni Mathews, *Austral Av. Rec.* vol. i, p. 187, March 30th, 1913. Byron Bay New South Wales, error = Five Islands, off Wollongong, New South Wales. (Fig. Math. vol. vii, pl. 367, and *Emu*, vol. xv, pl. 31.)

Cinathisma cyaneoleuca Hull, *Emu*, vol. xv, p. 205, Jan. 1916 : ex Bull. No. 5, *Royal Austr. Ornith. Union*, Dec. 21st, 1915. Off Wollongong, New South Wales. (New gen. and sp.)

Distr. : Seas off New South Wales and Victoria.

Breeding : Islands off New South Wales, near Wollongong (?).

Genus **HEMIPUFFINUS** Iredale.

Hemipuffinus Iredale, *Austral Av. Rec.* vol. ii, p. 20, Aug. 2nd, 1913. Type (by monotypy) : *Puffinus carneipes* Gould.

Hemipuffinus carneipes carneipes (Gould) (25–385). Fleshy-footed Petrel.

Puffinus carneipes Gould, *Ann. & Mag. Nat. Hist.* vol. xiii, p. 365, May 1st, 1844. Near Cape Leeuwin, West Australia. (Fig. Gould, *Austr.* vii, pl. 57 ; Math. pl. 76 ; Godman, pl. 37.)

Distr. : South-west Australian Seas.

Breeding : Islands off Leeuwin ; Breaksea, Rabbit and Mutton Bird Island ; Recherche Archipelago.

Hemipuffinus carneipes hullianus (Mathews).

Puffinus carneipes hullianus Mathews, *Birds Austr.* vol. ii, pt. i, p. 90, May 30th, 1912. Norfolk Island, error = Lord Howe Island.

Puffinus carneipes hakodate Mathews, *Birds Austr.* vol. ii, pt. i, p. 90, May 30th, 1912. Japan. (Fig. Godman, pl. 37.)

Puffinus carneipes carbonarius Mathews, *Birds Austr.* vol. ii, pt. i, May 30th, 1912, pp. 90–91. Off Three Kings, North Island, New Zealand. Not of Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 768, April 28th, 1856 : as synonym of *aterrima*. Not of Gray, cf. p. 186.

Puffinus carneipes neozealandicus Mathews, *Bull. Brit. Orn. Club*, vol. xlvi, p. 93, March 25th, 1926. Three Kings Island, new name for the following.

Puffinus carneipes zealandicus Mathews, ib. p. 76, Feb. 25th, 1926, not *Puffinus zealandicus* Sandager, *Trans. New Zeal. Inst.* vol. xxii, p. 291, May 1890.

Distr. : Lord Howe Island and New Zealand Seas. In the North Pacific

from Japan, round the periphery to California. Ranges east to Juan Fernandez off the South American coast.

Breeding : Lord Howe Island ; Karewa and Alderman Islands, Three Kings Island ; Hen and Chickens, Mercury (New Zealand).

Genus **NEONECTRIS** Mathews.

Neonectris Mathews, *Austral Av. Rec.* vol. ii, p. 12, Aug. 2nd, 1913. Type (by original designation) : *Puffinus brevicaudus* Gould = *P. tenuirostris* T. & L.

Neonectris tenuirostris (Temm. & Laug.) (25–388). Short-tailed Shearwater.

Procellaria tenuirostris Temminck et Laugier, *Planches Colores d'Ois*, livr. xcix, vol. v, pl. 587, 1835. Japan. (Fig. *Fauna Jap.* pl. 86.)

Puffinus brevicaudus Gould, *Birds Austr.* pt. xxviii, Sept. 1st, 1847. Green Island, Bass Strait. (Fig. Gould, *Austr.* vii, pl. 56 ; Math. pl. 78 ; Godman, pl. 39.)

Puffinus intermedius Hull, *Emu*, vol. xi, p. 98, Oct. 2nd, 1911. Cabbage Tree Island, Port Stephens, New South Wales.

Neonectris tenuirostris grantianus Hull, *Emu*, vol. xv, p. 206, Jan. 1st, 1916 (ex Bull. No. 5, *Roy. Austr. Ornith. Union*, Dec. 21st, 1915. Ulladulla, New South Wales.

Neonectris tenuirostris hulli Mathews, *Bull. Brit. Orn. Club*, vol. xxxvi, p. 82, May 25th, 1916. Barrier Reef, Queensland.

Distr. : The Pacific Ocean from Tasmania north around the coast practically, and down the west coast of America to California.

Breeding : South Australia, Big Althorpe Island : Victoria, Griffith Islands, Phillip's Island in the Hunter and Furneaux Groups ; Tasmania, Ninth Island in the north and Great Actoen Island in the south.

Genus **PARANECTRIS** Iredale.

Paranectris Iredale, *Austr. Zool.* vol. vi, pt. ii, p. 115, Jan. 14th, 1930. Type (by original designation) : *Procellaria grisea* Gm.

Paranectris griseus griseus (Gmelin) (25–386). Sombre Shearwater.

Procellaria grisea Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 564, April 20th, 1789. New Zealand Seas. (Fig. Godman, pl. 38 ; Math. pl. 77.)

" Grey Petrel " Latham, *Gen. Synops.* vol. iii, pt. ii, p. 399, 1785, 35° to 50° S.

Procellaria lugens Kuhl, *Beit. Zool. vergl. Anat.*, zweite Abth. p. 144, 1820 (pref. April 9th) : as synonym of *Puffinus griseus* Gm.

Procellaria tristis Forster, *Descr. Anim. ed. Licht.* p. 205, 1844 (pref. Jan. 1st). New Zealand.

Neonectris griseus pescadoresi Mathews and Iredale, *Ibis*, July 1915, p. 602. Pescadores Island.

Neonectris griseus missus Mathews and Iredale, *Ibis*, July 1915, p. 603. Kurile Islands.

Neonectris griseus nutcheri Mathews, *Austral Av. Rec.* vol. iii, p. 54, April 7th, 1916. Sydney.

Distr. : Occurs in the East Australian and New Zealand Seas, migrating northwards to the Kurile Islands, where it meets the breeding birds from Chile which fly up the west coast of America.

Breeding : On headlands on the mainland of New Zealand, in a few localities and on many islands off the coast, Mokohinau, Moturoa, White Island, Whale Island, Alderman Islands, Kapiti, Chatham's Island, Stewart Island and especially in the off-lying islets ; and the Snares, Auckland Campbell and Macquarie Islands, Broughton Island, New South Wales.

Paranectris griseus chilensis (Bp.). Chilian Sombre Shearwater.

Nectris chilensis Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 202, Oct. 1st, 1857. Chile. Breeding Chile.

Nectris gama Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 202, Oct. 1st, 1857, named pl. 56 in Smith's *Birds of South Africa*, 1840. Designated locality: Pacific Ocean, off Chile. Breeding Chile.

Nectris amaurosoma Coues, *Proc. Acad. Nat. Sci. Philad.* 1864, p. 124, no. 2, March–April = June 30th. Lower California (Cape St. Lucas). Breeding Chile.

Distr.: West coast of America from Chile to the Kurile Islands.

Breeding: Chile, high up in the Andes, Cobija: and Wollaston Island, Chile, 15 miles north of Cape Horn.

Paranectris griseus stricklandi (Ridgway). Atlantic Sombre Shearwater.

Puffinus stricklandi Ridgway, in Baird, Brewer and Ridgway, *Mem. Mus. Comp. Zool.* vol. xiii (*Water Birds of North America*, vol. ii), p. 390, 1884. North Atlantic Ocean.

Distr.: Seas of South Atlantic, northward to the British Isles. Recorded from Fernando Po and the coast of Angola.

Breeding: Falkland Islands.

Genus **MICROZALIAS** M. & I.

Microzalias Mathews & Iredale, *Ibis*, 1915, p. 597, July 2nd. Type (by original designation): *Puffinus* (*Nectris*) *nativitatis* Streets.

Microzalias nativitatis (Streets) (25–389). Christmas Island Black Shearwater.

Puffinus (*Nectris*) *nativitatis* Streets, *Bull. U.S. Nat. Mus.* no. 7, p. 29, 1877 (pref. April). Christmas Island, Pacific Ocean. (Fig. *Birds of Laysan*, pl. 28; Godman, pl. 40.)

Distr.: The Pacific Islands, from a little north of the Tropic of Cancer to a little south of the Tropic of Capricorn.

Breeding: Marcus Island; Hawaiian Group (French Frigate Shoals, Laysan, Bird and Lisianski Islands); Christmas Island; Phoenix Group; south to Rapa and Ducie.

Genus **THYELLODROMA** Stejneger.

Thyellodroma Stejneger, *Proc. U.S. Nat. Mus.* vol. xi, p. 93, Nov. 8th, 1888. Type (by original designation): *Puffinus sphenurus* Gould = *Puffinus chlororhynchus* Lesson.

Zalias Heine und Reichenow, *Nomencl. Mus. Hein.* p. 362, (pref. Sept.) 1890. Type (by subsequent designation, Mathews, *List Birds Austr.* p. 33, Dec. 1913): *P. chlororhynchus* Lesson.

Thyellodroma pacifica pacifica (Gmelin). Dark Wedge-tailed Shearwater.

Procellaria pacifica Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 560, April 20th, 1789. Pacific Ocean, restricted to Kermadec Islands. (Fig. Mathews, pl. 75.)

Founded on "Pacific Petrel," Latham, *Gen. Synop. Birds*, vol. iii, pt. ii, 1785, p. 416.

Cinereous Petrel, ib. Suppl. ii, 1802, p. 335, not of 1785, p. 405, which is *Adamastor cinerea*.

Puffinus chlororhynchus iredalei Mathews, *Bull. Brit. Orn. Club*, vol. xxvii, p. 40, Dec. 31st, 1910. Kermadec Island.

Puffinus pacificus royanus Mathews, *Birds Austr.* vol. ii, pt. i, p. 85, May 30th, 1912. Sydney, New South Wales.

Puffinus pacificus whitneyi Lowe, *Bull. Brit. Orn. Club*, vol. xlv, p. 106, May 30th, 1925. Fiji Islands.

Distr.: Fiji to eastern Australian and New Zealand Seas, and to the Phoenix and Society Islands.

Breeding : Kermadec Islands ; Lord Howe and Norfolk Islands ; Islands off Queensland, Raine and Capricorn : off New South Wales, South Solitary, North Coffs, Broughton, Big Cabbage Tree, Big Bird, Five, Brush, Tollgate and Montague Islands ; Fiji (Kandavu) ; Phoenix and Society Islands.

Thyellodroma pacifica chlororhyncha (Lesson) (25–372).

Puffinus chlororhynchus Lesson, *Traité d'Orn.* livr. viii, p. 613, June 11th, 1831. No loc. restricted to Slope Island, Shark's Bay, West Australia. (Fig. Gould, *Austr.* vii, pl. 58 ; Godman, pl. 24.)

Puffinus sphenurus Gould, *Ann. & Mag. Nat. Hist.* vol. xiii, p. 365, May 1st, 1844. Houtman's Abrolhos, Western Australia.

Proc(ellaria) carbonaria Gray, *Gen. Birds*, vol. iii, p. 647, June 1844 : as synonym of *P. chlororhynchus* Lesson.

Distr. : Seas of Western Australia.

Breeding : Islands off West Australia, Carnac, Abrolhos, Rat, Rottnest and Slope Islands. The Dampier Archipelago.

Thyellodroma pacifica hamiltoni (Mathews).

Puffinus pacificus hamiltoni Mathews, *Birds Austr.* vol. ii, pt. i, p. 82, May 30th, 1912. Cousine, Island, Seychelles.

Distr. : Seas around the Mascarene Group to Seychelles and east to Christmas Island, Indian Ocean.

Breeding : Seychelles (Aride and Cousine Islands) : Round, Réunion and Mauritius in the Mascarene Group, Indian Ocean.

Thyellodroma pacifica alleni (Mathews).

Puffinus pacificus alleni Mathews, *Birds Austr.* vol. ii, pt. i, p. 83, May 30th, 1912. San Benedicto Island, Revilla Gigedos.

Distr. : Seas of the Revilla Gigedo Group.

Breeding : Revilla Gigedo Group (San Benedicto) off Mexico.

Thyellodroma pacifica cuneata (Salvin) (25–371). Light Wedge-tailed Shearwater.

Puffinus cuneatus Salvin, *Ibis*, July 1888, p. 353. Krusenstern Rock, near Laysan. (Fig. Godman, pl. 22, and *Av. Hawa.* pt. iv.) See *Cookilaria hypoleuca*, p. 170.

Puffinus knudseni Stejneger, *Proc. U.S. Nat. Mus.* vol. xi, p. 93, Nov. 8th, 1888. Hawaii. (Fig. *Av. Hawa.* pt. iv.)

Puffinus pacificus laysani Mathews, *Birds Austr.* vol. ii, pt. i, p. 83, May 30th, 1912. Laysan Islands.

Distr. : From the Bonin Islands, south to the Line and east to 140° W. long. Bonin, Vulcan, Marshall Islands.

Breeding : From the Bonins to the Hawaiian Archipelago (Kauai, Necker, Laysan, Bird, French Frigate Shoals and Lisiansky Islands), Sulphur, Marcus, Caroline, Surprise, McKeans, Willis, Borabora, and Fanning Islands.

Thyellobroma pacifica bulleri (Salvin) (25–371). Ashy-back or New Zealand Shearwater.

Puffinus bulleri Salvin, *Ibis*, July 1888, p. 354. New Zealand. (Fig. Buller, 2nd ed. pl. 41 ; Godman, pl. 23.)

Puffinus zealandicus Sandager, *Trans. New Zeal. Inst.* 1889, vol. xxii, p. 291, May 1890. Mokohinau New Zealand.

Distr. : From the east coast of the Auckland Peninsula, New Zealand, across the Pacific to California.

Breeding : Poor Knights Island [and Mayor Island ?] off New Zealand.

Family **THALASSIDROMIDAE** (Hydrobatidae). Short-legged Storm-Petrels.

Genus **THALASSIDROMA** Vigors.

Thalassidroma Vigors, *Zool. Journ.* vol. ii, no. 7, p. 405, 1825 (for October). Type (by original designation): *Procellaria pelagica* L.

Hydrobates Boie, *Isis*, 1822, col. 562, heft v, for May. Type (by subsequent designation, Baird, Brewer and Ridgway, *Water Birds of North Amer.* vol. ii, p. 403, 1884): *Procellaria pelagica* L. (not *Hydrobata* Vieillot, *Analyse*, p. 42, 1816.)

Zalochelidon Billberg, *Synops. Faun. Scand.* vol. i, pt. ii, 1828. Type (by monotypy): *Procellaria pelagica* L. Cf. *Austral Av. Rec.* vol. ii, pp. 42 and 48, Oct. 23rd, 1913.

Thalassidroma pelagica pelagica (Linné) (25–342). Storm Petrel.

Procellaria pelagica Linné, *Syst. Nat.* ed. 10, vol. i, Jan. 1st, 1758, p. 131, in albo (= alto) Oceano. Restricted type locality; coast of Sweden. (Fig. Godman, pl. 1.)

Hydrobates faeroeensis Brehm, *Handb. Naturg. Vögel Deutschl.* p. 803, 1831 (a substitute name for *pelagica* L.)

Thalassidroma minor Brehm, *Vögelfang.* p. 353, 1855 (pref. Nov. 8th, 1854). North Sea.

Thalassidroma albi-fasciata Brehm, *Vögelfang.* p. 354, 1855 (pref. Nov. 8th, 1854). North Sea.

Thal(assidroma) tenuirostris Brehm, *Naumannia*, 1855, as synonym of *T. pelagica* (L.).

Thalassidroma fasciolata Tschudi, *Journ. f. Ornith.* 1856, p. 180, May, a substitute name for *pelagica* L.

Thalassidroma dubia Mathews, *Ibis*, July 1933, p. 541, as synonym of *pelagica* L. (ex Tschudi, *Journ. f. Ornith.* 1856, p. 190, nude name.)

Distr.: Northern Atlantic Ocean, to the Lofoten Islands; the north-west coast of Canada in the later summer: to the Cape Seas and the west coast of Africa.

Breeding: Vestmans Island off Iceland; Lofoten Islands off Northern Norway; Faeroes; Shetland and Orkneys and off Scotland; islands off Pembrokeshire and Wales and off Northern Ireland. Bass Rock; the Scillys; some Channel Islands and some off Brittany; off South Spain.

Thalassidroma pelagica melitensis Schembri.

Thalassidroma melitensis Schembri, *Cat. Orn. del Gruppo di Malta*, p. 118, pl. 5, 1843. Malta.

Procellaria lugubris Bonaparte, *Atti Scienzati Italiani Milano*, vol. vi, 1844, p. 445, 1845 (Sept. 26th). Mediterranean Sea; designated locality, Malta (ex Natterer).

Distr.: The Mediterranean Sea.

Breeding: Corsica, Lipare (Italy); islands off Malta; the Balearic Islands (Eviza).

Genus **TETHYSIA** Mathews.

Tethysia Mathews, *Bull. Brit. Orn. Club*, vol. liii, p. 154, March 25th, 1933. Type (by original designation): *T. tethys* Bp.

Tethysia tethys tethys (Bonaparte) (25 346). The Galapagos White-rumped Storm Petrel.

Thalassidroma tethys Bonaparte, *Journ. f. Orn.* vol. i, Jan. 1852, p. 47. Galapagos Islands. (Fig. Godman, pl. 2.)

Distr.: Seas between Galapagos Archipelago and the mainland of Northern South America.

Breeding: Galapagos Archipelago (Lower Island).

Tethysia tethys kelsalli (Lowe).

Thalassidroma tethys kelsalli Lowe, *Bull. Brit. Orn. Club*, vol. xlvi, p. 6, Nov. 4th, 1925. Ancon, Peru.

Distr.: Peruvian Coast.

Breeding: San Gallen and Pescadores Islands, off Peru.

Genus **HALOCYPTENA** Coues.

Halocyptena Coues, *Proc. Acad. Nat. Sci. Philad.* 1864, p. 78, no. 2, March–April = June 30th. Type (by original designation) *Halocyptena microsoma* Coues.

Halocyptena microsoma Coues (25–346). Least Storm Petrel.

Halocyptena microsoma Coues, *Proc. Acad. Nat. Sci. Philad.* 1864, p. 79, no. 2, March–April = June 30th. San José del Cabo, Lower California. (Fig. Godman, pl. 3, and Elliot, 2, p. 61.)

Distr. : The coast of West America from California to the Line (Equador).

Breeding : San Benito Island, Lower California ; Isla Partida : San Esteban. San Luis Islands, Consag Rock ; (Islands in the Gulf of California).

Genus **OCEANODROMA** Reichenbach.

Oceanodroma Reichenbach, *Nat. Syst. Vögel*, p. iv, 1852 (1853). Type (by original designation) *Procellaria furcata* Gmelin.

Oceanodroma furcata (Gmelin) (25–357). Fork-tail Petrel.

Procellaria furcata Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 561, April 20th, 1789. Icy seas between America and Asia = Bering Sea. (Fig. Godman, pl. xi.)

Procellaria orientalis Pallas, *Zoogr. Rosso-Asiat.* vol. ii, p. 315, 1811. Kurile Islands and Unalaska.

Procellaria fuscata (sic) Pallas, ib. for the description in Pennant's *Zool. Arct.* vol. ii, p. 535, no. 463, 1785.

Th(alassidroma) cinerea Gray, *Gen. Birds*, vol. iii, p. 648, June 1844: as synonym of *P. furcata* Gm. (ex Gould).

Thalassidroma plumbea Peale, *U.S. Explor. Exped. Birds*, vol. viii, p. 292, Oct. 1848: as synonym of *furcata* Gm.

Procellaria cana Bianchi, *Faune de la Russie Ois.* vol. i, pt. ii, p. 564, Jan. 1913: as synonym of *furcata* ; ex *Procellaria cana* Pallas, Georgi, *Geogr.–phys. Beschr. Russ. Reicks.* vol. iii, Abt. vii, p. 1754, no description, 1801. Im Ostmeer um die Inseln = Kurile Islands.

Distr. : Northern Pacific Ocean on the American coast from North lat. 33° to Bering Sea ; to Kotzebue Sound in Alaska and opposite in Siberia, then south to Kobe in Japan.

Breeding : Aleutian Islands to Copper Island and perhaps the Kurile Islands ; Chica Rocks, Sitka Sound, Agattu (South and Forrester, and St. Lazaria Islands) ; Oregon (Bird rocks off Netarts Bay) ; California (Sugarloaf Rock, Trinidad, Humboldt Co., and Whaler Island, near Crescent City, Del Norte).

Genus **BANNERMANIA** M. & I.

Bannermania Mathews and Iredale, *Ibis*, July 1915, p. 578. Type (by monotypy) *Thalassidroma hornbyi* Gray.

Bannermania hornbyi (Gray) (25–356). Banded Fork-tail (or Chilian Fork-tail) Petrel.

Thalassidroma hornbyi Gray, *Proc. Zool. Soc. Lond.* 1853, p. 62 = July 25th, 1854. North-west coast of South America. (Fig. Godman, pl. 10.)

Procellaria (Oceanites) collaris Philippi, *Verhandl-Deutschen wissensch. Vereins Santiago*, vol. iii, pt. i, p. 11 and plate, 1895. Tableland east of Taltal, Chile. Cf. *id. Anales Mus. Nac. Chile Zool.* no. 15, p. 90, pl. 42, fig. 3, 1902. Taltal, Chile.

Distr. : Occurse only along the western coast of South America from 32° South to the Line.

Breeding : Taltal, Chile, lat 25° 25′ 20″ south and long. 70° 34′ 10″ west.

Genus **CYMOCHOREA** Coues.

Cymochorea Coues, *Proc. Acad. Nat. Sci. Philad.* 1864, p. 75, no. 2, March–April = June 30th. Type (by original designation) *Procellaria leucorhoa* Vieillot.

Pacificodroma Bianchi, *Faune de la Russie Ois.* vol. i, pt. ii, pp. 516, 559, Jan. 1913. Type (by original designation) *Thalassidroma monorhis* Swinhoe.

Loomelania Mathews, *Bull. Brit. Orn. Club*, vol. liv, p. 119, March 29th, 1934. Type (by original designation) *Procellaria melania* Bp.

Cymochorea leucorhoa leucorhoa (Vieillot) (25 345). Leaches Fork-tail Petrel.

Procellaria leucorhoa Vieillot, *Nouv. Dict. Hist. Nat.* vol. xxv, 1817 = Dec. 26th, 1818, p. 422. Maritime parts of Picardy. (Fig. Godman, pl. 4.)

Procellaria leachii Temminck, *Man. d'Orn.* 2nd ed. p. 812, 1820 (before Oct. 21st). St. Kilda.

Procellaria atlantica Bonaparte, *Journ. Acad. Nat. Sci. Philad.* vol. iii, p. 230, 1823 = Jan. 1824. Newfoundland.

Procellaria bullockii Fleming, *Hist. Brit. Anim.* p. 136, 1828 (before April 1st). St. Kilda.

Distr. : Atlantic from Greenland to the Mediterranean Sea.

Breeding : Atlantic Ocean (North-east), Vestman's Islets, Iceland ; The Flannans, St. Kilda Group and north Rona, Scotland ; off Mayo and Kerry in Ireland ; on the western side off Maine, between Muscongers Bay and Machias Bay and north to Greenland.

Cymochorea leucorhoa beali (Emerson).

Oceanodroma beali Emerson, *Condor*, vol. viii, March 20th, 1906, p. 54. Sitka Bay, Alaska.

Oceanodroma beldingi Emerson, *Condor*, vol. viii, March 20th, 1906, p. 54. Netarts Bay, coast of Oregon.

Distr. : Pacific from Bering Sea to South of the Line.

Breeding : Pacific (N.W.), Sitka Sound (South and Forrester Island), Oregon, rocks off Netarts Bay : Olympiads, near Cape Flattery, Washington State ; Bering Sea, rocky islets off Attu, Kyska, Amtchitka in the Aleutian Islands to Copper Island, near Commander Islands, and the Kurile Islands.

Cymochorea leucorhoa kaedingi (Anthony).

Oceanodroma kaedingi Anthony, *Auk*, vol. xv, Jan. 1898, p. 37. At sea near Guadalupe Island, Lower California.

Distr. : California south to Clarion and Socorro Islands.

Breeding : Guadalupe Island, Lower California.

Cymochorea leucorhoa monorhis (Swinhoe) (25–356). Uniform Fork-tailed Petrel.

Thalassidroma monorhis Swinhoe, *Ibis*, Oct. 1867, p. 386. Near Amoy, China. (Fig. Godman, pl. 9 ; *Cat. Birds*, pl. 2.)

Distr. : China and Japan to Java and Sumatra.

Breeding : The small islands off N.W. Formosa.

Cymochorea leucorhoa socorroensis (Townsend) (25 352).

Oceanodroma socorroensis Townsend, *Proc. U.S. Nat. Mus.* vol. xiii, p. 134, Sept. 9th, 1890. Socorro Island, Revilla Gigedo Archipelago, Lower California.

Oceanodroma monorhis chapmani Berlepsch, *Auk*, vol. xxiii, April 1906, p. 185. San Benito Island.

Distr. : California south to the Galapagos.

Breeding : On the islands off Lower California and west coast of Mexico. (Castle Island, off Point St. George Island and Whaler Island, Sugarloaf Rock,

near Trinidad (Calif.), both near Crescent City, Del Norte (Calif.), South Farallons, Los Coronados, and San Benito (Calif.).

Cymochorea [monorhis] homochroa Coues (25–255). Ashy Fork-tail Petrel.

Cymochorea homochroa Coues, *Proc. Acad. Nat. Sci. Philad.* 1864, p. 77, no. 2, March–April = June 30th. Farallon Islands, California. (Fig. Godman, pl. 8.)

Distr. : Confined to the western coast of America between 38° and 33° North. San Francisco to Los Coronados Islands.

Breeding : South-east Farallon Island ; on some of the Santa Barbara Island, San Miguel Island, and Santa Cruz ; and Los Coronados Islands, Mexico.

Cymochorea macrodactyla (Bryant) (25 351). Guadalupe Fork-tail Petrel.

Oceanodroma leucorhoa macrodactyla Bryant, *Bull. Calif. Acad. Sci.* vol. ii, no. 8, p. 450, July 25th, 1887. Guadalupe Island, Lower California. (Fig. Godman, pl. 5A.)

Distr. : Seas around the breeding locality.

Breeding : Guadalupe Island only, California (Extinct ?).

Cymochorea melania melania (Bonaparte) (25-353). Black Fork-tail Petrel.

Procellaria melania Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xxxviii, 1854 (April 3rd), p. 662. Coast of California. (Fig. Godman, pl. 6.)

Procellaria scapulata Bonaparte, *Consp. Gen. Avium*, vol. ii, p. 196, Oct. 1st, 1857, as synonym of *melania* Bp.

Oceanodroma townsendi Ridgway, *Proc. U.S. Nat. Mus.* vol. xvi, 1893, p. 687, Nov. 24th, 1893. Off the coast of Western Mexico, north of Cape St. Lucas and Guaymas.

Distr. : The Pacific Ocean along the American coast from 40° North to 7°–10° South.

Breeding : Los Coronados, San Benito, Consag Rock, San Luis Archipelago, San Esteban Island and Isla Partida, Gulf of California.

Cymochorea melania matsudairae (Kuroda).

Oceanodroma melania matsudariae (sic.) Kuroda, *Ibis*, 1922, p. 311, April. Sagami Bay, Japan.

Distr. : The seas of Japan.

Breeding : Japanese islands off Sangmi Sea.

Cymochorea markhami Salvin (25–354). Grey-headed Fork-tail Petrel.

Cymochorea markhami Salvin, *Proc. Zool. Soc. Lond.* Oct. 1st, 1883, p. 430. Coast of Peru. Lat. 19° 40′ S., long. 75° W. (Fig. Godman, pl. 7.)

Distr. : West Coast of South America from Callao, Peru, to Chile.

Breeding : Not known.

Cymochorea [markhami] owstoni M. & I. (25-352). Japanese Grey-headed Fork-tail Petrel.

Cymochorea owstoni Mathews & Iredale, *Ibis*, July 1915, p. 581. Akinose, Sagami Sea, Japan.

Distr. : Japan and some islands south, to the Hawaiian Archipelago.

Breeding : Japan and Hawaiian Archipelago.

Cymochorea castro castro (Harcourt) (25–350). Madeiran Fork-tail Petrel.

Thalassidroma castro Harcourt, *Sketch of Madeira*, p. 123, 1851. Deserta Island, near Madeira. (Fig. Godman, pl. 5.)

Thalassidroma jabe-jabe Barbosa du Bocage, *Jorn. Sci. Math. Phys. e Nature, Lisboa*, vol. v, no. 18, p. 120, for June 1875 (before Jan. 1876). Raza Island, Cape Verde Island.

Distr.: South Atlantic Ocean and Madeira, Canaries, etc., to the Gulf of Guinea. Accidental to Pennsylvania and District of Columbia, United States of America.

Breeding: Cape Verde Islands, Salvages, Madeira, Azores and St. Helena.

Cymochorea castro cryptoleucura Ridgway (25–350).

Cymochorea cryptoleucura Ridgway, *Proc. U.S. Nat. Mus.* vol. iv, p. 337, March 29th, 1882. Kauai, Sandwich Islands. (Fig. Dresser, ix, pl. 718.)

Thalassidroma cryptoleuca Ogilvie Grant, *Bull. Brit. Orn. Club*, vol. iv, p. xxxv, May 31st, 1895, new spelling only.

Distr.: Sandwich Islands.

Breeding: Sandwich Islands (Kauai, Mühau and French Frigate Shoals).

Cymochorea castro bangsi (Nichols).

Oceanodroma castro bangsi Nichols, *Auk*, vol. xxxi, July 1914, p. 389. Lat. 1° W., long. 93° W.

Distr.: Seas of Galapagos Islands.

Breeding: Pacific Ocean Galapagos Archipelago (Cowley Island) (Cocos Island ?).

Sub-family **OCEANITINAE**. Long-legged Storm Petrels.

Genus **OCEANITES** Keys. & Blasius.

Oceanites Keyserling & Blasius, *Wirbelth. Europa's*, p. xciii, 1840 (before April). Type (by monotypy): *Thalassidroma wilsoni* Bonaparte = *Procellaria oceanica* Kuhl.

Oceanites oceanicus oceanicus (Kuhl) (25–358). Yellow-webbed Storm Petrel.

Procellaria oceanica Kuhl, *Beitr. Zool. vergl. Anat.* Zweite Abt. p. 136, 1820 (pref. April 9th). South Atlantic Ocean. (Fig. Gould, *Austr.* vii, pl. 65; Godman, pl. 12.)

Procellaria wilsoni Bonaparte, *Journ. Acad. Nat. Sci. Philad.* vol. iii, 1823, p. 231, pl. ix, Jan. 1824. Newfoundland.

Oceanites oceanicus chilensis, W. B. Alexander, *Birds Ocean*, p. 86, 1928, nude name.

Distr.: The Atlantic, the British Islands to Canada (Newfoundland and Resolution Island in Hudson Straits), and south to the breeding-places.

Breeding: South Georgia; South Orkney and South Shetland Islands.

Oceanites oceanicus exasperatus Mathews.

Oceanites oceanicus exasperatus Mathews, *Birds Austr.* vol. ii, pt. i, p. 11, pl. 68, May 30th, 1912. New Zealand Seas. (Fig. Math. pl. 68.)

Distr.: The Indian Ocean to the Arabian Sea; Pacific Ocean, Australia and New Zealand Seas to the west coast of North America, California (Monterey to San Francisco).

Breeding: Cape Adare and Robertson Bay, South Victoria Land; Kaiser William Land; Queen Mary Land; Adelie Lands, and King George V Land.

Oceanites gracilis gracilis (Elliot) 25 361. Graceful Storm Petrel.

Thalassidroma gracilis Elliot, *Ibis*, 1859, p. 391, Oct. West coast of (South) America. (Fig. Godman, pl. 13.)

Procellaria americana, " American Petrel " Latham, *Gen. Hist. Birds*, vol. x, p. 189, 1824.

Distr. : Coast of Chile to the Line.

Breeding : Not known.

Oceanites gracilis galapagoensis Lowe.

Oceanites gracilis galapagoensis Lowe, *Bull. Brit. Orn. Club*, vol. xli, p. 140, July 5th, 1921. Charles Island, Galapagos Archipelago.

Distr. : Seas of the Galapagos Archipelago.

Breeding : Galapagos Archipelago.

Genus **PELAGODROMA** Reichenb.

Pelagodroma Reichenbach, *Nat. Syst. Vögel*, p. iv, 1852 (1853). Type (by original designation): *Procellaria marina* Latham.

Pelagodroma marina marina (Latham) (25–362). White-faced Storm Petrel.

Procellaria marina Latham, *Index Ornith.* vol. ii, p. 826 (before Dec. 9th), 1790. South Atlantic Ocean. (Fig. Godman, pl. 15.)

Proc(ellaria) aequorea Gray, *Gen. Birds*, vol. iii, p. 648, June 1844 : as synonym of *Pelagordoma marina* (Latham). Both names were founded on the same description. Ex Solander MS.

Not *P. aquerea* Kuhl, *Beit. Zool. Vergl. Anat.* Zweite Abt. p. 138, 1820 (pref. April 9th), which may be *grallaria* ?

Distr. : The South Atlantic, below the Tropic of Capricorn.

Breeding : Tristan da Cunha Group (Nightingale Island).

Pelagodroma marina hypoleuca (Moquin–Tandon).

Thalassidroma hypoleuca Monquin-Tandon, in Webb, Berthelot and Moquin-Tandon, *Orn. Canarienne*, vol. ii, p. 45, 1841. Teneriffe, Canary Islands. (Fig. Dresser, ix, pl. 719.)

Distr. : North-east Atlantic, North of the Line ; to the British Islands and four hundred miles off the coast of New Jersey (lat. 40° 34′ N., long. 66° 09′ W.).

Breeding : Cape Verde and Salvages Islands.

Pelagodroma marina dulciae Mathews.

Pelagodroma marina dulciae Mathews, *Birds Austr.* vol. ii, pt. i, p. 21, May 30th, 1912. Breaksea Island, off Albany, South-west Australia. (Fig. Gould, vii, pl. 61 ; Math. pl. 70.)

Pelagodroma marina howei Mathews, *Birds Austr.* vol. ii, pt. i, p. 26, May 30th, 1912. Mud Island, Victoria (breeding).

Distr. : The Southern Australian Seas.

Breeding : S.W. Australia ; small Islands off Cape Leeuwin ; Abrolhos Islands (East Wallaby ; Rat Island). In Victoria in Bass Strait ; Furneaux Group (Isabella Rock), Petrel Island ; Mud Island in Port Phillip Bay ; Three Hummock, Penguin and Stack Islands in the Hunter Group ; Islands off New South Wales (Tollgate, Tom Thumb, Five and Broughton Islands).

Pelagodroma marina maoriana Mathews.

Pelagodroma marina maoriana Mathews, *Birds Austr.* vol. ii, pt. i, p. 24, May 30th, 1912. Chatham Islands.

Distr. : Chatham Islands and New Zealand seas.

Breeding : Various islands off the coast of New Zealand, Mokohinau, Noises, Alderman ; Motunau ; islands off Steward Islands ; Chatham, and Auckland.

Pelagodroma marina passerina (Mathews).

Procellaria passerina Mathews, *Birds Austr.* vol. ii, pt. i, p. 24, May 30th, 1912. Kermadec Islands (ex Solander MS.).

Distr. : Seas of Kermadec Islands.

Breeding : Kermadec Islands.

Genus **NESOFREGETTA** Mathews.

Nesofregetta Mathews, *Birds Austr.* vol. ii, pt. i, p. 31, May 30th, 1912. Type (by original designation): *Fregetta moestissima* Salvin.

Nesofregetta albigularis albigularis (Finsch) (25–367). White-throated Storm Petrel.

Procellaria albigularis Finsch, *Proc. Zool. Lond.* 1877, p. 722, April 1st, 1878. Kandavu, Fiji Islands. (Fig. Godman, pl. 9.) Cf. Murphy, *Amer. Novit.* no. 124, p. 11, 1924 (foot, fig. p. 12.)

Fregetta amphitrite Mathews, *Syst. Av. Austral.* vol. i, p. 108, June 13th, 1927 (as alternative name for *albigularis* Finsch). Ex Jardine, *Mém. Soc. Imp. Sci. Cherbourg*, vol. vi, 1858, p. 172, 1859. (Marquesas Islands), nude name.

Distr. : Mid Pacific, from a little north of the Line almost if not quite to the Tropic of Capricorn.

Breeding : Christmas Island ; Phoenix Group ; New Hebrides (Kandavu and Aneityum) ; Marquesas Group.

Nesofregetta albigularis moestissima (Salvin) (25–367).

Fregetta moestissima Salvin, *Proc. Zool. Soc. Lond.* p. 130, June 1st, 1879. Samoan Island. (Fig. Godman, pl. 20.)

Distr. : Samoa Seas if not extinct.

Breeding : Samoa if not extinct.

Genus **GARRODIA** Forbes.

Garrodia Forbes, *Collected Sci. Papers Garrod*, p. 521 (footnote), 1881 (pref. June 24th). Type (by original designation): *Thalassidroma nereis* Gould.

Garrodia nereis nereis (Gould) (25–361). Grey-backed Storm Petrel.

Thalassidroma nereis Gould, *Proc. Zool. Soc. Lond.* 1840, p. 178, July 1841. Bass Strait, Australia. (Fig. Gould, *Austr.* vii, pl. 64 ; Math. pl. 69 ; Godman, pl. 14.)

Procellaria saltatrix Mathews, *Birds Austr.* vol. ii, pt. i, p. 16, May 30th, 1912. New Zealand.

Procellaria longipes Mathews, *Birds Austr.* vol. ii, pt. i, p. 17, May 30th, 1912. New Zealand.

Distr. : New Zealand seas and to South-eastern Australia.

Breeding : Auckland and Chatham Island ; Tomahawk Island, Otago Peninsula, New Zealand (and Bounty Islands (?)).

Garrodia nereis chubbi (Mathews).

Oceanites nereis chubbi Mathews, *Birds Austr.* vol. ii, pt. i, p. 18, May 30th, 1912. Falkland Islands.

Distr. : Seas off South America, as far as Gough Island, Atlantic Ocean.

Breeding : Falkland Islands ; South Georgia.

Garrodia nereis couesi (Mathews).

Oceanites nereis couesi Mathews, *Birds Austr.* vol. ii, pt. i, p. 18, May 30th, 1912. Kerguelen.

Distr. : Seas around Kerguelen, Indian Ocean.

Breeding : Kerguelen.

Genus **FREGETTA** Bp.

Fregetta Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xli, p. 1113, Dec. 31st, 1855. Type (by original designation): *Thalassidroma leucogaster* Gould.

Cymodroma Ridgway, *Mem. Mus. Comp. Zool. Harvard* (*Water-Birds, North America*, vol. ii), vol. xiii, pp. 363, 418, 1884 (introd. March 31st). Type (by monotypy): *Thalassidroma leucogaster* Gould.

Fregetta tropica tropica (Gould) (25–364). Black-bellied Storm Petrel.

Thalassidroma tropica Gould, *Ann. & Mag. Nat. Hist.* vol. xiii, p. 366, May 1st, 1844. Atlantic Ocean. (Fig. Mathews, *Nov. Zool.* 1933, pls. 8 and 9.)

Distr.: Atlantic Ocean, North and South of the Line.
Breeding: Ascension Island (?), Atlantic Ocean.

Fregetta tropica melanogaster (Gould).

Thalassidroma melanogaster Gould, *Ann. & Mag. Nat. Hist.* vol. xiii, p. 367, May 1st, 1844. South Indian Ocean (St. Paul and Amsterdam Islands.) Gould, *Birds Austr.* pt. xxvi, vol. vii, pl. 62, March 1st, 1847: fig. Math. pl. 71; Godman, pl. 17; *Emu*, xxii, pls. 26 and 29.

Fregetta tubulata Mathews, *Birds Austr.* vol. ii, pt. i, p. 42, May 30th, 1912. (Ex Gould's MSS.). "Near the coasts of West Australia." (Fig. Math. *Lord Howe*, pls. 5 and 10.)

Distr.: South Indian Ocean to West Australia; and South Atlantic.
Breeding: Kerguelen Island, Indian Ocean; South Orkneys, South Georgia and the Falklands, Atlantic Ocean.

Fregetta tropica australis Mathews.

Fregetta tropica australis Mathews, *Austral Av. Rec.* vol. ii, p. 86, Sept. 24th, 1914. New Zealand.

Distr.: The Pacific Ocean from Australian and New Zealand Seas to Peru.
Breeding: New Zealand (Auckland and Bounty Islands).

Fregetta leucogaster leucogaster (Gould) White-bellied Storm Petrel.

Thalassidroma leucogaster Gould, *Ann. Mag. Nat. Hist.* vol. xiii, p. 367, May 1st, 1844. Lat. 36° S., long. 6° 47′ E. (between Tristan da Cunha and the Cape of Good Hope). (Fig. Gould, pt. xxvi, vol. vii, pl. 63, March 1st, 1847, and Godman, pl. 18, Dec. 1907.)

? *Proc(ellaria) fregetta* Kuhl, *Beit. Zool. Vergl. Anat. Ornithologie*, p. 138, 1820 (pref. April 9th). Off Montevideo, South America. Not *P. fregata* L. 1766, p. 212, indeterminable.

Procellaria aquerea Kuhl. *ib.* as synonym.

Distr.: The Atlantic, Indian and Pacific Oceans below the 35° South.
Breeding: Not known.

Fregetta leucogaster deceptis Mathews.

Fregetta leucogaster deceptis Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 146, June 28th, 1932. Off New Zealand. (Fig. Mathews, *Nov. Zool.* 1933, pls. 7 and 9.)

Distr.: Seas off New Zealand.
Breeding: Not known.

Genus **FREGETTORNIS** Mathews.

Fregettornis Mathews, *Birds Austr.* vol. ii, pt. i, p. 31, May 30th, 1912. Type (by original designation): *Procellaria grallaria* Vieillot.

Fregettornis grallaria grallaria (Vieillot) (25 366). White-fringed Storm Petrel.

Procellaria grallaria Vieillot, *Nouv. Dict. d'Hist. Nat.* vol. xxv, p. 418, Dec. 26th, 1818. Australian Seas, error = South America (restricted to Juan Fernandez). (Fig. Gould, *Austr.* vii, pl. 63; Math. pl. 72; Godman, p. 18; *Emu*, xxii, pls. 26–27.)

[? *P(rocellaria) aquerea* Kuhl, *Beit. Zool. vergl. Anat.* zweite abt. p. 138, 1820 (pref. April 9th), as synonym of *P. fregatta* " Banks " Kuhl, ib. ? equals *grallaria V.*]

Distr.: Eastern Pacific, below the Tropic of Capricorn from the type locality to the north and south.

Breeding: Santa Clara, Goat Island, Masatierra and Masafuera in the Juan Fernandez Groups.

Fregettornis grallaria royana Mathews.

Fregettornis royanus Mathews, *Austral Av. Rec.* vol. ii, no. 5, p. 86, Sept. 24th, 1914. Lord Howe Island. (Fig. Mathews' *Suppl.* pls. 5 to 10.)

Fregettornis innominatus Mathews, *Austral Av. Rec.* vol. ii, no. 7, p. 124, Jan. 28th, 1915. Lord Howe Island. (Pls. 6 and 10.)

Fregettornis insularis Mathews, *Austral Av. Rec.* vol. ii, no. 7, p. 124, Jan. 28th, 1915. Lord Howe Island. (Pls. 5 and 10.)

Fregettornis alisteri Mathews, *Austral Av. Rec.* vol. ii, no. 7, p. 124, Jan. 28th, 1915. Lord Howe Island. (Pls. 7 and 10.)

Cymodroma howensis Mathews, *Birds Norfolk and Lord Howe Islands*, p. 11, Oct. 16th, 1928. Lord Howe Island. (Fig. pls. 8 and 10.) For review, see Mathews, *loc cit.* pp. 7–12.

Distr.: South Pacific Ocean around the breeding locality.

Breeding: Lord Howe Island.

Fregettornis grallaria guttata (Mathews).

Fregetta guttata Mathews, *Nov. Zool.* vol. xxxix, no. 1, pp. 45 and 46, Oct. 23rd, 1933. Huapu Island, Marquesas Group. (Foot fig. *Ibis*, July 1933, pl. 18.)

Distr.: Seas around the Marquesas Group.

Breeding: Marquesas Group, Eastern Pacific Ocean.

Fregettornis grallaria titan (Murphy).

Fregetta grallaria titan Murphy, *Amer. Mus. Nov.* no. 322, p. 4, July 14th, 1928. Rapa Island Austral Group.

Distr.: Seas around Rapa.

Breeding: Rapa Island.

Fregettornis grallaria tristanensis Mathews.

Fregettornis grallaria tristanensis Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 123, April 30th, 1932. Tristan da Cunha, Atlantic Ocean.

Distr.: Seas around the Tristan da Cunha Group.

Breeding: Tristan da Cunha, South Atlantic Ocean.

Fregettornis melanoleuca (Salvadori). Black and White Storm Petrel.

Fregetta melanoleuca Salvadori, *Bull. Brit. Orn. Club*, vol. xxi, p. 79, April 27th, 1908. Tristan da Cunha. (Fig. Mathews, *Nov. Zool.* 1933, pls. 4 and 9.)

Distr.: Seas around Tristan da Cunha.

Breeding: Probably breeding on Tristan da Cunha.

Genus **PEALEA** Ridgway.

Pealea Ridgway, *Auk*, July 1886, p. 334. Type (by original designation): *Thalassidroma lineata* Peale.

Pealea lineata (Peale) (25–364). Lined Storm Petrel.

Thalassidroma lineata Peale, *U.S. Expl. Exped.* p. 293, 1848, in or before Oct. Upolu, Samoa. (Fig. Mathews, *Nov. Zool.* 1933, pls. 6 and 9, and Cassin, pl. 39.)

Distr.: Seas around Samoa.
Breeding: Samoa (if not extinct).

Genus **PEALEORNIS** Mathews.

Pealeornis Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 132, May 28th, 1932. Type (by original designation): *Pealeornis maoriana* Mathews.

Pealeornis maoriana Mathews. Peninsula Storm Petrel.

Pealeornis maoriana Mathews, *Bull. Brit. Orn. Club*, vol. lii, p. 132, May 28th, 1932. Bank's Peninsula. (Fig. Godman, pl. 16, Mathews, *Nov. Zool.* 1933, pls. 5 and 9.)

Distr.: Seas to the South of New Zealand.
Breeding: Banks Peninsula, east coast of South Island, New Zealand.

FAMILY **PELECANOIDEIDAE.** Diving Petrels.

Genus **PELECANOIDES.**

Pelecanoides Lacepède, *Tabl. Ois.* p. 13, 1799. Type (by "implication"): *Procellaria urinatrix* Gmelin.
Haladroma Illiger, *Prodr. Mamm. & Av.* p. 274 (pref. April) 1811. Type (by monotypy): *P. urinatrix* Gmelin.
Onocralus Rafinesque, *Analyse Nature*, p. 72, 1815. New name for "*Pelecanoides* Lac."

Pelecanoides urinatrix urinatrix (Gmelin) (25–437). Diving Petrel.

Procellaria urinatrix Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 560, April 20th, 1789. Queen Charlotte's Sound, South Island, New Zealand. (Fig. Gould, vii, pl. 60; Godman, pl. 86.)
Pr(ocellaria) tridactyla Kuhl. *Beitr. Zool. vergl. Anat.* zweite. abt. p. 145, 1820 (pref. April 9th), as synonym of *urinatrix* Gm. (This name occurs in *A Voyage round the world*, Forster, p. 189, 1777, pref. March 1st, as a nude name.)

Distr.: Seas of Cook Strait, New Zealand.
Breeding: Stephen Island, Cook Strait, New Zealand.

Pelecanoides urinatrix belcheri Mathews.

Pelecanoides urinatrix belcheri Mathews, *Austral Av. Rec.* vol. i, p. 84, Sept. 18th, 1912. Victoria. (Fig. Mathews, ii, pl. 94.)
Pelecanoides urinatrix chathamensis Murphy & Harper, *Bull. Amer. Mus. Nat. Hist.* vol. xxxv, p. 65, April 1st, 1916. Chatham Islands. (Fig. Math. ii, pl. 94.)

Distr.: Seas of Southern Australia and New Zealand.
Breeding: Cliff Island of Wilson's Promontory; North-east Island Bass Strait; Mokohinau, Hen and Chickens, Three Kings, Great Barrier, Karewa and Alderman Islands; and islands off Stewart Island. The Chatham, Auckland and Snares Islands and perhaps Macquarie Island, New Zealand.

Pelecanoides urinatrix berard (Gaimard).

Procellaria Berard Gaimard, *Bull. Gén. et Univ. Ann. et Nouv. Sci.* vol. iii, no. 7, p. 53, after June 9th, 1823. Near the Falkland Islands.

Procellarius falklandicus Quoy and Gaimard, *Voy. Uranie and Physic. Zool.* p. 136, Sept. 18th, 1824. Falkland Island (cf. *Ibis* 1933, p. 541, and *Birds Australia*, vol. ii, p. 239, Sept. 20th, 1912).

(*Haladroma*) *melanoleuca* Bonaparte, *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 769, April 28th, 1856, as synonym of *berard*, ex Cuvier.

(*Pelecanoides*) *tenuirostris* Gray, *Handlist Gen. Sp. Birds B.M.* vol. iii, p. 102, Aug. 18th, 1871, as synonym of *berardi* Q. and G. ex Eyton.

Distr. : Seas around the Falkland Islands and northwards along the east coast of South America to Bahia Blanca.

Breeding : Falkland Islands.

Pelecanoides urinatrix dacunhae Nicoll.

Pelecanoides dacunhae Nicoll, *Bull. Brit. Orn. Club*, vol. xvi, p. 103, July 10th, 1906. Tristan da Cunha.

Distr. : Tristan da Cunha and Gough Islands.

Breeding : Tristan da Cunha.

Pelecanoides urinatrix coppingeri Mathews.

Pelecanoides urinatrix coppingeri Mathews, *Birds Austr.* vol. ii, pt. 3, p. 238, Sept. 20th, 1912. Straits of Magellan. Type from Cockle Cove, Pilot Island, Trinidad Channel, Chile.

Distr. : Seas of Chile.

Breeding : Trinidad Channel (?), Chile.

Pelecanoides urinatrix exsul Salvin (25–438).

Pelecanoides exsul Salvin, *Cat. Birds Brit. Mus.* vol. xxv, p. 438, 1896 (pref. Dec. 16th), 1895. Kerguelen Island. (Fig. Godman, pl. 87.)

Distr. : Indian Ocean, the seas around Kerguelen and to the Crozets [Auckland Islands, New Zealand ?].

Breeding : Kerguelen (Crozet Island ?).

Genus **PUFFINURIA** Lesson.

Puffinuria Lesson, *Man. d'Orn*, vol. ii, p. 392, June 1828. Type (by original designation and monotypy): *P. garnotii* Lesson.

Puffinuria garnotii Lesson 25–438. Puruvian Diving Petrel.

Puffinuria Garnotii Lesson, *Man. d'Orn.* vol. ii, p. 394, June 1828, Coast of Peru, between Isla San Gallan and Lima. (Fig. Godman, pl. 88.)

Puffinuria garnotii lessoni Mathews, *Birds Austr.* vol. ii, pt. iii, p. 239, September 20th, 1912. Coast of Chile.

Distr. : Coastal waters of South America from Lobos de Terra, Peru to Valparaiso, Chile.

Breeding : Northern Peruvian Islands, Pescadores Islands, 8 miles off Ancon ; Chincha Islands and San Gallan Island off Pisco, Peru.

Genus **PORTHMORNIS** M. & H.

Porthmornis (subgen.) Murphy and Harper, *Bull. Amer. Mus. Nat. Hist.* vol. xlix, art. xviii, p. 502, fig. 2 b, p. 503 (in key); p. 513, December 23rd, 1921. Type (by monotypy): *Puffinuria garnotii magellani* Mathews.

Porthmornis magellani (Mathews). Magellan Diving Petrel.

Puffinuria garnotii magellani Mathews, *Birds Austr.* vol. ii, pt. iii, p. 239, September 20th, 1912. Straits of Magellan.

Distr.: Seas of the south of South America. Chilian, Fuegian and Patagonian coastal and inland waterways, from Cape Horn, north on the Pacific side of the continent to Trinidad Channel, and on the Atlantic side to Puerto Deseado, Province of Santa Cruz, Argentina.

Breeding: Islands off Magellan Straits, London and Hermite Islands, Chile.

Genus **PELAGODYPTES** M. & H.

Pelagodyptes Murphy and Harper, *Bull. Amer. Mus. Nat. Hist.* vol. xliv, art. xviii, p. 502, fig. 2, c; p. 503, in Key; p. 519, Dec. 23rd, 1921. Type (by monotypy): *Pelecanoides georgica* M. & H.

Pelagodyptes georgicus (M. & H.). South Georgian Diving Petrel.

Pelecanoides georgica Murphy & Harper, *Bull. Amer. Mus. Nat. Hist.* vol. xxxv, art. vii, p. 66, April 1st, 1916. Cumberland Bay, South Georgia, lat. 54° 16′ S., long. 36° 26′ W.

Distr.: Seas around South Georgia [and Macquarie Islands ?].

Breeding: South Georgia [and Macquarie Islands ?].

INDETERMINABLE.

The following names appear to be indeterminable.

Procellaria fregata Linné, *Syst. Nat.* ed xii, vol. i, p. 212, 1766 (pref. May 24th). Habitat, in Oceano.

Procellaria fuliginosa Gmelin, *Syst. Nat.* vol. i, pt. ii, p. 562, April 20th, 1789. Tahiti.

Procellaria diomedea Scopoli, *Annus Hist. Nat.* I. p. 74, 1769. No locality. This is not *Ardenna kuhli* as some thought.

Procellaria curilica Pallas, *Zoogr. Rosso-Asiat.* vol. ii, p. 314, 1811. Kurile Islands.

Procellari munda Kuhl, *Beit. Zool. Vergl. Anat.* zweite. abt. p. 148, 1820 (pref. April 9th). Lat. 48° 27′, long. 93° = South Pacific, off Chile.

Procellaria parvirostris Peale, *U.S. Explor. Exped.* vol. viii, *Birds*, p. 298, 1848 (in or before October). Honden Island, of the Dangerous Archipelago (in August).

Puffinus bicolor Tschudi, *Journ. f. Ornith.* May 1856, p. 187, Sala-y-Gomez and Waihu.

Fregetta lawrencii Bonaparte *Comptes Rendus Acad. Sci. Paris*, vol. xlii, p. 769, April 28th, 1856. Florida, U.S.A

Procellaria punctata Ellman, *Zoologist* 1861, p. 7463. Cf. Coues 1866, p. 162, as synonym of *Daption*.

Oceanodroma tristrami Salvin, *Cat. Birds Brit. Mus.* vol. xxv, p. 354, (pref. Dec. 16th, 1895) 1896. Sendai Bay, Japan.

Pterodroma sordida (Math.).

Procellaria sordida Mathews, *Birds Austr.* vol. ii, pt. ii, p. 162, July 31st, 1912. S.E. of Pitcairn. Island.

Pterodroma agilis (Math.).

Procellaria agilis Mathews, *Birds Austr.* vol. ii, pt. ii, p. 152, July 31st, 1912. South of Easter Island.

Pterodroma siliga Mathews, *Bull. Brit. Orn. Club*, vol. xlvii, p. 40, Nov. 6th, 1926, new name for *agilis* Mathews, 1912, not Gray 1871.

Distr.: Seas of Easter Island.

Pterodroma velificans (Math.).

Procellaria velificans Mathews, *Birds Austr.* vol. ii, pt. ii, p. 161, July 31st, 1912. South of Easter Island.

Distr.: Well south of Easter Island.

Pterodroma atrata (Math.).

Procellaria atrata Mathews, *Birds Austr.* vol. ii, pt. ii, p. 163, July 31st, 1912. Pitcairn Island, S. lat. 25° 21′, long. E. 129°.

Distr.: Pitcairn Island.

TUBINARES. Tube-nosed Swimmers.

SUPERFAMILIES

Nostrils divided by the culmen . . . . . *Diomedeoidea*
Nostrils not divided by the culmen . . . . . *Procellarioidea*

FAMILIES

a². Bill shorter than head; unguis divided from nasal tubes; nasal tubes less than half the length of the exposed culmen, being not one-third. Nostrils partially visible from above. Tail feathers 12 or 14.

b¹. Bill short and stout, about as deep as wide at base; its greatest depth very nearly half the total length of the exposed culmen; depth from base of gonys to top of unguis about as deep as at the base; unguis short, robust and very convex and separated from the nasal tubes by a narrow space measuring much less than half the length of the tubes *Fulmarus*

c¹. Bill all yellow; axillaries narrow . . . . . *F. rodgersi*

c². Bill variegated; axillaries broad . . . . . *F. glacialis*

KEY TO THE GENERA OF PETRELS AND ALBATROSSES

[illegible]

Nostrils divided by the culmen . . . . . [illegible]

Nostrils not divided by the culmen . . . . . [illegible]

FAMILIES

A¹. Wing very long; nostrils opening in the anterior end of the horizontal groove [illegible] . . . . . *Diomedeidae*

B². Nasal tubes divided by the culmen; no hind toe; size large [illegible] . . . . . *Diomedeidae*

B². Nasal tubes united and resting on the basal [illegible] . . . . . *Procellariidae*

C¹. Bill nostril-tubes [illegible] . . . . . *Procellariinae*

C². Nasal opening single, septum [illegible] . . . . . *Puffinurinae*

A². Wing very short; nostrils opening upwards, as parallel longitudinal slits, at the very base of the culmen. No hind toe, size small. Sternum entire, not [illegible] . . . . . *Pelecanoididae*

DIOMEDEIDAE ALBATROSSES

a. Tail rounded and ramicorn without longitudinal groove

b¹. Latericorn not decidedly widest at the base, and the upper mandible not compressed at the base

c¹. Feathers at the base of the lower mandible extending beyond the base of the nasal tube . . . . . *Diomedea*

d¹. Naricornes oval in shape and pointed [illegible] . . . . . *Diomedea*

d². Naricornes * round in shape and pointed forwards . . . . . *D. cauta*

c². Feathers at the base of the lower mandible not extending beyond the base of the nasal tubes . . . . . *Phoebastria*

d¹. Bill over 130 mm. in length; and equal to or longer than the middle toe and claw

e¹. Bill longer (134 to 160) and [illegible] nostril openings oval and facing upwards and distinctly visible from [illegible] . . . . . *P. irrorata*

e². Bill shorter, and not compressed at base; naricornes rounder; nasal openings also rounded facing forwards and only partially visible from above; culmen [illegible] . . . . . *P. albatrus*

d². Bill less than 130 mm. in length, and much shorter than the tail

e¹. Bill longer and thicker (102–113); not compressed at base . . . . . *P. nigripes*

e². Bill shorter (100 to 109) and narrower, compressed at base and much slimmer than *nigripes* . . . . . *P. immutabilis*

Or

d¹. General colour sooty [illegible] . . . . . *P. nigripes*

d². General colour not sooty black above and below

e¹. Under surface [illegible] white.

f¹. Head and neck [illegible] . . . . . *P. albatrus*

f². Head and neck whitish; lores dark . . . . . *P. immutabilis*

e². Under surface waved or vermiculated like the upper surface; lores not dark . . . . . *P. irrorata*

b². Latericorn decidedly widest at the base, and the upper mandible [illegible] . . . . . *Thalassarche*

c¹. Culmicorn and latericorn separated basally by a thin membrane . . . . . *Thalassarche*

d¹. Bill [illegible] . . . . . *T. melanophris*

d². Culmen and lower ramus of under mandible yellow, remainder blackish . . . . . *T. bulleri*

c². Culmicorn and latericorn separated basally by a thick [illegible] . . . . . *Thalassarche*

d¹. Culmicorn rounded basally

e¹. Latericorn [illegible] . . . . . *Thalassarche*

f¹. Bill blue-grey . . . . . *D. cauta*

f². Bill yellowish . . . . . *D. eremita*

e². Latericorn dark . . . . . *Thalassarche chlororhynchos*

d². Culmicorn pointed basally . . . . . *Neabatrus chlororhynchus*

a². Tail wedge-shaped and ramicorn with longitudinal groove . . . . . *Phoebetria*

b¹. Back of neck light, dividing the dark-coloured head from the dark back; sulcus blue . . . . . *P. palpebrata*

b². Back of neck dark, like the head and back; sulcus yellow . . . . . *P. fusca*

PROCELLARIIDAE

SUBFAMILY

A¹. Gonys ascending . . . . . *Halocyptena*

A². Gonys hooked and mostly below the mandibular ramus

B¹. Inner side of upper mandible without fringe-like processes.

C¹. Nostrils separated by a thick septum . . . . . *Procellariinae*

C². Nostrils separated by a thick septum . . . . . *Procellariinae*

B². Inner side of upper mandible with fringe-like processes . . . . . *Pachyptilinae*

SUBFAMILY FULMARINAE Fulmars.

Gonys ascending, and shorter than the nasal tubes. Tail feathers 12–14 or 16. Nostrils separated by a thin septum which is well concealed within the opening of the nasal tubes.

A¹. Bill flattened or depressed: wider than deep; mandibular rami arched and enclosing an unfeathered distal space, like *Pachyptila*: Bill short and stout; depth from gonys to top of ungues less than the depth at base; culmen not arched nor very convex; tail feathers 14; tarsus sharp in front and behind. Both this and *Pachyptila* have the bare space shaped rather like a [illegible] . . . . . *Daption capense*

A². Bill cylindrical or compressed at the base, where it is not wider than deep; mandibular rami normal and enclose [illegible] space

a. Bill longer than head; ungues springing from nasal tubes with [illegible] tubes longer than half the length of exposed culmen. Nostrils not visible from above. Bill [illegible] deeper than wide at the base. Tail feathers 16. . . . . *Macronectes giganteus*

a. [illegible] . . . . . *Fulmarus glacialoides*

being not one third. Nostrils partially visible from above. Tail feathers 12 or 14

b¹. Bill short and stout, about as deep as wide at base; its greatest depth very nearly half the total length of the exposed culmen; depth from base of gonys to top of ungues about as deep as at the base; ungues short, robust and very convex and separated from the nasal tubes by a narrow space measuring much less than half the length of the tubes . . . . . *Fulmarus*

c¹. Bill [illegible] . . . . . *Fulmarus glacialoides*

c². Bill variegated . . . . . *Fulmarus glacialis*

b². Bill long and slender, deeper than wide; its greatest depth much less than half the length of the exposed culmen; depth from base of gonys to top of ungues less than depth at the base; ungues longer, less stout and convex and separated from the nasal tubes by a space measuring much more than half the length of the tubes

c¹. Bill cylindrical. Ungues separated from the nasal tubes by a space about equal to the length of the tubes; head white. Tail feathers 14 . . . . . *Procellaria aequinoctialis*

c². Bill compressed. Ungues separated from the nasal tubes by a space less than the length of the tubes. Head dark. Tail feathers 12 . . . . . *Thalassoica antarctica*

SUBFAMILY PACHYPTILINAE Dove Prions

Gonys hooked and longer than the nasal tubes. Tail feathers 12. Nostrils divided by a thin [illegible] septum. Inner side of upper mandible with fringe-like processes. Nasal tubes stout, [illegible] posteriorly longest.

a. Tail slightly rounded and with distant white tips. Laterally compressed . . . . . *Halobaena caerulea*

a². Tail more or less wedge shaped; tip dark. Lamellae well developed . . . . . *Pachyptila*

b¹. Mandibular rami very arched and enclosing a distensible unfeathered space; cutting edge of bill decidedly waved. Both this and *Daption* have the [illegible] space [illegible] . . . . . *Pachyptila vittata*

b². Mandibular rami less arched, not enclosing a distensible unfeathered space

c¹. Bill not compressed at base, where it is as deep as wide; depth at base equal to about half the total length of culmen

d¹. Ungues full [illegible] . . . . . *Fulmarinpinus crassirostris*

d². Ungues less than half the total length of culmen and [illegible] . . . . . *Pseudoprion turtur*

Bill compressed at base, where it is deeper than wide; depth at base nearly three times the length of culmen. Unguis separated from the nasal tubes by a space very much greater than the length of the tubes, cutting edge of bill straight . . . . . *Halobaena caerulea*

Or

a¹. Cutting edge of maxilla upturned at commissure

b¹. Mandibular rami very arched and enclosing a distensible unfeathered space . . . . . *Pachyptila vittata*

b². Mandibular rami less arched and enclosing a [illegible] space . . . . . *Pachyptila desolata*

a². Cutting edge of maxilla straight or [illegible]

b¹. Bill not compressed at base, where it is as deep as wide; depth at base twice the length of culmen; ungues half as long as culmen and separated from [illegible] . . . . . *Fulmarinpinus crassirostris*

b². Bill compressed at base, where the depth [illegible] . . . . . *Pseudoprion turtur*

separated from [illegible] . . . . . *Halobaena caerulea*

* The naricornes in *exulans* and its subspecies look as though they [illegible] . . . . . be accurate, as [illegible]

† Width of upper mandible at the base, *albatrus* 38 mm., *irrorata* [illegible] . . . . . at the base *albatrus* 49 mm.; *irrorata* 52 mm.

[illegible] . . . . . The [illegible] . . . . . Mottled bill, *nigripes* [illegible]

Nasal opening single, septum dividing the nostrils not visible: second primary longest: sternum entire.

c¹. Larger: wing 181 mm. . . . . *F. grallaria titan*

c². Smaller: wing 153 mm. . . . . *F. grallaria grallaria*

d². Base of the second, third and fourth outer tail feather white on the inner web only.

e¹. Wing 156–170 mm. (average 166). Generally larger . . . . . *F. grallaria tristanensis*

e². Wing 158–168 mm. (average 162). Generally smaller . . . . . *F. grallaria royana* †

* In *castro* the tail (70 mm.) is less than half the length of the wing (157) and forked for less than 12 mm.; tarsus shorter than the middle toe and claw.

In *grallaria* the tail (85) is less than half the length of the wing (177) and forked for over 20 mm.; tarsus longer than the middle toe and claw.

Gonys hooked, and longer than the nasal tubes; tail feathers 12. Nostrils separated by a thin septum, which is wholly or partially concealed inside the opening of the nasal tubes. Inner side of upper mandible without fringe-like processes.

A¹. Hind claw very large, equal in length to the nasal tubes; plumage white; culmen less than half as long as middle toe and claw; tail even . . . . . *Pagodroma*
a¹. Bill small . . . . . *P. nivea*
a². Bill large . . . . . *P. confusa*

A². Hind claw small; plumage of upper parts not white; culmen more than half as long as middle toe and claw; tail graduated. *Cookilaria*
B¹. Depth of bill at shallowest part less than one-third the length of the lower mandible; birds bi-coloured; wing 201–250 . . . . . *Pterodroma arminjoniana*
g². Forehead, lores and the part below the commissure uniform with the head . . . . . *Pterodroma hasitata*
c². Upper tail coverts white . . . . . .
b². Breast and abdomen dark.
c¹. Tail less than half as long as wing. . . . . *Pterodroma macgillivrayi*
d¹. Wing under 210 mm. . . . . *Pterodroma caribbaea*
d². Wing over 240 mm.
e¹. Upper tail coverts white . . . . . .
e². Upper tail coverts not white.
f¹. Bill wide at gape.
g¹. Inner webs of primaries not white. Bill and tarsus of about equal length.
h¹. Back of neck and back sooty brown.
i¹. Culmen not under 40; and bill only moderately stout; wing more than 270 mm.; tail graduated for about 12 mm. . . . . *Pterodroma macroptera*
i². Culmen under 40; and bill very stout; wing less than 260 mm.; tail graduated for about 20–30 mm. . . . . *Pterodroma aterrima*
h². Back of neck and back slaty-grey . . . . . (dark) *Pterodroma mollis deceptornis*
g². Inner webs of primaries more or less white; bill shorter than tarsus.
h¹. Lower tail coverts dark. Under wing lining dark; middle toe and claw over 50 mm.
i¹. Back and scapulars dark brown; white shafts to primaries; axillaries blackish brown, fringed with white . . . . . (dark) *Pterodroma neglecta*
i². Back and scapulars slaty-grey; dark shafts to the primaries; axillaries dark with white tips *Pterodroma melanopus*
h². Lower tail coverts chiefly white; back grey or slaty-grey; dark shafts to the primaries; under wing lining and inner webs of primaries quite white; axillaries white, some barred with grey; middle toe and claw under 50 mm. . . . . *Pterodroma inexpectata*
Pterodroma brevirostris
f². Bill much compressed; general aspect of plumage slaty-grey; no white on primaries . . . . . *Bulweria*
c². Tail more than half as long as wing; wing 190 to 210 mm. . . . . .

c². Wing 169 to 180, average 176·9 . . . . . *A. l. boydi*

δ². Bill slender.

Breeding in the Southern Hemisphere

Diomedea exulans.
Diomedea epomophora.
Phoebastria irrorata.
Thalassarche melanophris.
Thalassarche bulleri.
Thalassogeron chrysostoma.
Nealbatrus chlororhynchus.
Diomedella cauta.
Phoebetria palpebrata.
Phoebetria fusca.
Macronectes giganteus.
Daption capensis.
Priocella antarctica.
Thalassoica antarctica.
Pagodroma nivea.
Cookilaria cooki.
Cookilaria leucoptera.
Pterodroma macroptera.
Pterodroma lessoni.
Pterodroma incerta.
Pterodroma rostrata.
Pterodroma inexpectata.
Pterodroma macgillivrayi.
Pterodroma melanopus.
Pterodroma brevirostris.
Pterodroma heraldica.
Pterodroma neglecta.
Pterodroma arminjoniana.
Pterodroma magentae.
Pterodroma externa.
Halobaena caerulea.
Pachytila vittata.
Attaprion desolatus.
Heteroprion belcheri.
Pseudoprion turtur.
Procellaria aequinoctialis.
Procellaria parkinsoni.
Adamastor cinerea.
Ardenna gravis.
Ardenna creatopus.
Hemipuffinus carneipes.
Reinholdia gavia.
Paranectris griseus.
Neonectris tenuirostris.
Oceanites oceanicus.
Oceanites gracilis.
Pealeornis maoriana.
Fregetta tropica.
Fregetta leucogaster.
Pealea lineata.
Fregettornis grallaria.
Fregettornis melanoleuca.
Garrodia nereis.
Tethysia tethys.
Bannermania hornbyi.
Pelecanoides urinatrix.
Puffinuria garnoti.
Porthmornis magellani.
Pelagodytes georgia.

Breeding in the Northern Hemisphere

Phoebastria albatrus.
Phoebastria nigripes.
Phoebastria immutabilis.
Fulmarus glacialis.
Bulweria bulwerii.
Pterodroma hasitata.
Pterodroma caribbaea.
Calonectris leucomelas.
Ardenna kuhli.
Puffinus puffinus.
Thalassidroma pelagica.
Hylocyptena microsoma.
Oceanodroma furcata.
Cymochorea leucorhoa.
[*Cymochorea monorhis.*]
Cymochorea homochroa.
Cymochorea macrodactyla.
Cymochorea markhami.
Cymochorea owstoni.
Cymochorea melania.

Breeding in the Northern and Southern Hemispheres

Pterodroma alba.
Pterodroma mollis.
Pterodroma phaeopygia.
Alphapuffinus assimilis.
Alphapuffinus lherminieri.
Microzalias nativitatis.
Thyellodroma pacificus.
Pelagodroma marina.
Nesofregetta albigularis.
Cymochorea castro.

LIST OF NAMES.

ON A HITHERTO UNKNOWN FAUNA OF MONTANE BIRDS IN CENTRAL MADAGASCAR.

By FINN SALOMONSEN.

THE central high-plateau and mountains of Madagascar have been considered as being very poor in endemical birds. All species previously recorded from these regions have been well-known inhabitants of the coastal lowlands. The great Franco-Anglo-American Expedition, which recently has been undertaken, has explored the whole island, collecting about 12,000 birds, but could find only two species of birds peculiar to the central mountains in Madagascar. The first of these were the rare *Dromaeocercus seebohmi* Sharpe of which previously only the type-specimen was known. This bird, which is very different from the well-known forest-bird *Dromaeocercus brunneus* Sharpe, was rather common in the bush-vegetations on elevations more than 5,000 ft. in the mountainous massives Ankaratra and Tsaratanana, but nowhere else. Also the other mountain-bird, the peculiar rail *Lemurolimnas watersi* (Bartlett) was only known from the type (and co-types) secured in Betsileo, i.e. the high-plateau in the south of Madagascar. It has now been rediscovered in the north, at Andapa in the Tsaratanana Mountains at about 6,000 ft. altitude.

As a matter of fact, no new mountain-bird has been described from the collections of the expedition, though many (thirteen) new forms from the lowland were discovered. By careful examination of Madagascar birds I have found several birds peculiar to the central high-plateau, and as I think they are of some interest, their descriptions will follow below.

The following investigation is based on the collection of Madagascar birds in the British Museum (Nat. hist.) and the Museum National d'Histoire Natur. in Paris, which for the greater part consists of specimens collected during 1929–1931 by the Franco-Anglo-American Expedition, under the leadership of J. Delacour. It is a great pleasure to me to thank Dr. Lowe and Dr. Berlioz cordially for their kindness in giving me permission to work with these birds.

Newtonia brunneicauda monticola subsp. nov.

Type in the British Museum, ♂ ad., Manjakatompo, Ankaratra Mountains, coll. The Franco-Anglo-American Expedition (J. Delacour), 12.5.1929, no. 162.

Description : This is the most modified species among the mountain-birds. It is distinctly different in the colouration. On the under-parts it is more richly coloured with buff, being much darker than *N. b. brunneicauda* (Newton), on the upper-parts darker greyish-green, nearly dark sooty. The plumage is softer, the feathers longer than in *brunneicauda*.

Measurements : A larger form. The measurements of the wing are as follows :

N. b. brunneicauda : 72 ♂♂ from Eastern Madagascar (Vondrozo, Manombo, Ivohibe, Maroantsetra, Andapa &c.) measure : 52, 52, 52, 53, 53, 53, 53, 53, 53, 53, 53, 53, 53, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 55, 55, 55, 55, 55, 55,

55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 57, 57, 57, 57, 57, 57, 57, 57, 57, 57, 58, 58, 58, 58, 58 58 mm.

54 ♀♀ from the same localities measure : 52, 52, 53, 53, 53, 53, 53, 53, 53, 53, 54, 54, 54, 54, 54, 54, 54, 54, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 57, 57, 58, 58, 58 mm.

N. b. inornata : 24 ♂♂ from Western Madagascar (Lake Tsimanampetsotsa, Lake Iotry, Tabiky, Tsiandro, Marotony, Tsarakibany, Ambre Mountains, Anaborano, Vohemar) measure : 51, 51, 52, 52, 52, 52, 53, 53, 53, 53, 53, 53, 53, 54, 54, 54, 55, 55, 55, 55, 56, 56, 56, 56 mm.

23 ♀♀ from the same localities measure : 51, 51, 51, 51, 52, 52, 52, 52, 53, 53, 53, 54, 54, 54, 54, 54, 54, 54, 55, 55, 56, 56 mm.

N. b. monticola : 13 ♂♂ from Monjakatompo measure : 58, 58, 59, 59, 59, 59, 60, 60, 60, 60, 60, 61, 61, 62 mm.

6 ♀♀ from the same locality measure : 58, 58, 58, 59, 61, 61 mm. The three races thus measure :

N. b. brunneicauda : ♂♂ 52–58 (55.14), ♀♀ 52–58 (54.89) mm.

N. b. inornata : ♂♂ 51–56 (53.63), ♀♀ 51–56 (53.26) mm.

N. b. monticola : ♂♂ 58–62 (59.62), ♀♀ 58–61 (59.17) mm.

The difference in the measurements are best shown on the following schedule, giving the measurements of all specimens examined. Male and female are of the same size (as shown above) and are not kept apart.

Name of Subsp. :	Wing-length in mm. :											
	51	52	53	54	55	56	57	58	59	60	61	62
inornata	6	8	10	11	6	6	—	—	—	—	—	—
brunneicauda	—	5	18	20	39	22	13	9	—	—	—	—
monticola	—	—	—	—	—	—	—	5	5	5	3	1

The two lowland forms *inornata* and *brunneicauda* are nearly alike regarding the measurements, *inornata* being, however, on an average smaller. The greater part of the specimens of *monticola*, examined, are bigger than 58, only 5 birds are 58 and none are smaller. But of the 173 specimens of the two lowland forms, 164 or 95 per cent. are smaller than 58, only 9 specimens reaching this size.

Distribution : Only found at Manjakatompo in the Ankaratra Mountains, Central Madagascar.

Material : 192 specimens, which are distributed as follows :

126 *N. b. brunneicauda* (33 ♂♂, 22 ♀♀ in London ; 39 ♂♂, 32 ♀♀ in Paris).
47 *N. b. inornata* (13 ♂♂, 14 ♀♀ in London ; 11 ♂♂, 9 ♀♀ in Paris).
19 *N. b. monticola* (7 ♂♂, 3 ♀♀ in London ; 6 ♂♂, 3 ♀♀ in Paris).

Zosterops maderaspatana analoga subsp. nov.

Type in the British Museum, ♂ ad., Manjakatompo, Ankaratra Mountains, coll. The Franco-Anglo-American Expedition (J. Delacour), 3.5.1929, no. 61.

Description : Not differing from *Z. m. maderaspatana* (L.), except in having the throat darker and deeper yellow.

Measurements : A much larger form. The measurements of the wing are as follows :

Z. m. maderaspatana : 81 ♂♂ from the following localities : Maroantsetra, Andapa, Antalaha, Sianaka, Manombo, Vondrozo, Ivohibe, Tamatave, Marotony,

Ambre Mountains, Maromandia, Bezona, Tsarakibany, Tsiandro, Bekopaka, Namaroka, Tulear, Lake Ivtry, Tabiky, Ampotaka, measure: 53, 53, 54, 54, 54, 54, 54, 54, 54, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 57, 57, 57, 57, 57, 57, 57, 57, 57, 57, 57, 57, 57, 57, 57, 58, 58, 58, 58, 58, 58, 58, 58, 58, 58, 58, 58, 58, 58, 59, 59, 59 mm.

69 ♀♀ from the same localities measure: 52, 52, 52, 53, 53, 53, 53, 53, 53, 54, 54, 54, 54, 54, 54, 54, 54, 54, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 55, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 56, 57, 57, 57, 57, 57, 57, 57, 57, 57, 57, 58, 58, 58, 58, 58, 58, 58, 58, 59, 59 mm.

Z. m. analoga: 11 ♂♂ from Manjakatompo measure: 59, 59, 60, 60, 61, 61, 62, 64, 64, 64, 65 mm.; a single ♂ from Tsiroanomandidy measures: 62 mm.

5 ♀♀ from Manjakatompo measure: 61, 62, 62, 62, 63 mm. The two races thus measure:

Z. m. maderaspatana: ♂♂ 53–59 (56.33), ♀♀ 52–59 (55.72) mm.

Z. m. analoga: ♂♂ 59–65 (61.75), ♀♀ 61–63 (62.00) mm.

The differences in the measurements are best shown on the following schedule, giving the measurements of all specimens examined. Male and female are of the same size (as shown above) and are not kept apart.

Name of Subsp.:	Wing-length in mm.:													
	52	53	54	55	56	57	58	59	60	61	62	63	64	65
maderaspatana	3	6	17	28	43	26	22	5	—	—	—	—	—	—
analoga	—	—	—	—	—	—	—	2	2	3	5	1	3	1

The greater part of the specimens of *analoga* examined are bigger than 59 mm., only 2 are 59 and none are smaller. The majority of the lowland-form *maderaspatana*, on the contrary, are smaller than 59 mm. Of 150 specimens examined 145 or 97 per cent. are smaller than 59, only 5 specimens reaching this size, and none being larger. The Mountain White-eye is thus modified analogous to *Newtonia*, therefore the designation *analogus*.

Distribution: Opposite to *Newtonia* we have evidence for the occurrence of the Mountain *Zosterops* on other localities on the high-plateau than Manjakatompo. A single male from Tsiroanomandidy, situated to the north-west of Manjakatompo, has a wing-length of 62 mm. and so belongs to *analoga*. A series of specimens captured at Iampasika, a place situated in the mountains south of Fianarantsoa (about 4,000 ft. elevation) which are not of so great height as the Ankaratra Mountains, are exactly intermediate between *madaraspatana* and *analoga*. 5 ♂♂ measure: 56, 57, 60, 61, 61 mm., average: 59·00 mm.

Centre of distribution is the Ankaratra Mountains, but *Z. m. analoga* is also to be found on the high-plateau farther to the west and south. Specimens from Iampasika are intermediate (*maderaspatana* ≷ *analoga*).

Material: 172 specimens, which are distributed as follows:

150 *Z. m. mader a spatana* (35 ♂♂, 29 ♀♀ in London; 46 ♂♂, 40 ♀♀ in Paris).
17 *Z. m. analoga* (5 ♂♂, 3 ♀♀ in London; 7 ♂♂, 2 ♀♀ in Paris).
5 *Z. m. mad.* ≷ *anal.*, from Iampasika (3 ♂♂ in London; 2 ♂♂ in Paris).

Saxicola torquata ankaratrae subsp. nov.

Type in the British Museum. ♂ ad., Manjakatompo, Ankaratra Mountains, coll. The Franco-Anglo-American Expedition (J. Delacour), 14.5.1929, no. 238.

Description : Not differing from *S. t. sibilla* (L.), the only difference being in the size.

Measurements : A much larger form. The measurements of the wing are as follows :

S. t. sibilla : 45 ♂♂ from the following localities : Maroantsetra, Vondrozo, Ambre Mountains, Manombo, Ampotaka, Ivohibe, Andapa, Tulear, Tamatave, Ankafana, measure : 64, 64, 64, 65, 65, 65, 65, 65, 66, 66, 66, 66, 66, 66, 66, 66, 66, 66, 67, 67, 67, 67, 67, 67, 67, 67, 68, 68, 68, 68, 68, 68, 69, 69, 69, 70, 70, 70, 70, 71, 71, 71, 71, 71 mm.

26 ♀♀ from the same localities : 63, 63, 64, 64, 64, 64, 64, 64, 65, 65, 65, 65, 65, 65, 66, 66, 66, 66, 66, 67, 67, 67, 67, 67, 69 mm.

S. t. ankaratrae : 7 ♂♂ from Manjakatompo and 2 ♂♂ from Manjaka measure : 73, 73, 74, 74, 74, 75, 75, 76, 76 mm.

5 ♀♀ from Manjakatompo measure : 73, 73, 73, 74, 74 mm. The two races thus measure :

S. t. sibilla : ♂♂ 64–71 (67·31), ♀♀ 63–67 (65·35) mm.

S. t. ankaratrae : ♂♂ 73–76 (74·44), ♀♀ 73–74 (73·40) mm.

The differences in the measurements are best shown on the following schedule, giving the measurements of all specimens examined. Male and female are somewhat different in size and are here kept apart.

Name of Subsp. :	Wing-length in mm. :													
	63	64	65	66	67	68	69	70	71	72	73	74	75	76
♂♂, *sibilla*	—	3	5	11	8	6	3	4	5	—	—	—	—	—
♂♂, *ankaratrae*	—	—	—	—	—	—	—	—	—	—	2	3	2	2
♀♀, *sibilla*	2	6	7	5	5	—	1	—	—	—	—	—	—	—
♀♀, *ankaratrae*	—	—	—	—	—	—	—	—	—	—	3	2	—	—

The montane form is bigger than 72 mm. both in male and female ; the lowland form never exceeds 71 mm.

Distribution : Centre of distribution is the Ankaratra Mountains, and the greater part of the material comes from Manjakatompo on the north-eastern slopes of these mountains. Two males, collected by Cowan, May 1881, on Manjaka, a smaller chain north of Tananarive not far from the Ankaratra Mountains, measure 74, 76 mm., and they are therefore typical *ankaratrae*. Some birds from Tsiroanomandidy, on the western portion of the high-plateau, are rather large and may be considered as belonging to *ankaratrae* ; they measure : ♂♂ 68, 72, 74 mm. But also some specimens from the central part of Western Madagascar, which is lowland, are long-winged. Three males from Tsiandro, Bekopaka, Bokarano, measure : 73, 74, 75 mm. In the valley north of Ankaratra, at Tananarive, at about 4,000 feet altitude, the birds are intermediate between *sibilla* in the coastal lowlands and *ankaratrae* in the mountains.

4 ♂♂ measure : 67, 71, 71, 71 mm., 1 ♀ measures : 71 mm.

S. t. ankaratrae so inhabits the mountains of Central Madagascar and the high-plateau ; in the central parts of the west its range, however, seems to

extend nearly or quite to the coast. The area, inhabited by *S. t. sibilla*, surrounds the breeding area of *ankaratrae*, as it is found in the coastal regions of the whole east, the south-west and the north.

Material : 96 specimens, which are distributed as follows :

71 *S. t. sibilla* (28 ♂♂, 12 ♀♀ in London ; 17 ♂♂, 14 ♀♀ in Paris).

14 *S. t. ankaratrae* (5 ♂♂, 3 ♀♀ in London ; 4 ♂♂, 2 ♀♀ in Paris).

11 *S. t. sibil.* ≷ *ankar.* from W. Central Madagascar and Tananarive (6 ♂♂ in London ; 4 ♂♂, 1 ♀ in Paris).

Monticola imerina interioris subsp. nov.

Type in the British Museum, ♂ ad., Manjakatompo, Ankaratra Mountains, coll. The Franco-Anglo-American Expedition (J. Delacour), 14.5.1929, no. 252.

Description : Not differing from *M. i. sharpei* (Gray). Perhaps the mountain birds have a tendency to be slightly paler, especially the females, but the difference certainly is too inconspicuous to be recognized.

I do not see any reason to separate the Madagascar genus *Pseudocossyphus* from *Monticola*. All *Pseudocossyphus*, however, are described as *Cossypha*, but I do not think they have anything to do with this genus, although their field-habits resemble more those of *Cossypha*, than of *Monticola*. I shall not here give my reasons for considering that the " *Pseudocossyphus* " forms belong to *Monticola* and not to *Cossypha*. It is sufficient to say, that there exists a very marked sexual difference in the Madagascar forms as in *Monticola*, whereas the sexes are alike in all *Cossypha*. Sharpe, the first describer of the female of *M. sharpei*, did not imagine that the sexes were different and therefore held the female to be the young bird (*Proc. Zool. Soc.*, London, 1871, p. 317). The maintenance of *Pseudocossyphus* as a special genus is quite unnecessary, which is proved by the fact that Sharpe separated *sharpei* as *Pseudocossyphus* (*Cat. Birds Brit. Mus.*, Vol. vii, 1883, p. 21), but kept *imerina* in *Cossypha* (*ibid.*, p. 35), whereas Sclater (*Syst. Av. Ethiop.*, p. 476) regards them as only subspecies, of the same species. I follow Sclater and unite the peculiar *imerina* from Western Madagascar with *sharpei* as one species, the name of which must stand as *imerina*, as this form was first described (Hartlaub, *Journ. f. Ornith.*, 1860, p. 97). Recently Delacour has studied these birds, and he considers *imerina* and *sharpei* as two different species (*L'Oiseau*, 1932, p. 59).

Measurements : A larger bird. The *Monticola* in Eastern Madagascar gradually increase in size from the coastal regions to the mountains. The birds from the eastern forests on the coast or at any rate on a very low level are the smallest and nearly alike in size on the different localities, though on an average smallest at Sianaka and Fanovana. From these two last localities the specimens examined measure : ♂♂ 75, 75, 75, 75, 76, 77, 78, 78 ; ♀♀ 71, 72, 73, 74, 75, 77 mm. From Maroantsetra, Ivohibe, and Iamposika they are almost of the same size. They measure : ♂♂ 77, 78, 79 ; ♀ 75 mm. With these specimens agree some older specimens in the London and Paris Museum, collected by Crossley and Humblot without any designation of locality on the label, but doubtless captured in the forests of the eastern lowlands. These birds measure : ♂♂ 75, 76, 79, 79, 79 ; ♀♀ 71, 74, 75, 76 mm. The birds originating from forests on a somewhat higher altitude, from Andapa, Fianarantsoa, Ankafana, are on an average bigger. They measure : ♂♂ 76, 77, 78, 79, 80, 80, 80 ; ♀♀ 75, 76, 76, 78 mm. All these birds I regard as typical *sharpei*.

In the mountains the birds are larger. Specimens from Manjakatompo measure: ♂♂ 80, 82, 82, 82, 84, 84, 84, 87; ♀♀ 79, 81, 82, 84 mm. Some specimens collected in "Betsileo," i.e. the interior high-plateau in the southern part of Madagascar, to the west of Fianarantsoa, measure: ♂♂ 80, 86; ♀ 82 mm. These somewhat larger birds I have called *interioris*. The two races thus measure:

M. i. sharpei: ♂♂ 75–80 (77·43), ♀♀ 71–78 (74·53) mm.

M. i. interioris: ♂♂ 80–87 (83·10), ♀♀ 79–84 (81·60) mm.

The differences in the measurements are best shown on the following schedule, giving the measurements of all specimens examined. As the females are smaller than the males, the two sexes are here kept apart.

Name of Subsp.	Wing-length in mm.:																
	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87
♂♂, *sharpei*	—	—	—	—	5	3	3	4	5	3	—	—	—	—	—	—	—
♂♂, *interioris*	—	—	—	—	—	—	—	—	—	2	—	3	—	3	—	1	1
♀♀, *sharpei*	2	1	1	2	4	3	1	1	—	—	—	—	—	—	—		
♀♀, *interioris*	—	—	—	—	—	—	—	—	1	—	1	2	—	1	—	—	—

I have not yet mentioned the type-specimen of *sharpei*, which is in the British Museum. This bird is named by Gray in *Ann. Mag. Nat. Hist.*, Vol. viii, 1871, p. 429, and it is thoroughly described by Sharpe in *Proc. Zool. Soc. London*, 1871, p. 317. The type-locality is Saralalan or Nossi Vola. According to Sharpe (*P.Z.S.*, 1870, p. 385) these places are situated south-east of Lake Alaotra, i.e. somewhere in the forest Sianaka, and the type must therefore belong to the *small* race. As a matter of fact, the type (an adult male) has a wing-length of 82 mm., whereas a series of eight other males from Sianaka measures 75–78 mm. (cf. above), and thus the type is an exceptionally big specimen.

Distribution: This subspecies occupies the interior high-plateau. It is met with on Betsileo and on Ankaratra. Perhaps it is now exterminated in the first locality, as the Franco-Anglo-American Expedition did not find it there, but it "existe encore dans la petite fôret de l'Ankaratra, sur le plateau central" (Delacour, *L'Oiseau*, 1932, p. 59).

Material: 54 specimens, which are distributed as follows:

39 *M. i. sharpei* (14 ♂♂, 10 ♀♀ in London; 10 ♂♂, 5 ♀♀ in Paris).

15 *M. i. interioris* (6 ♂♂, 3 ♀♀ in London; 4 ♂♂, 2 ♀♀ in Paris).

Remarks: The other races of *M. imerina* are of the same size as *interioris*, and so bigger than *sharpei*. I measure:

M. i. erythronota (Lav.): 10 ♂♂ 83–89; 6 ♀♀ 79–85 mm.

M. i. imerina (Hartl.): 7 ♂♂ 80–86; 3 ♀♀ 75–82 mm.

Nesillas typica monticola Hart. & Lav.

Nesillas typica monticola Hartert and Lavauden, *Bull. B.O.C.*, Vol. li, 1931, p. 56: Tsaratanana.

Description: The specimens from the Ankaratra Mountains have a pronounced tendency to be paler. The breast is not so heavily spotted, the markings on the throat, on the sides of the breast and on the flanks not so dark, the ground-colour is paler, creamy-white. The upper-parts are paler, not so reddish-brown or dark brownish-olive as the lowland forms, but greyish-green. However, there is a remarkable variation in the *Nesillas*, and many *monticola* are indistinguishable

from *typica*, but by comparison of series of the two forms the difference is easily seen.

Measurements : A slightly larger form. The measurements of the wing of the eastern lowland forms and the montane form are as follows :

N. t. typica : 19 ♂♂ from the following localities : Vondrozo, Ivohibe, Iampasika, Manombo, Fianarantsoa, Tabiky measure : 62, 62, 62, 63, 64, 64, 65, 66, 66, 66, 66, 66, 66, 66, 67, 67, 68, 68, 68 mm.

16 ♀♀ from the same localities : 58, 58, 59, 59, 59, 59, 60, 60, 60, 60, 61, 62, 62, 63, 63, 63 mm.

N. t. ellisii [1] *:* 64 ♂♂ from the following localities : Maromandia, Bezona, Marotony, Ambre Mountains, Tsarakibany, Vohemar, Andapa, Antalaha, Maroantsetra measure : 57, 57, 58, 59, 59, 59, 59, 60, 60, 60, 61, 61, 61, 61, 61, 61, 61, 61, 61, 61, 61, 62, 62, 62, 62, 62, 63, 63, 63, 63, 63, 63, 63, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 64, 65, 65, 65, 65, 65, 65, 65, 65, 65, 65, 66, 66, 66, 66, 66, 66, 67, 67, 68 mm.

39 ♀♀ from the same localities : 56, 56, 57, 57, 57, 57, 57, 58, 58, 58, 58, 58, 58, 58, 58, 58, 59, 59, 59, 59, 59, 59, 60, 60, 60, 60, 60, 60, 61, 61, 61, 61, 62, 62, 62, 64, 64, 64, 65 mm.

N. t. monticola : 12 ♂♂ from Manjakatompo and 1 from Tananarive measure : 66, 67, 67, 67, 68, 68, 68, 69, 70, 70, 71, 71, 72 mm.

4 ♀♀ from Manjakatompo : 64, 65, 66, 67 mm. The three forms thus measure :

N. t. typica : ♂♂ 62–68 (65·37), ♀♀ 58–63 (60·38) mm.
N. t. ellisii : ♂♂ 57–68 (62·06), ♀♀ 56–65 (59·49) mm.
N. t. monticola : ♂♂ 66–72 (68·77), ♀♀ 64–67 (65·50) mm.

The differences in the measurements are best shown on the following schedule, giving the measurements of all specimens examined. Male and female are different in size and are therefore here kept apart.

Name of Subsp. :	Wing-length in mm. :																
	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
♂♂, *ellisii* .	·	2	1	4	3	11	5	7	12	10	6	2	1	—	—	—	—
♂♂, *typica* .	—	—	—	—	—	—	3	1	2	1	7	2	3	—	—	—	—
♂♂, *monticola*	—	—	—	—	—	—	—	—	—	—	1	3	3	1	2	2	1
♀♀, *ellisii* .	2	5	9	6	6	4	3	—	3	1					—	—	—
♀♀, *typica* .	—	—	2	4	4	1	2	3	—	—	—	—	—	—	—	—	—
♀♀, *monticola*	—	—	—	—	—	—	—	—	1	1	1	1	—	—	—	—	—

It cannot be denied, that a difference exists between the lowland birds and *monticola*, but only about 50 per cent. of the mountain birds are larger than the lowland forms. Combined with the, on an average, paler colouration, this may suffice to separate the montane population as a subspecies, certainly rather ill-defined. As a matter of fact, I should not have separated this mountain form if a name (*monticola* Hart. & Lav.) was not available beforehand. However, as the mountain specimens of *Nesillas typica* show the same tendency to grow larger, as do the other birds mentioned, I prefer to give them their own designation. The

[1] Owing to the great variation in the *Nesillas*, the two races *typica* and *ellisii* cannot always be distinguished, but as a rule *ellisii* is darker and supplied with more lipochrome, the specimens being more yellowish on the underparts, more dark-green on the upperparts, the streaks on throat and breast being darker and broader.

great variation in size in *ellisii*, compared with the other forms, is probably owing to the fact that some younger birds must also have been measured. I really do not think *ellisii* is smaller than *typica*. The greater part of the very small *ellisii* came from the north-west (Marotony, Bezona, etc.). The type-specimen of *monticola*, which I have examined in the Paris Museum, comes from the Tsaratanana Mountains (Oct. 1929), and is the only specimen from this place. These mountains are situated in the northern parts of the country between Andapa and Anaborano, and are quite isolated from the Ankaratra Mountains in Central Madagascar, where my specimens were secured. The type is said to be a female and has a wing-length of 71 mm., thus being larger than all other females examined. But even for a male it is a remarkable size, which corresponds with the birds from Ankaratra. Specimens captured on the slopes of Tsaratanana (at Andapa at about 6,000 ft.) do not differ from *ellisii*, as already pointed out by Delacour (*Bull. B.O.C.*, Vol. liii, 1932, p. 95). The type of *monticola*, however, is secured on the very top of the mountains, at an altitude of about 9,500 ft. The type-specimen is of the same colour as *ellisii*, i.e. darker and more greenish than the Ankaratra birds from higher elevations, but the differences between all these birds are so small, that I certainly will not name the Ankaratra specimens.

Delacour recently has discussed this bird in *L'Oiseau*, 1931, p. 478, and *ibid.*, 1932, p. 85, and *Bull. B.O.C.*, 1932, p. 95. He comes to the conclusion that *monticola* must be regarded as a synonym of *ellisii*, but he compares the measurements only with the other big race *obscura*, not with the small form *ellisii*. *N. t. monticola*, however, is paler than *obscura*; especially the specimens from the Ankaratra Mountains cannot be confounded with *obscura*.

Distribution: The Ankaratra [1] and Tsaratanana Mountains.

Material: 156 specimens, which are distributed as follows:

35 *N. t. typica* (8 ♂♂, 7 ♀♀ in London; 11 ♂♂, 9 ♀♀ in Paris).

103 *N. t. ellisii* (29 ♂♂, 19 ♀♀ in London; 35 ♂♂, 20 ♀♀ in Paris).

18 *N. t. monticola* (7 ♂♂, 2 ♀♀ in London; 6 ♂♂, 3 ♀♀ [2] in Paris).

Remarks: The other forms of *Nesillas typica*, inhabiting Madagascar, are rather large. I measure:

N. t. obscura Del.: 7 ♂♂ 66–73; 3 ♀♀ 61–69 mm.

N. t. lantzii (Gr.): 6 ♂♂ 63–70; 7 ♀♀ 59–64 mm.

In addition, *Nesillas typica* inhabits some of the Comoro Islands, but the wing-length of the forms here (*brevicauda*, *longicauda*) does not exceed 67 mm.

In this investigation more than 700 specimens of the five species mentioned have been examined. It is now possible to say that at least four remarkable montane forms are developed in the interior of Madagascar, viz.: *Newtonia brunneicauda monticola*, *Zosterops maderaspatana analoga*, *Saxicola sibilla ankaratrae*, *Monticola imerina interioris*. To these I have added a fifth form, *Nesillas typica monticola* Hart. & Lav., previously described, which is rather ill-defined, but at any rate worthy of notice.

It is interesting to note that all five birds are modified in the same way, all being larger than their respective lowland form. The bigger size is the main character for these birds, and only by help of the difference in wing-length the couples of mountain and lowland forms may be distinguished. So under the

[1] A single specimen from Tananarive corresponds with this race.

[2] Including type of *monticola*.

similar ecological conditions in the mountains homologenous races have been differentiated. The larger size of the mountain-birds is probably a reaction against the lower temperature on the places at high altitudes. The waste of heat, caused by the radiation from the outer surface of an organism, is proportional to the area of the surface and to the difference between the temperature of the organism and the atmosphere. To keep the inner temperature of a homoeotherm animal at the normal height (in a bird about 42° C.), the organism, when living in a cold climate, is forced to augment its heat-capacity. An increased production of heat, however, is very troublesome or even perilous for the avian organism, and it therefore reduces the amount of heat lost to the atmosphere by diminishing the outer surface. The only method by which this can be undertaken in a bird is to increase the volume of the body ; the larger the bird grows, the smaller (*comparatively*) will be the surface, and on account of this the percentage of heat lost to the atmosphere will decrease (Bergmans rule).

To the difference in wing-length in some species is added a difference in colour of minor importance. In *Newtonia brunneicauda* the mountain race tends towards darker colours in the plumage, in *Nesillas typica* and *Monticola imerina* the mountain forms are somewhat paler than the lowland forms ; in *Zosterops maderaspatana* the throat is deeper yellow ; in *Saxicola torquata* no difference exists. Thus no rule appears to apply to the colouration, and all in all, the differences in colouration are very slight.

Besides these species several other birds are known to inhabit the interior parts of Madagascar, although the bird-life there is by far less rich than in the eastern coast-land. Several birds are very common on the high-plateau, e.g. *Cisticola cherina*, *Mirafra hova*, *Motacilla flaviventris*, &c., and in the forests around Manjakatompo *Nectarinia souimanga*, *Tchitrea mutata*, *Foudia omissa*, *Leptosomus discolor* and several others are met with ; none of which, however, differ from the forms inhabiting the coastal regions.

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NOVITATES ZOOLOGICAE

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ON THE SABULODES (LEP. GEOMETRIDAE) OF THE MONASTICA DOGN. GROUP.

By LOUIS B. PROUT.

THE delimitation and sectionizing of the genus *Sabulodes* Guen. (*Ur. et Phal.*, ix. 42, 1858) on any acceptable phylogenetic system would be an enormous undertaking, since it would entail an examination not only of the very many species which have actually been placed here by our recent writers on the Neotropical fauna, but also of a mass of evidently more or less nearly related "genera" which, so far as I can yet see, differ therefrom in little or nothing except wing-shape or scheme of markings. The purpose of the present article is not taxonomic in any broad sense, but merely elucidatory of a very small and apparently "natural" section which has occasionally been referred to under the unpublished name of *Cosmophyga*. I have no intention of validating that name unless, or until, some exigency of reclassification arises.

Whether *S. privataria* Walk. (1862, as *Laudosia*) = *aliculata* Feld. (1875, as *Laudosia* ?) (Venezuela), with its subspecies *molorcharia* Ob. (1911) (Bolivia and Peru) should be regarded as strictly a member of this group is somewhat uncertain; the structure, the underside and the markings of the forewing above, as well as the wing-shape, show a close resemblance, but the unmarked white or whitish hindwing, with only the termen and abdominal region sharing the coloration of the forewing, speaks for a different resting posture. In any case, this character and the whitish *distal* edging of the antemedian line of the forewing differentiate it at a glance from the *monastica* group, sens. str.

Dognin (*Le Nat.*, xv. 159, 1893, as *Laudosia*) founded *monastica* on material from Loja. In a later reference (*Ann. Soc. Ent. Belg.*, lvi. 138, 1912) he admitted that he had regarded the group then under consideration as a single variable species and—somewhat remarkably in view of the accuracy of his eye for specific and racial distinctions and his zeal for new forms—had not regarded No. 2 in the present memoir as worthy of a separate name. More curiously still, there is evidence in my collection that he confused No. 3 with *thermidora* Th.-Mieg (1894, as *Epione* ?), for he has labelled a Torné ♂ which I submitted to him for determination some 25 years ago "*Periclina thermidora* Th.-M."; and this notwithstanding that he had also given me a specimen of the very distinct *thermidora* (vera), from the type locality Loja, labelled as "*Periclina thermidora*, absolutely identical to type." I can only conclude, therefore, that he had given

no really close attention to the group. It is hardly necessary to add that the present revision is not penned in any carping spirit ; no one who has attempted any work at the overwhelmingly rich Geometrid fauna of tropical South America will need to be reminded that no single student, however diligent, can compass the whole with thoroughness.

The following simple key will, I trust, elucidate the forms at present known to me. The appended descriptions will add the necessary detail.

KEY TO THE SPECIES.

1. Forewing relatively elongate anteriorly, costal edge not white 2
   Forewing relatively shorter, costal edge pure white 3
2. Forewing approaching fawn, costal edge brighter but hardly paler . . . . . sp. 1. *monastica* Dogn.
   Forewing much darker (closely irrorated with bistre), costal edge pale buff . . . . . sp. 2.
3. Moderately dark, lines distinct, finely (but as a rule distinctly) white-edged . . . . . sp. 3. *mosticana* Dogn.
   Very dark, lines indistinct, not appreciably white-edged . . . . . sp. 4 (Peru).

1. **Sabulodes monastica** (Dogn.).

Laudosia monastica Dogn., *Le Nat.*, xv. 159 (1893) (Loja).

Sabulodes monasticaria (pars typ.) Oberth., *Et. Lép. Comp.*, v. (2), p. 44 (1911) (Loja) (err. transcr. pro *monastica*).

Cosmophyga (*Laudosia*) *monastica* Dogn., *Ann. Soc. Ent. Belg.*, lvi. p. 138 (1912).

Only known to me from Loja, where ♂♂ are apparently common. They have been freely distributed by their author and do not need much further elucidation. The antemedian line of the forewing is more acutely angled in the cell than in Nos. 2–4 and in consequence generally pursues thereafter a course much more nearly parallel with the postmedian. In rare cases the angulation is maintained by a still more oblique course from costa to cell and its subsequent direction can show more approach to that of No. 2. The underside is generally paler than the others (except occasionally No. 3) and has the apical patch of the forewing and the incomplete outer band of the hindwing brighter brown, sharply differentiated.

2. **Sabulodes cosmatina** sp. n.

Sabulodes monasticaria part., Oberth., *Et. Lép. Comp.*, v. (2), p. 44, t. xcii, f. 904 (1911) (Chachapoyas, Amazonas) (err. transcr. et det.).

Cosmophyga (*Laudosia*) *monastica* var. *monasticaria* Dogn., *Ann. Soc. Ent. Belg.*, lvi. 138 (1912) (nom. invalid., ex Oberth.).

" *Cosmophyga mosticana* Dogn.," Warr., M.S. (in coll. Tring Mus. (crr. det.) (E. Peru).

Closely related to *monastica*, possibly a race, though its distribution (Colombia, Peru) and some well-appreciable differences in the genitalia render this improbable. Similar in size and shape. Fillet (in sens. Meyr.) and shaft of antenna with some whiter scaling. Body and wings darker, more fuscous.—— *Forewing* with costal edge pale buff ; cell-mark less distinct than in *monastica* but more elongate ; antemedian line more bluntly angled in cell, thereafter, more or less markedly approaching the postmedian ; postmedian more slender

than in *monastica* ; subterminal dark vein-dashes indicated, but only distinct in the least dark forms.——*Hindwing* with corresponding postmedian.—— Underside with rather heavy grey irroration, the distal cloudings duller than in *monastica*, generally less sharply defined.

Genitalia (♂) very similar to those of *monastica* ; valve with a ridge-like process proximally to its middle, which is wanting in *monastica* ; aedoeagus with a thorn-like projection much less near to its extremity than the corresponding one in *monastica*, and with an additional prominence more proximally.

Colombia : Torné, Cauca Valley. E. Peru : Chachapoyas (Amazonas), Huancabamba (Cerro de Pasco), Oconeque, Agualani and Limbani (Carabaya), type from Huancabamba, in Tring Mus.

The forms from Torné and Chachapoyas seem to be a trifle less dark than those which I have treated as typical, but I am not prepared to give them a subspecific name unless the difference should prove constant in much more extensive material.

The name (or misnomer) *monasticaria*, tentatively adopted by Dognin, is certainly invalid, a mere result of Oberthür's nomenclatorial vagaries. Whether an oversight or intention, the suffix *-aria* is demonstrably not intended to indicate a new name [1] ; his statement is quite explicit : " je *conserve le nom* sous lequel j'ai reçu un échantillon de *Loja* (Equateur) " (italics mine), his appropriation of the name (" *monasticaria*, *Obthr.*") is an outcrop of the inevitable " *pas de bonne figure*," etc. (compare " *mimulata*, *Obthr.*" on p. 43, which refers to absolutely typical *mimula* Th.-Mieg) and the figuring of an inaccurate *monasticaria* arises from his having (like Dognin) " lumped " our Nos. 1 and 2. A new name and description have consequently been found necessary.

3. **Sabulodes mosticana** Dogn.

Cirsodes mosticana Dogn., *Ann. Soc. Ent. Belg.*, xliv. p. 226 (1900) (Loja).

♂♀, 39–43 mm. (1 ♀ 48 mm.). Smaller than *cosmatina*, ground-colour similar, perhaps on an average scarcely so dark.——*Forewing* a little broader, with costa relatively shorter, termen slightly more convex in middle ; costal edge pure white ; markings nearly as in *cosmatina*, the antemedian generally still less bent near costa, the long straight part of its course more oblique, reaching hindmargin nearer to postmedian ; pale line at base of fringe less conspicuous than in *cosmatina*.——*Hindwing* generally slightly more bent at R^3 than in *cosmatina* ; otherwise very similar ; the line generally a trifle more distal, at least at hindmargin, and less rigidly straight ; fringe as on forewing.——Underside coloured about as in *cosmatina*, the distal cloudings generally ampler ; weak traces of a postmedian line at times visible.

Genitalia (♂) with valve considerably narrower at tip than in the two preceding, its end ventrally rounded off gently instead of prominent ; a process from base of uncus characteristic of the group (? socius), much longer than in the two preceding.

Colombia, at considerable altitudes : Paso del Quindiu, 2,500 m., Monte Tolima, 2,700 to 3,200 m., Pacho, 2,200 m. Type form from Loja only known to me from the description, perhaps a separate race.

[1] Following Guenée, he makes every Geometrid name in this memoir end in *-ata* or *-aria*, with the sole exception of a few dedicatory names, such as *schunckei* ; thus *crocoptera* Koll. becomes *crocopterata*, *clisthena* Stoll in Cram. *clisthenata*, and so on.

As f. **torneënsis,** form. nov., I describe 3 ♂♂ of a decidedly brown tone (inclining towards Verona brown), the white costal edge of the forewing narrower, the white edging to the lines very slight, grisescent, the underside also somewhat more suffused with brown and with the apical cloud of the forewing not quite as broad as in high-altitude *mosticana*.

Torné, Cauca Valley, perhaps a local race or an "ab. loc." It gives somewhat the impression of a different species, but no difference is discoverable in the genitalia.

From the variable *S. thermidora* (Th.-Mieg, 1894), to the darkest aberrations of which it bears a good deal of resemblance, *mosticana* f. *torneënsis* can easily be distinguished by the whiter antenna, white costal edge, sharper lines, with hardly even a trace of paler edging, and different underside (apical cloud weak or obsolescent, distal shade of hindwing very weak or wanting, postmedian line of forewing developed, at least anteriorly).

4. **Sabulodes socoides** sp. n.

Size and shape about as in *mosticana*, which it perhaps represents in Peru; build rather more robust. Darker, the markings weaker, the lines practically without any pale edging, the antemedian almost obsolete anteriorly. Underside with the distal cloudings less broad than in the typical high-altitude *mosticana*, less brown-tinged than in its form *torneënsis*.

Genitalia (♂) with the valve in some measure intermediate between those of *monastica* and *mosticana* but nearer to the former in its approximately uniform breadth throughout and prominence at the distal ventral extremity; "socii" longer and broader than in *monastica* but not so long as in *mosticana*; aedoeagus stouter than in *cosmatina*, its nearest Huancabamba relative.

E. Peru: Huancabamba, Cerro de Pasco, 4 ♂♂, the type in coll. Tring Mus.; Cushi, Huanuco, 1 ♂ in that collection; Pozuzo, Huanuco, 1 ♂ in coll. Brit. Mus.

NEW GEOMETRIDAE FROM EAST JAVA.

By LOUIS B. PROUT.

SURPRISINGLY little has hitherto been known of the Geometrid fauna of East Java. It has therefore been a task of considerable interest to work through some collections received thence by the Tring Museum during the past few years. The time is not yet ripe for publishing an even moderately complete list of Javan Geometridae, and I propose to leave the many new faunistic records for other occasions; but the species and races which are new to science reach a goodly number and are well worthy of immediate attention.

First came a relatively small but valuable collection from Mr. J. P. A. Kalis from Trettes, 3,000 feet, May 1932, and Kangean Island (Karuazu and Aerkohkep), April 1932, particularly important for the records; several obviously or very probably new species or races belonged mostly to obscure or difficult groups, or were represented only by single specimens, so that their publication has had to be deferred. More recently (April 1933 and onward) Mr. A. M. R. Wegner and he have made very extensive collections, chiefly at Nongkodjadjar, 4,000 feet, Djoenggo (Ardjoeno), 4,500 feet, Singolangoe (Tengger), 5,000 feet and Kletak (Tengger), 6,000 feet. In the following descriptions it has been considered unnecessary to repeat the details every time these localities are referred to.

Subfam. **OENOCHROMINAE.**

1. **Ozola apparata multiplex** subsp. n.

♂♀, 33–36 mm. Extremely variable in the extent of the markings, but agreeing entirely with *a. apparata* Prout (1928) in their position and general form. Considerably smaller, the costal streak of the forewing almost invariably broken in places into spots or dashes, not so black as in *a. apparata*, seldom, if ever, showing the steady widening distally to which attention was called in the description of the latter; apical patch very rarely containing any noticeable white maculation, absolutely concolorous with the dark maculation of the costa. The variation in this species does not appear to be sexual.

Nongkodjadjar, 9 ♂♂, 2 ♀♀, including the type ♂; Singolangoe, 1 ♂, 2 ♀♀; Djoenggo, 2 ♂♂, 2 ♀♀.

2. **Ozola spilotis pausteria** subsp. n.

♂♀, 34–38 mm. Considerably larger than *s. spilotis* Meyr. (1897), all the blackish maculation reduced in size or quantity (except in an aberration described below); in particular the median series almost entirely obsolete excepting sometimes at the folds of the forewing, the subterminal and terminal spots not confluent into a subapical patch, the subterminals of the hindwing quite small; in the type ♂ the cell-spot of the hindwing is also minute, but this does not apply to the rest of the series. The dark costal streak, so characteristic of the species, remains rather broad, though slightly variable individually.

Singolangoe, 3 ♂♂, 1 ♀, including the type; Djoenggo, June 1934, 2 ♀♀.

One ♂ and one Djoenggo ♀ represent a striking aberration, both wings

with a rather broad terminal band, formed by the almost entire confluence of the subterminal and terminal series of spots; it is very distinct from all forms of *apparata* in the clear median area, etc.

SUBFAM. **HEMITHEINAE.**

3. **Archaeobalbis holelaica** sp. n.

♀, 52 mm. Palpus with 3rd joint shortish-moderate (about as in *cristata* Warr., 1894, ♀, or a trifle shorter). Head and body above concolorous with upperside of wings; body beneath concolorous with underside of wings, legs darker.

Forewing rather uniform olive-green, the dentate lines scarcely visible in slightly darker green; costal region faintly darker; cell-mark small, a trifle larger than the black "pupil" of *cristata* but without definite grey circumscription; the brown, blackish-mixed maculation outside the postmedian weak and incomplete, not noticeable except an irregularly furcate mark between the radials and an irregular stripe from between the medians to hindmargin; terminal dots moderate.——*Hindwing* similar, the cell-spot (dot) a little smaller.

Underside of a nondescript whitish, tinged with olive-buff, nearest that of *cristata* ab. *subopalina* Warr., perhaps slightly greyer; cell-spots rather smaller than in *cristata*; outer band narrow, shadowy, brownish, with scarcely any vinaceous tinge.

Djoenggo, Ardjoeno, 4,500 feet, May 1934 (J. P. A. Kalis), 1 ♀.

Evidently nearest to *cristata*, conceivably a race thereof.

4. **Neobalbis flavibasalis hemiticheres** subsp. n.

♂♀. Differs from *f. flavibasalis* (Warr., 1896) in that the blackish outer band of the underside is much less broad, behind the middle narrower than the white area which separates it from the termen, whereas in all the forms hitherto known it closely approaches the termen, especially on the forewing, between the radials often reaching thereto.

E. Java: Singolangoe, the type ♂ and 2 ♀♀; Waterfall Baoeng, 1,200 feet, 1 ♀ and Djoenggo, 1 ♀ (J. P. A. Kalis).

The ♂ is about normal in size, both the ♀♀ very large (length of a forewing 27–28 mm., against 23–25 for normal ♀♀). Warren's type locality "Java" should, I think, read "West Java."

5. **Pingasa atropa** sp. n.

♂, 48–52 mm.; ♀, 53–54 mm. At first sight closely similar to *chlora* (Stoll, 1782), though definitely larger than *P. c. javensis* Warr. (1894), with which it was taken. Easily distinguished as follows:

Face more buff, inclining to orange in upper part and without the black upper edge. Palpus of ♂ with 3rd joint appreciably shorter. Wings rather more closely (though finely) irrorated with grey than in most *chlora*, an intensification of the bright red scales particularly manifest in the postmedian costal spot of the forewing, the strong vein-dots or short teeth on outerside of postmedian and on hindwing towards the abdominal margin; antemedian of forewing almost straight from costa to M at base of M^2 and even between this and SM^2 only weakly excurved (a sharp contrast to the twice strongly outbent line of

chlora). Underside with the subterminal band attenuated and incomplete, about as in rather extreme examples of *elutriata* Prout (1916), on forewing developed only from costa about to radial fold, on hindwing lost, or almost lost, between the radial and the medians, submacular anteriorly and posteriorly.

Nongkodjadjar, January to June, 13 ♂♂, 3 ♀♀, including the ♂ type; Singolangoe, 10 ♂♂, 8 ♀♀; Djoenggo, 5 ♂♂, 6 ♀♀; Kletak, 6 ♂♂, 1 ♀.

6. **Dindica polyphaenaria sundae** subsp. n.

Thoracic tufts with less red admixture than in *p. polyphaenaria* (Guen.). Forewing generally with termen slightly less oblique anteriorly; more uniform in colour. Hindwing with the yellow ground-colour less projecting outward in the middle; the proximal edge of the dark border roughened by dark vein-dots. Underside with much white between the yellow ground-colour and the (generally more or less narrowed) dark outer band; anterior part of this band on the forewing always red (in *p. polyphaenaria* rarely so).

Nongkodjadjar, Djoenggo, Singolangoe and Kletak, a good series. I unite with them a ♀ from Mondoktoempang, W. Bali, October 1934 (J. P. A. Kalis) and provisionally the Sumatran race although that may perhaps prove, on closer study, somewhat intermediate or in some other way racially differentiable.

7. **Agathia abacta** sp. n.

♀, 46–48 mm. In shape, coloration, palpal length, etc., similar to *lycaenaria* (Koll., 1844), abdomen with the brown maculation, however, more as in *lycaenidia* Bastelb. (1911) or *maculimargo* Prout (1912).

Forewing with the usual basal patch and costal border; median band (row of spots) rather large, the first and second spots at about 8 mm. from base, separated only by the radial fold (hind fork of cell-fold), the posterior one at 6 to 5 mm., reaching from fold to hindmargin, twice slightly incurved (on left wing therefore somewhat suggesting a thick figure 3); outer band unusually proximal (at least in its posterior part), anteriorly midway between median band and apex, its interruptions about as those of the median, its central element (between radial fold and M^2) strongly incurved and broadening in cellule 3, greatly attenuated before M^2, its hind spot rather broad, with its centre about 3 mm. from tornus; terminal line very slightly interrupted midway between the veins, expanded apically into a quadrate spot, at R^2, M^1 and M^2 into slight (much flattened) triangles, at R^3 into a less small triangle.——*Hindwing* with the band even more proximally placed than in the ♀ of *maculimargo*, to which it probably comes nearest, on an average fully 5 mm. from termen, inbent and thickened between SC^2 and R^1, very characteristically formed between R^3 and M^2, where it is twice very deeply incurved, with a resultant sharp prong outward on M^1; terminal line with slight expansions on SC^2 and R^1 and a large one at and proximal to the tail-- about as in *lycaenaria* but with the enclosed white spot much broader, almost circular.

Underside with the principal markings showing, but reduced.

Nongkodjadjar, January 1934, type ♀; Singolangoe, 1 ♀.

Apart from the still more proximally placed band, the hindwing is very distinct from that of *maculimargo* in the presence of the (large) white tail-spot.

8. **Tanaorhinus vittata kalisi** subsp. n.

♂♀, 42–46 mm. Coloration less contrasting than in the other races of *vittata* (Moore, 1867), the pale parts (except the covered costal margin of the hindwing) being less white, the green line through the postmedian band relatively broad; median area of forewing less narrowed posteriorly than in the other races, slightly variable, but typically measuring 4·5 mm. at hindmargin. Underside pale green with rather conspicuous broad grey-green postmedian line.

Djoenggo, Ardjoeno, 4,500 feet, May–June 1934, 9 ♂♂ (J. P. A. Kalis), including the type; Kletak, 1 ♂; Nongkodjadjar, 1 ♀.

9. **Oenospila strix gemmans** subsp. n.

♂♀. Differs from *s. strix* (Butl., 1889, N. India) in that the blotch at middle of abdominal margin of hindwing is reduced, reaching the fold instead of M^2, and the fringes of both wings green, with pink spots at the veins, only on the hindwing apically with the pink suffusion which overspreads them in *s. strix*.

Singolangoe, June 1934, type ♂, April 1934, allotype ♀; Djoenggo, June 1934, 2 ♀♀.

10. **Hemithea nigriparmata** sp. n.

♂, 32 mm. Very near *melalopha* Prout (1931), from Luzon. Larger; abdomen and apparently the valves (no dissection made) relatively longer, the crests somewhat less large, the anterior one narrow, reddish, black-edged laterally, the posterior predominantly black, rounded off behind.——*Forewing* with apex not produced, termen still less gibbous than in *melalopha* (thus considerably less than in *quadripunctata* Warr., 1896); markings almost identical, the white marks which accompany the faint lines a little more conspicuous, especially those which run from SM^2 to hindmargin.——*Hindwing* decidedly more elongate abdominally than in *melalopha*; markings about the same.——Underside, as in *melalopha*, unmarked; fringe green in proximal part, greyer in distal.

Trettes, 1 ♂.

11. **Hemithea tranquilla** sp. n.

♂, 24 mm. Like *simplex* Warr. (1897), but with the hindtibial process more strongly developed, abdominal crests minute and pale, forewing with costal edge only sparsely dark-dotted, lines not dark-shaded in median area, the postmedian of the forewing slender and only weakly undulating, while that of *simplex* has the deep sinuosities of the *insularia* Guen. group.

Nongkodjadjar, January 1934, the type in very perfect condition. Trettes, 2 ♂♂, one fairly good, the other discoloured.

12. **Hemithea vesta** sp. n.

♂, 20 mm. Smaller than *simplex* and *tranquilla*. Face somewhat lighter (probably clear green when fresh, but somewhat faded). Palpus appreciably shorter (about 1¼). Antenna proportionately stouter, with the ciliation dense and rather longer (well over 1). Abdominal crests very slight, concolorous.——*Forewing* somewhat blunter, with termen less oblique; in the strong dark costal maculation and traces of dark-green edges to the lines in median area nearer to *simplex* than to *tranquilla*, though the dark green is slender and inconspicuous; postmedian line slightly curved near costa, but without appreciable further

curvature, though slightly (extremely slightly except at the radials) lunulate inward between the veins.——*Hindwing* much less strongly angled than in *simplex* and *tranquilla*, only about as in typical *Chlorissa* ; postmedian line much less sinuous than in the allies.

Trettes, 1 ♂. A worn ♀ from the same locality and clearly belonging to it (though the costal edge has almost lost its maculation) measures fully 23 mm. In both examples R^1 of the forewing is connate with $SC^{2\ 5}$ and R^3 with M^1.

13. **Hemithea perfida** sp. n.

♂, 20 mm. Might at first sight be mistaken for a sport of the preceding, with both wings more triangular, the termen of the forewing being very straight, that of the hindwing also less convex than in *vesta*, the bend in the middle extremely slight, the tornal region somewhat prolonged. Antenna slender, with ciliation not quite 1. Hindtibial process longer than the spurs (in *vesta* shorter). ——*Forewing* with costal edge white ; postmedian line a little less oblique than termen (in the allies parallel with it), virtually straight and entirely without crenulation or lunules.——*Hindwing* with postmedian virtually straight.

Trettes, 1 ♂.

The forewing has both R^1 and R^3 perceptibly though only very slightly stalked. The genitalia differ from those of *vesta*, both in the shape of the dorsal part of the valve, which is longer, tapering, pointed (in *vesta* broad to near end, blunt) and in the armature of the sacculus, which consists of an ample bed of spines (more as in the genotype, *aestivaria* Hb.), while *vesta* shows only a very narrow ridge.

14. **Comostola hyptiostega** sp. n.

♂, 22–23 mm. Antennal pectinations very long (*chlorargyra* group). Coloration nearly as in *chlorargyra* (Walk., 1861, the most bluish-green species hitherto described in the group) or with a slightly bluer or greyer tinge ; the irregularly infuscated dorsum of the abdomen almost without white admixture, the paler parts (notably the basal patch) being predominantly flesh-colour.—— *Forewing* with the borders and cell-mark almost exactly as in *confusa* Warr. (1905), but with the spot which projects forward at the end of the hindmargin broader and its enclosed shading largely light-reddish ; this spot (which in the rest of the group may always be called pyramidal or conical) four-sided, crossing M^2 and with a flat but sloping "roof" which runs from M^2 proximad in the direction of the hinder end of the cell-mark.

Djoenggo, Ardjoeno, 4,500 feet, June 1934 (J. P. A. Kalis), 2 ♂♂. This is one of the group of forms mentioned in vol. xii of Seitz (p. 131) as probable races of *confusa* Warr. or—comprehensively—of *minutata* (Druce, 1888) ; pending a thorough revision, I give it a binomial designation.

Subfam. **STERRHINAE.**

15. **Dithecodes specialis** sp. n.

♂♀, 27–30 mm. Near the well-known *idaea* (Swinh., 1892) of the Khasis. Antenna of ♂ with the pedicellate fascicles still longer (about as in *inornata* [Warr., 1896]). Abdomen beneath strongly tufted. Hindfemur and tibia of ♂ with dense tufts and pencils, in part reddish-mixed.——*Forewing* with apex slightly more produced than in *idaea* ; distal areole generally very small ; colora-

tion and markings virtually as in *idaea* ; black cell-dot relatively a little larger, grey lines a little less weak, teeth of postmedian rather stronger, an interrupted terminal rather more definitely indicated, the dots at the veins not quite so cleanly white.——*Hindwing* with similar distinctions and with a black dot between the white cell-dots, curiously reminiscent of some South American *Dithecodes*.——Underside of the ♂ characterized by the development of coarse specialized scaling, of a similar rusty reddish colour to that of *D. inornata aniara* Prout (1934) but slightly browner, the distribution different, that of the forewing being slighter and more restricted to the proximal part than that of the hindwing ; on the latter it covers the greater part of the wing, leaving free only a pale terminal area of less than 3 mm. width anteriorly and gradually narrowing to scarcely over 1 mm. posteriorly.

Singolangoe (loc. typ.), April–May, 4 ♂♂, 2 ♀♀ ; Nongkodjadjar, 8 ♀♀ ; Djoenggo, 1 ♂, 4 ♀♀ ; Waterfall Baoeng, 1,200 feet, 3 ♀♀.

16. **Calothysanis punctinervis piperata** subsp. n.

♂♀. More densely dark-irrorated than *p. punctinervis* (Prout, 1916) from W. Java, cell-dots often enlarged, postmedian line of hindwing nearly straight.

Nongkodjadjar and Singolangoe, a series of over 20, the type ♂ from Nongkodjadjar.

The two ♀♀ from E. Java (Tosari, 7,000–9,000 feet) which I associated with the ♂ holotype (Sindanglaya, 3,600–4,000 feet) belong to the new race. The Tring Museum has both sexes of the name-typical western race.

17. **Problepsis exanimata** sp. n.

♂, 38 mm. ; ♀, 41–43 mm. Face dirty whitish, the upper part fuscous. Vertex blackish. Antenna light brown ; pectinations in ♂ moderate (3 or 4), about as in *magna* Warr. (1906) or scarcely longer. Hindtarsus of ♂ less than ½ tibia (about as in *magna*).

Wings white, without the brownish suffusions of the near allies (about as in *sancta* Meyr., 1888, or the African *Problepsis*).——*Forewing* with costal edge very little darkened ; ocellus roundish, rather less large than in *magna*, its outer ring rather slender, not quite regular, light brown, dark spots (sprinkled with the metallic scales) distributed within its circumference, the central part pale ; the shadowy lines (narrow bands) grey, not brownish ; median line bearing a very small yellow-brown spot in front of SM^2, with some silvery scales proximally and distally ; postmedian somewhat oblique outward to R^1, incurved between the radials, then almost straight ; subterminal spots regular, about as in *magna* ; the smaller spots between this and termen well developed (as in *korinchiana* Rothsch., 1920, or more confluent) ; terminal line developing small interneural spots in its anterior part.——*Hindwing* with the " ocellus " (R^1 to M^1) narrow, ill-defined, the brownish marks in cell which, in most of the species, bound it proximally quite obsolete, so that there remain only the silver spots in and behind end of cell, a slight grey dash on DC^2 and the outer silver series with a slight accompaniment of dark scales ; silvery markings at middle of SM^2 normal ; postmedian line and both the outer series of spots continued ; terminal line slender.

Underside with the principal markings faintly visible.

Nongkodjadjar, 1 ♂, 2 ♀♀; Djoenggo, 2 ♀♀; Singolangoe, Tengger, 1 ♀. The British Museum has a ♀ from Mt. Ardjoeno and one from "S. Java" (Fruhstorfer).

18. **Scopula mecysma mesites** subsp. n.

♂♀. Much darker than *m. mecysma* (Swinh., 1894), excepting occasional aberrations thereof, the colour approximating closely to that of its larger relative *violacea* Warr. (1897). Forewing with antemedian and median lines less rigidly straight; postmedian with appreciable sinus between the radials (less pronounced than in *violacea*) and a decidedly stronger one posteriorly. Hindwing with proximal line a little less fine and less firm than in *m. mecysma*, not quite so obliquely placed.

Singolangoe, type and another ♂; Nongkodjadjar, 2 ♀♀.

19. **Scopula wegneri** sp. n.

♂♀. Near *tosariensis* Prout (1923), which occurs with it in both its known localities. With attention, however, very easy to distinguish.

Face with slightly more extended white or whitish lower part. Hindtibial pencil of ♂ stronger.——*Forewing* with a slightly more brownish tinge and generally with stronger irroration; postmedian line appreciably farther from termen and with a deeper sinus between the radials; median shade much less straight than in *tosariensis*; terminal dots sharp, well isolated on the underside (where in *tosariensis* they are connected by a line).——*Hindwing* with similar distinctions.

Eighth sternite of ♂ with the right ceras long, the left aborted (in *tosariensis* vice versa).

Nongkodjadjar (loc. typ.) and Singolangoe, a series of 20 in all.

Subfam. **LARENTIINAE.**

20. **Gonanticlea penicilla amblia** subsp. n.

♂, 35–37 mm.; ♀, 40 mm. Differs from *p. penicilla* Prout (1932, W. Sumatra), apart from its slightly larger size, in the strong dark suffusions of the hindwing and underside, which—as in the dark forms of *occlusata* (Feld., 1875)—dim, or in large part entirely suppress, the bright orange of *p. penicilla*. Median band of ♂ paler than in this; ♀ much like an overgrown dark *occlusata* ♀ (the provisional reference to the sex in Nov. Zool., xxxviii. 104, is confirmed).

Nongkodjadjar, 2 ♂♂, 1 ♀; Singolangoe, 1 ♂.

In describing this species I neglected to note the interesting specialization of the ♂ antenna; the end is darkened and very appreciably fusiform, recalling the genus *Rhopalodes*.

21. **Ecliptopera odontoplia** sp. n.

♂, 42–46 mm.; ♀, 46–50 mm. Very similar to *ctenoplia* Prout (1931), distinguished as follows:

On an average larger.[1] Antenna of ♂ merely serrate, with fascicles of quite short cilia.——*Forewing* with the broad median band more uniformly dark, its traversing lines less noticeable, its whitish boundary-lines with some well-appreci-

[1] "52" in the original description of *ctenoplia* was an unfortunate misprint for "42," compare the remark "smaller" [than *zophera* Prout]; the actual measurements of the *ctenoplia* now known to me are: ♂, 41–44 mm.; ♀, 43–47 mm.

able differences (see below) ; dark terminal patch between apex and R^3 generally broader.——*Hindwing* very uniformly dark grey, not becoming paler costally nor (as in some ♂♂ of *ctenoplia*) apically, even the pale distal edging of the postmedian line quite indistinct.——Underside much less (in the type form hardly at all) variegated with pale buff.

Singolangoe, 5 ♂♂, 6 ♀♀ (collected with 3 ♂♂ and 1 ♀ of *ctenoplia*). Further examples subsequently received from other Tengger localities.

Both this species and *ctenoplia* have proved to be variable, especially perhaps in the ♀ ; the intermediate areas of the forewing may be almost concolorous with the median band or strongly differentiated in brown (*odontoplia*) or more olivescent (*ctenoplia*). The lines which bound the median area (which were not described in detail in the original account of *ctenoplia*) also vary slightly, yet present some useful differential characters between the two Tengger *Ecliptopera* ; the antemedian shows in *ctenoplia* some marked irregularities in its posterior half which are not observable in *odontoplia*, either an acute tooth outward at fold or a pronounced lobe inward between this and SM^2 (or generally both) being developed ; the postmedian shows slighter outward projections between R^3 and M^2 in *odontoplia* than in *ctenoplia*. Finally, the dark ♀♀ of *ctenoplia* (and to some extent the ♂♂) show a pale olivaceous-buff subterminal spot from M^1 to before R^3 which is wanting in *odontoplia*.

22. **Photoscotosia multiplicata erebenna** subsp. n.

Forewing considerably darker than *m. multiplicata* Warr. (1898, Ardjoeno, 8,000 feet), commonly dark almost throughout, sometimes with the ground-colour pale, in that case without the " reddish " brown tone of the name-typical form ; in some aberrations some reddish gloss developed in the pale parts of the median area only.——*Hindwing* with the dark parts much more blackish than in *m. multiplicata*.

Mt. Moenggal, 9,000 feet (Bromo to Caldeira), January 1934 (J. P. A. Kalis), a very long series of both sexes, including a few of ab. *atrifasciata* Warr. (1899), better entitled to that appellation than Warren's dark-brown-banded type.

23. **Collix griseipalpis oblitera** subsp. n.

♂, 31 mm. Rather smaller and narrower-winged than *g. griseipalpis* Wileman (1916), less glossy and more weakly marked, the lines almost obliterated, even their costal commencements on the forewing less black than in the other races ; the white subterminal dots very small. Underside nearly normal, but with blackish subterminal spots on the grey outer band obsolescent.

Nongkodjadjar, 1 ♂.

2 ♀♀ from Djoenggo, subsequently received, are larger than the ♂ (35 and 36 mm.), but otherwise conformable.

24. **Chloroclystis pallidivirens pullivirens** subsp. n.

Much darker (grey-)green than *p. pallidivirens* Warr. (1903 ; on the discovery of the ♀ made genotype of *Ptychotheca* Warr., 1906), the reddish scaling replaced by black or blackish ; forewing with postmedian line somewhat more strongly oblique inward in anterior part ; termen of hindwing slightly more strongly sinuous.

Nongkodjadjar, 4 ♂♂, 4 ♀♀, including the type ; Singolangoe, 2 ♂♂, 6 ♀♀ ; Kletak, 6 ♀♀. A ♂ and 5 ♀♀ from Tosari, 7,000–9,000 feet (E. A. Cockayne) in my collection have long awaited description.

25. **Chloroclystis thaumasta** sp. n.

♂, 27 mm. Head and body nearly as in the well-known Indian *chlorophilata* (Walk., 1862), the face, with the well-developed cone, whiter, the light-brown palpus mixed with black on basal joint.

Forewing distorted tornally, the termen bending inward from M^1 to M^2, the terminal region and fringe bearing on the underside, from the median interspace to the hindmargin, long specialized scaling and along the termen itself a dense ridge of suberect brown hair-scaling ; colour and markings almost as in *chlorophilata*, the costal marks rather larger and blacker, the terminal rather blacker, an ill-defined white median suffusion (broadest and most definite anteriorly), the white subterminal much better developed than in *chlorophilata*.——*Hindwing* with costa almost straight, apex produced to an acute angle at C, termen thence extremely oblique inward to a bend about R^3, the tornal part thereafter produced into a rounded lobe ; SC^2–R^1 stalked to $\frac{1}{2}$, then violently divaricating, radials widely separated, R^3–M^1 connate ; the whole wing, including the coarse fringes, specialized, only the abdominal region on the upperside normally scaled (green, with black bands) ; the triangular anterior part on upperside vitreous, with a small patch of buffy light-brown scaling in the furcation of SC^2-R^1, the posterior lobe with long blackish and deep-green hair-scaling, the fringe of this part equally dark.

Forewing beneath much as in *chlorophilata* but rather darker, the oval patch of specialized scaling at M^2 wanting, its function being obviously served by the larger tornal patch. Hindwing beneath clothed with specialized blackish scaling.

Kletak, Tengger, 6,000 feet, May 10, 1934, 1 ♂.

A remarkable development, somewhat analogous to *triangularis* Warr., 1895, in *Sauris* (section *Dystypoptila*).

26. **Acolutha pulchella interposita** subsp. n.

♂, 22 mm. Intermediate in size and colouring between *p. pulchella* (Hmpsn., 1891, India) and *p. semifulva* Warr. (1905, Hainan), the brown costal region of the forewing not quite so dark as in the former and not suffusing the base, the yellow area less irrorated posteriorly, the double postmedian line more sharply defined by white distally, the delicate white-grey and violet-grey of the termen and of the hindwing clearer than in *p. pulchella*, the hindwing altogether more variegated, the bandlike yellow suffusion outside its cell better developed, the two outer bands conspicuously dark-spotted in their posterior part, as in *p. semifulva*.

Nongkodjadjar, 3 ♂♂.

27. **Acolutha pictaria flavifascia** subsp. n.

Upperside with the yellow bands broader and brighter than in *p. pictaria* (Moore, 1888). Underside of the forewing with the brown costal part rather broad and not, or scarcely, encroached upon by the white ground-colour which,

in *p. pictaria*, tends to separate the apical patch from the proximal-costal streak.

Trettes, 1 ♀; Nongkodjadjar (loc. typ.), a good series; Singolangoe, 2 ♂♂, 2 ♀♀.

SUBFAM. **GEOMETRINAE.**

28. **Hemerophila canidorsata nychia** subsp. n.

Variable, but almost always readily distinguishable from the Indian races of *canidorsata* Walk. (1866) by the heavy slaty-blackish cloudings, which darken the abdomen dorsally and may suffuse almost the whole of the ♂ hindwing and a great part of its forewing (leaving more or less free the brown distal-costal patch and some parts of the distal and hindmarginal areas) or, when less extended, will be at least conspicuous in the basal and the anterior median regions of the forewing and in some fasciation outside the postmedian of both wings. Even in the ♀, which (as in all the forms) is far more variegated, there is a characteristic darkening distally about the radials, and perhaps the 1st median, of the forewing and the band outside the postmedian of the hindwing is heavier than in most Indian forms. The white subterminal dot of the hindwing on the radial fold usually stands out very sharply. Underside proximally more whitish (less brown) than in the most similar *c. canidorsata* and with the subterminal band rarely so well formed. A rare ♂ aberration, with less clouding, is almost equally characteristic on account of the intensified, though narrow, dark shades which accompany the principal lines.

Nongkodjadjar, very common; Singolangoe; Trettes; Djoenggo.

The hair on hindwing beneath, though strong and coarse at abdominal margin, is scarcely so extended forward as in the other races, scarcely reaching radial fold.

29. **Medasina strixaria longirama** subsp. n.

♂, 71–80 mm.; ♀, 90–98 mm. Nearest to *M. s. celebensis* Prout (*Bull. Hill Mus.*, ii. 252), but with the ♂ much darker, its pale parts colder, less ochreous in tone, the terminal markings beneath whiter.

Nongkodjadjar (loc. typ.); Singolangoe; Djoenggo; Kletak. A good series.

30. **Medasina nigrifasciata circumplexa** subsp. n.

♂♀. Differs from *M. n. nigrifasciata* (Warr., 1896, as *Parasynegia*) in having all the subsidiary black spots (first three costal, radial at termen and the one hindmarginal) on the forewing enlarged, the broad anterior part of the submarginal fascia of the hindwing, on the other hand, obsolete.

Tengger: Singolangoe, April June 1934, the type and 3 other ♂♂, 1 ♀; Kletak, June 1934 (J. P. A. Kalis), 2 ♂♂.

Warren's type, from "S. Java" (Fruhstorfer)—i.e. the southern part of West Java—has remained unique, but the racial distinctions are probably constant. By venation the species is a "*Medasina*" in sens. Hmpsn., possibly remotely related to *reticulata* Hmpsn., 1895, but very distinct from anything else yet known.

31. **Xandrames latiferaria mulsa** subsp. n.

Very similar to *X. l. curvistriga* Warr. (1894), from the Khasis. The dark ground-colour less mixed with brown, especially apically on the forewing and

terminally on the hindwing ; the broad whitish band of forewing distally almost straight-edged, proximally with the ground-colour projecting into it somewhat less sharply behind M^1 than in *l. curvistriga* ; the two blackish lines on the apical patch, or at least the second one (the distal), narrower ; the pale terminal line of the hindwing rather better differentiated on the underside.

Singolangoe, the type ♂. Mt. Gedeh, a ♂ in coll. Brit. Mus. Two ♂♂ of a similar, but larger and brighter form (probably a separable race) were collected in S.W. Sumatra by the Pratts for the late Mr. J. J. Joicey. I know of no other Malaysian material in the group except *cuccozona* Prout (1926), which is provisionally regarded as a separate species.

32. **Cleora variegata convariata** subsp. n.

On an average a trifle larger than *v. variegata* (Moore, 1867) and (*v.* ?) *hypopoecila* Prout (1928). Variable, but generally easy to distinguish from both (especially *hypopoecila*) by the more sombre appearance of the ♂ upperside, due to an intensification of the dark clouding in the distal and part of the proximal area of the forewing, sometimes also the median area ; underside of the ♂ more brightly ochre-yellow than in *variegata*, closely resembling that of *hypopoecila*, the dark band of the hindwing generally obsolete posteriorly or even throughout ; cell-spots fairly large.

Nongkodjadjar (loc. typ.) ; Singolangoe ; Djoenggo ; Ardjoeno ; Kletak, an enormous series.

If the slight structural deviations from *variegata* which I have noticed in *hypopoecila*—antennal pectinations somewhat longer, costal margin of hindwing at base slightly more expanded—prove constant and of sufficient taxonomic value, the two island races will stand as *C. h. hypopoecila* and *C. h. convariata*. So far as checked, the pectinations in these continue about to joint 40, in *C. variegata* not quite so far.

33. **Alcis** (?) **melangraphes** sp. n.

♂♀, 22–29 mm. Close to *A.* (?) *albigrisea* (Warr.),[1] of which I at first supposed it a well-differentiated race. Antenna of the ♂ with the pectinations

[1] *Fidonia albigrisea* Warr., Nov. Zool., iii. 407 (1896) (W. Java). Founded on a single ♂ in good condition (but that the antennae, except a short basal remnant, are lost), which has never been matched, nor hitherto closely approached. Warren's description is good up to a point, but the generic placing was altogether wide of the mark—presumably due to the chequered fringes and some vague reminiscence of whitish *Fidonia* (sens. lat.) *carbonaria* (Cl.) or ♀ *atomaria* (L.), the somewhat more similar *Chiasmia glarearia* (Brahm) being debarred, from Warren's point of view, by its non-pectinate antenna—and not a single structural detail was given. It is therefore desirable, in erecting a closely related species of somewhat anomalous phylogenetic position, to supplement the original description extensively.

Face with appressed scales. Palpus short (scarcely over 1), rough-scaled. Tongue well developed. Antenna of ♂ pectinate. Hindtibia of ♂ dilated, with a groove, no doubt concealing a hair-pencil, but not attended by any basal abdominal spine. Forewing not crenulate ; fovea strong ; SC^1 from SC^2 near its base, running into C. Hindwing with termen not crenulate, only with the minutest concavity between the radials. Apparently a link between *Alcis* (sens. lat.) and *Abraxas*, in many respects agreeing with *Alcis* (?) *concinna* Warr. (1906). Expanse 24 mm. *Forewing* : the " double curved fascia " is the antemedian with its attendant proximal shade, and is almost as near the cell-mark as is the median shade, the close approach of these two lines being about M^2 and the fold ; the " broad submarginal fascia " extends from the white subterminal line to the tips of the outward teeth of the postmedian (Warren's " exterior lunulate line ") ; the subterminal line is rather thick, sends out a projection proximad in cellule 6, and curves outward behind M^2 to a slight tornal spot.

moderate, diminishing gradually, apical fourth (approximately) non-pectinate. Hindtibia more strongly dilated; basal abdominal spine well developed.—— *Forewing* with termen anteriorly a trifle more oblique; venation typically as in *albigrisea* type, but variable, SC^1 connate (very occasionally even from cell) to moderately stalked with SC^2, usually running into C, sometimes a weak end of C escaping after rather long anastomosis; markings very variable in extent, always essentially as in *albigrisea*, but somewhat blacker; cell-mark strong; subterminal decidedly more sinuous between the anterior projection and the posterior curve; proximal subterminal shade often more spotted with white; a midterminal white spot, often more conspicuous than in *albigrisea* type, where it is small and bracket-shaped.——*Hindwing* with termen slightly less smooth than in *albigrisea*; generally less irrorated; postmedian line as well developed as median, or more so; posterior part of proximal subterminal shade often strong and rather thick.——Underside as upper (perhaps a further suggestion to Warren of "*Fidonia*").

Singolangoe, 22 ♂♂, 11 ♀♀, including the type ♂; Nongkodjadjar and Kletak (Tengger), rather shorter series; Djoenggo (Ardjoeno), 2 ♀♀.

34. **Ectropis anisodroma** sp. n.

♀, 50 mm. From the well-known Indo-Malayan representatives of the *crepuscularia* [Schiff.] group—*bhurmitra* (Walk., 1860) and *dentilineata* (Moore, 1867), with their races and nearest allies, including the *longiscapia* Prout (1926) of the Tengger district—distinguishable as follows:

Forewing appreciably broader, with termen less oblique; dark irroration quite sparse; cell-mark strengthened, elongate; lines less oblique; antemedian (after its subcostal angulations) almost straight; median almost straight, well proximal to cell-mark; postmedian very little beyond cell-mark, straightish from costa to median (only with rather thick black outward teeth on R^1 and M), weakly incurved between M and a small black tooth on SM^2; a small light-buff spot in base of cellule 3, offset by the more cinnamon, blackish-mixed shade which follows (i.e. the characteristic double tooth-mark of the group); pale area between outer shade of postmedian and subterminal broadened and clear.—— *Hindwing* with the postmedian decidedly more sinuous than in the allies, incurved behind the tooth at base of R^3–M^1, strongly oblique behind.

The ground-colour (probably variable) is intermediate between the white of *longiscapia* ♀ and the ochreous tint of most *bhurmitra*, the ochreous or brownish of the transverse shades with a faint suggestion of olivaceous. The whitish underside shows the cell-mark of the forewing and indistinct indications of the two principal lines; subterminal shade scarcely indicated except as a distinct costal mark (forewing only).

Kletak, Tengger, 6,000 feet, May 1934 (J. P. A. Kalis), the type only. A ♀ from Tosari (E. A. Cockayne) has long stood unnamed in my collection.

35. **Ectropis simplaria meseres** subsp. n.

♂♀. Less brownish-tinged, both above and beneath, than *s. simplaria* (Swinh., 1894), the subterminal shades of the upperside stronger; altogether intermediate towards *submarginata* (Warr., 1906), which is probably a further race.

Nongkodjadjar, a moderate series, besides a few from the other localities, up to 6,000 feet.

36. **Ruttelerona kalisi** sp. n.

♂, 42–46 mm. ; ♀, 44–49 mm. Structure about as in the genotype (*cessaria* Walk., 1860). Head, body and ground-colour of wings more olive-tinted than in any other *Ruttelerona*. Face largely blackish, showing a narrow area (in ♀) or less narrow (in ♂) above and below of the ground-colour.

Wings, as in most *Ruttelerona*, considerably darker in the ♀ than in the ♂. ——*Forewing* with termen appreciably less oblique than in *cessaria*, less crenulate than in the *lithina* (Warr., 1903) group ; an ill-defined, fairly broad, dull reddish suffusion along hindmargin from near base to near termen ; cell-spot blackish, less large than in *cessaria* ; median line and—at least in the ♂—the postmedian and sometimes the antemedian forming black spots at costa ; antemedian slender, ill-defined, irregularly sinuous ; median rather thick, at least in middle and at hindmargin, fairly direct, crossing the cell-spot ; postmedian from scarcely $\frac{2}{3}$ costa, punctuated on the veins, slightly incurved between costa and R^1 and still more slightly between the radials, from R^3 markedly oblique inward, at hind margin meeting the postmedian of the hindwing ; subterminal showing slender pale, proximally black-filled lunules, less strongly interrupted than in most *Ruttelerona* ; distal area not strongly darkened, only with ill-defined longitudinal streaks ; terminal black marks lunular ; fringe with pale line at base and slight pale intersection.——*Hindwing* crenate, rather more evenly than in most of the allies ; markings of forewing continued ; median area, especially in the ♂, markedly paler than the rest ; postmedian line different from that of any previously known *Ruttelerona* in that it bulges definitely at R^3–M^1 and curves rather strongly inward between M^2 and SM^2 ; distal area rather irregularly clouded, the subterminal more macular anteriorly and forming a broad continuous pale streak from abdominal margin about to M^2.

Underside with the same general scheme as in the other species, the form of the principal markings as distinctive as above.

Trettes, May 1932, 1 ♀, which was held over for further material ; Nongkodjadjar, January–May 1934, 6 ♀♀ ; Singolangoe, April 1934, 2 ♂♂, one of them made holotype ; Kletak, June 1934, 2 ♂♂, 2 ♀♀ ; Djoenggo, June 1934, 2 ♀♀.

37. **Racotis neonephria** sp. n.

♂, 49–54 mm. (rarely smaller). Similar to *inconclusa* (Walk., 1860). Antennal fascicles similarly long and with the outer series (from about the 14th to the 32nd) set on triangular teeth. Tone browner (considerably less olivaceous than in fresh *inconclusa*, less ochreous than in faded ones) ; abdomen above with a very noticeable reddish patch at base.——*Forewing* with the markings generally somewhat less blurred, a pale patch between median and postmedian lines at base of R^3 and M^1 (just discoverable, with close attention, in most *Racotis*) here arrestingly conspicuous, very light buff ; postmedian line generally better developed, after the deep inward curve at M^2 almost perpendicular, only with a small black tooth at SM^2.——*Hindwing* with the cell-mark subovate or reniform, with a pale centre (thus more as in *boarmiaria* Guen. than in *inconclusa*) ; postmedian less sinuous and considerably less deeply dentate than in *inconclusa*, the duplicating shades outside it generally much weaker.——Underside less

clean-looking and less buff than in *inconclusa*, the band much less black, on the hindwing often much less complete (approximating to that of the following species), on the forewing without the large and conspicuous pale apical spot.

Djoenggo, Ardjoeno, 4,500 feet, June 1934, 3 ♂♂, including the type; Nongkodjadjar, 3 ♂♂, 1 ♀; Singolangoe, 2 ♂♂, 1 ♀; Kletak, May 1934, 1 ♂; Waterfall Baoeng, 1,200 feet, July 1934, 1 ♂.

The ♀♀ expand 52–54 mm., are still browner, still less dark-coloured above, the lines rather strong; the antennal ciliation at base seems less long than in *inconclusa* ♀.

38. **Racotis anaglyptica** sp. n.

♂♀, 50–51 mm. Structurally distinct from *inconclusa* and *neonephria* in the decidedly less long fascicles of the ♂ antenna (scarcely over 2) and the quite rudimentary teeth from which they spring; thus agreeing with the Indian (*boarmiaria* form. ?) *obliterata* Warr. (1894), to which it might almost be attached as a race.

Head and body concolorous with wings; abdomen with some conspicuous paired brown spots, which become very ill-developed on the posterior segments.

Forewing very slightly narrower than in the allies; olivescent, but looking much paler and more variegated than Javan *inconclusa*, the parts between the lines (especially an almost entire band between median and postmedian) conspicuously pale, the dark markings strong; markings, except for their greater intensity, almost exactly as in *obliterata*, only the broad dark part of median shade (M^2 to hindmargin) still more broadened, blackest at its edges.——*Hindwing* with abdominal margin slightly less long than in *inconclusa*; coloration and sharpness of markings as on forewing and similarly differentiated from those of *obliterata*.

Underside as in the more extreme *obliterata* or as in fairly well-marked *cogens* Prout (1929); only in the ♀ with the borders more complete, confusingly similar to some ♂♂ of *neonephria*.

Kletak, Tengger, 6,000 feet, June 1934, 4 ♂♂; Djoenggo, Ardjoeno, 4,500 feet, June 1934, 1 ♀, with the antennal cilation about as in *neonephria*.

39. **Necyopa anetotasis** sp. n.

♂, 28–32 mm. In the head, body and forewing, so far as has yet been made out, an exact counterpart of heavily marked *triangularis* (Warr., 1896, as *Polylophodes*) from W. Java, i.e. with the fuscous markings a good deal mixed with velvety black, usually forming rather strong ante- and postmedian bands. ——*Hindwing* also very similar to that of *triangularis* but definitely less produced to the tornus, the markings distinct across the entire wing, the whole distal area (except the restricted green parts) usually suffused with deeper violet-grey; beneath with the specialized tornal clothing less dense and much more restricted (in *triangularis* it extends narrowly to before R^3, in *anetotasis* it scarcely crosses M^1), the markings here strengthened, the postmedian approaching nearer to hindmargin, the distal area with large additional subterminal spot on M^1, sometimes reaching to M^2.

♀ the same, but with the hindwing not elongate tornally.

Kletak, Tengger, 6,000 feet, May and June 1934, 33 ♂♂, 5 ♀♀ (the type series); also similar but shorter series from Nongkodjadjar, Singolangoe and Djoenggo, the ♂♂ always equally preponderant.

The distinction in the hindwing shape can be roughly indicated by even "macroscopic" measurements; in *triangularis* each of the three margins measures about 10 mm., in *anetotasis* of similar size the costal about 10 mm., each of the others about 9 mm. Antenna of ♂ pectinated to at least joint 40; *subtriangula* Prout (1932, Kinabalu) differs not only in the antenna, but in the slightly more pronounced anal lobe of the hindwing, less acute projections of the postmedian line, less strong band-like shade outside it, but generally stronger subterminal band beneath (these last points, however, variable).

40. **Craspedosis nigriclathrata plera** subsp. n.

♂♀. Different from *C. n. nigriclathrata* (Warr., 1896, Soekaboemi) in the much amplified black markings: oblique subbasal band of forewing, and generally of hindwing, two or three times as broad, apical and terminal patch of hindwing considerably widened, the enclosed white marks reduced or obsolete; black terminal wedge-marks of hindwing so much enlarged as almost to become confluent with subterminal band, merely enclosing small oblong or triangular white spots.

Singolangoe, type ♂ and 2 ♀♀; Nongkodjadjar, 1 ♀; Djoenggo, 20 ♂♂, 2 ♀♀; Waterfall Baoeng, 1,200 feet, July 1934 (J. P. A. Kalis), 2 ♀♀.

Although only the original ♂ of the West Javan form is known to me, there is little doubt that here, as so generally, we have to deal with two valid races.

41. **Abraxas wegneri** sp. n.

♀, 48–56 mm. Head and body orange, with the usual black markings heavy (about as in strongly marked *invasata* Warr., 1897).

Forewing with $SC^{1\,2}$ rather shortly or moderately stalked, SC^1 running into C; white; basal area (about 2 mm.) mixed orange and black, bounded by a narrow black band which is typically interrupted (in an aberration constricted) midway between M and SM^2; the rest of the wing typically unmarked except by an irregular costal and a less irregular distal black border, the former in places encroaching into the cell, its posterior edge submacular (in the Singolangoe ♀ with the first spot between SC^5 and R^1 isolated, through a constriction of this part of the border), the latter between 3 mm. and 4 mm. wide, its proximal edge merely undulate.——*Hindwing* fairly broad, termen waved; white; basal patch narrower than on forewing; a very small black spot at costa before middle; a roundish black spot at about $\frac{3}{5}$ abdominal margin, bounded by SM^2; a black distal border, manifestly double, consisting of a solid terminal element 1 mm. to over 2 mm. wide from C to abdominal margin and a chain of large subterminal spots from costal to abdominal margin, centred on the veins, partially confluent with one another and largely confluent with the terminal element.

Underside the same.

Nongkodjadjar, March and April 1934, the type and 3 others; Singolangoe, 1 ♀.

Certainly variable, but very distinct in its elegant bordering. The type and one other are asymmetrical in possessing on the left hindwing an additional (small) spot in anterior angle of cell; another has the same on right hindwing only; the three Nongkodjadjar paratypes have the black borders a little broadened, a rather large black cell-spot developed and sometimes a few small (asym-

metrical) spots scattered on each forewing. The Singolangoe ♀ varies in the opposite direction, the borders being narrow, the distal ones enclosing some white marking.

Just as we go to press, a ♂ and 2 ♀♀ from Djoenggo come to hand, one ♀ normal, the other similar to the last described, the ♂ smaller (42 mm.) with the subterminal spots of the hindwing completely free from the black border and even the corresponding markings of the forewing showing this composite formation (roundish subterminal spots only slightly confluent with black border). Antennal fascicles of the ♂ fairly long (the longest nearly 2), hindwing of ♂ with costal expansion near base, cell with a small foveal formation near base, dilatation of hindtibia moderate.

42. **Semiothisa lalage** sp. n.

♂, 31–35 mm. Antennal ciliation about 1. Hindtibial pencil well developed. Head and body concolorous with wings ; upper edge of face with some blackish scaling ; abdomen dorsally with paired spots, the anterior pairs blackish, the posterior ones browner, to obsolescent.

Forewing rather narrow, the termen with anterior excision strong, behind it strongly oblique (about as *alternaria* Hb. or slightly more elongate) ; $SC^{1\,2}$ coincident, free ; variable, typically whitish buff with more or less fawn-coloured tinge, the distal area more definitely suffused with fawn (in some examples coloured almost like the ♀, see below) ; some rather sparse dark and very sparse black irroration ; costal edge with irregular black dots and streaks, at the beginning of the lines with outwardly oblique dark marks, the first two rather thick, the postmedian slender and longer, about SC^5 meeting a large, thick, comma-shaped dark mark which runs from costa (nearer the apex) in the opposite direction ; cell-dot black ; antemedian and median lines grey, the former slender, the latter weak outside the cell-dot, fairly thick from M (just beyond base of M^2) to hindmargin, oblique inward, between the medians slightly sinuate ; postmedian acutely produced outward in its anterior part, but interrupted just in front of R^1 by a whitish streak which runs from apex, the rest of its course in the type-form emphasized by a very thick and sharply marked blackish line (much as in *tenuiata* Stgr., Seitz' *Macrolep.*, iv. t. 18 i, though more strongly bent) ; a dark shade connecting this line with the mark round the terminal excision, which is also thick and blackish ; termen posteriorly with small black vein-dots. ——*Hindwing* with the tail pronounced ; concolorous with forewing ; a black cell-dot ; median line double, proximal thereto, incurved in cell ; the blackish postmedian continued, straightish, thickest in its middle part ; a wavy whitish subterminal less indefinite than on forewing ; proximal to it a blackish spot between R^3 and M^1, usually slenderly connected with the middle of the postmedian ; termen with black marks at veins.

Underside gay, with much more ferruginous shading (strongest outside the postmedian line) ; irroration, at least in proximal part, stronger and coarser ; markings of upperside reproduced with little modification, median darker, postmedian of forewing in its anterior sweep weakened, a slender straightish line (the true postmedian ?) running from it at R^3 to the costal spot ; apical streak of forewing and subterminal of hindwing purer white, the hindwing with some additional white apically.

♀ generally larger ; darker and much duller (about as dark as *feraliata* Guen.,

Oberth., *Et. Lép.*, xx. fig. 4751, but slightly more violaceous and without the red-brown shades), postmedian line slender, markings otherwise approximately as in the ♂.

Nongkodjadjar (loc. typ.); Singolangoe; Kletak; Djoenggo, 4,500 feet; a good series.

Certainly close to "*Evarzia*" *tripunctata* Warr. (1899, S. Flores), only known from the type ♂, perhaps a race; but as Warren's description brings out nothing which I should have needed to emphasize I have perforce described it independently. Slightly narrower-winged, more sharply marked, the "three dots" on the postmedian of the hindwing nearly always united (in only one example showing the tripartite formation), the "true postmedian?" (which is faintly discernible even on the upperside, though not mentioned there in either of our descriptions) straighter, being in *tripunctata* type definitely excurved, but of course much less deeply than in the apparent postmedian.

43. **Semiothisa temeraria cruda** subsp. n.

♂♀. Greyer or less ochreous-tinged than *S. t. temeraria* (Swinh., 1891), with more appreciable white admixture close to the apex of the forewing (sometimes forming a more definite white spot); median shade broader, particularly on the forewing from the cell hindward; postmedian line of hindwing generally stronger, especially beneath.

Nongkodjadjar, the type ♂; Singolangoe, 1 ♂, 6 ♀♀; Djoenggo, 5 ♀♀.

In addition to the above, there are 3 ♀♀ of ab. *fumosa* Warr (1896), correspondingly darker than the Khasi type of that melanochroic form, the blackest cloudings more extended. Singolangoe, 2; Kletak, 1.

44. **Semiothisa perspicuaria pleres** subsp. n.

♂♀. On an average somewhat smaller than *S. p. perspicuaria* (Moore, 1867), much less warmly coloured, the upperside darker, much more heavily irrorated, especially in the ♂, the purplish-grey suffusion of the terminal area of the forewing commonly continued, especially in the ♂♂, as a subterminal band on the hindwing, the conspicuous blackish subterminal spot of the hindwing, on the other hand, commonly weakened, sometimes almost obsolete.

Nongkodjadjar (including the type ♂), Singolangoe and Kletak, good series; Djoenggo, 1 ♂, 3 ♀♀.

An interesting melanochroic aberration occurs in this race also, in all the localities and in both sexes, 6 examples altogether, and may be called ab. **fumosa** nov.: ground-colour above and beneath very largely, or almost entirely, suffused with dark purple-grey, sometimes with a brown admixture; an ill-defined pale area persists in the posterior part of the terminal area of the hindwing, also the white subapical spot of the forewing; abdomen strongly infuscated.

45. **Callerinnys combusta flammida** subsp. n.

♂, 30–32 mm. Rather smaller than *c. combusta* (Warr., 1893), colour more uniform bright orange or reddish orange, the dark blotches of distal area much reduced in extent, the postmedian line of the hindwing straightish to near hind-margin, thus approaching the median and narrowing the pale interspace, in which there remains little sign of the white spot at the radials; cell-dot of hindwing conspicuous.

Nongkodjadjar, 2 ♂♂. A larger, browner ♂ from Singolangoe is evidently a striking aberration of the same.

The same or a closely similar race occurs in Sumatra (Korintji and Padang Bovenland).

46. **Hydatocapnia marginata demensa** subsp. n.

Closely similar to the name-typical *marginata* Warr. (1893) of North India. Upperside duller, more suffused with grey, the basal patch of the forewing generally strengthened posteriorly. Underside with the borders narrower, less variable, on the forewing reaching only a width of 4 mm. at C (its widest part), on both wings—especially in the ♀♀—becoming pale, or at least paler-mixed at termen.

Nongkodjadjar, 3 ♂♂, 11 ♀♀, including the type ♂; Singolangoe, 1 ♂, 11 ♀♀; Kletak, 2 ♀♀.

A new species for Malaysia.

SOME NEW *ARCTIINAE*.

By LORD ROTHSCHILD, Ph.D., F.R.S.

1. **Thyrarctia cedo-nulli griseata** subsp. nov.

♂. Differs from *Th. c. cedo-nulli* Stoll (1782) above in having the non-vitreous parts of the wings and the body pure grey, not brownish yellow-grey. Below, the white margin to the vitreous and semivitreous patches at end of cell on forewing is absent.

4 ♂♂, Rio Grande, British Honduras, April 1933 (coll. J. J. White).

2. **Evius albitegula** sp. nov.

♂. Pectus and underside of thorax and abdomen white ; legs white ; fore-coxae crimson, palpi whitish, 3rd joint and inner surface pale brown ; antennae yellowish brown, serrated ; head and patagia orange strongly suffused with fiery red ; tegulae crimson-brown with broad central white band and fringed with long brown hair ; thorax crimson-brown ; abdomen crimson, anal tuft white.

Forewing : basal oblique half deep cinnamon-brown, outer and lower $\frac{2}{3}$ of this basal half paler, a short crimson basal streak on vein 1, and an outer crimson margin to this oblique half ; outer half semivitreous lemon yellow ; outer $\frac{2}{3}$ of costa whitish. Hindwings deep salmon-pink.

Underside of fore- and hindwings cream-white, basal half of forewings heavily suffused with crimson.

Length of forewing 17 mm., expanse 38 mm.

17 ♂♂, Hansa Humboldt, Sta. Catharina, Nov. 1932, and Jaragua do Sul, Sta. Catharina, Oct. 1932 (Anton Maller and F. Hoffmann coll.).

3. **Automolis devitta** sp. nov.

♂. Resembles most *A. reducta* Walk. (1856), but the sooty oblique band of the forewing from apex to inner margin is absent, the forewings being entirely cream-buff with a small sooty dot on vein 1 and a steel-grey band on costo-subcostal region from base to $\frac{2}{5}$ from apex. Hindwings orange-buff. Forewing shorter than in *reducta*.

Length of forewing, *reducta*, 18 mm., *devitta* 16 mm.

Expanse of forewing, *reducta* 41 mm., *devitta* 36 mm.

1 ♂, Hansa Humboldt, Sta. Catharina, Jan. 1933 (Anton Maller coll.).

As *A. r. sordida* Rothsch. (1917, Nov. Zool., xxiv. p. 480) is preoccupied, I rename it **A. reducta sordidior** n. n.

4. **Automolis sordida pygmaea** subsp. nov.

♂. Differs from *A. s. sordida* Rothsch. (1909) in being much smaller, and in having the greyish pink bands and spots in the apical $\frac{1}{3}$ of forewing quite distinct and sharply defined.

Length of forewing *s. sordida* 15 mm., expanse 34 mm.

Length of forewing *s. pygmaea* 11 mm., expanse 25 mm.

1 ♂, Amazons (ex coll. Meyer) ; 1♂, Pará, type (A. Miles Moss coll.).

5. **Automolis alboatra intensa** subsp. nov.

♂. Differs from *A. a. alboatra* Rothsch. (1909) in all the black bands and apex of forewings being broader and deeper black.

1 ♂, Costa Rica (Underwood coll.).

6. **Automolis unifascia tenuis** subsp. nov.

♀. Differs from *A. u. unifascia* Druce (1899) in the dark brown bands of the forewings being much reduced and narrower.

1 ♀, Rio Grande, British Honduras (J. J. White).

I think, when sufficient series have been collected, it will be found that *Automolis unifascia* Druce (1899), *A. apicata* Schaus (1905), *A. hamifera* Dogn. (1907) and *A. alboatra* Rothsch. (1909) will turn out to be one species. Seitz has already stated this as a fact.

7. **Automolis pulcherrima** sp. nov.

This beautiful new species belongs to the *flammans* group of *Automolis*, but is unlike any known species.

♂. Pectus scarlet-crimson; legs reddish scarlet with whitish dots at the base of the coxae; palpi, head and thorax deep vermilion; patagia deep vermilion with a black spot ringed with dull yellow; shoulders milk-white, tegulae deep vermilion; a black spot ringed with dull yellow on thorax; abdomen dull brownish pink; antennae golden brown. Forewings cream-white, a minute black dot at base, followed by a vermilion transverse line below median line and 3 black streaks above it, beyond these black streaks three zigzag bands of vermilion, the outer one interrupted from just below vein 2 to above vein 3; outer $\frac{1}{3}$ of costal area vermilion, basal $\frac{2}{5}$ of outer half of wing dotted with black and bearing 3 crimson spots above vein 6, along the veins from the outer margin to $\frac{1}{3}$ of the length of each vein a vermilion band runs into the wing edged with black. Hindwing semivitreous white. Length of forewing 22 mm., expanse 51 mm.

1 ♂, Viannopolis, Goyaz, Dec. 1931 (coll. R. Spitz).

8. **Automolis schistacea** Rothsch. (1910) ab. **subapicalis** ab. nov.

In this specimen the oblique subapical yellowish buff band on the forewings is fully developed both on the upper- and underside.

1 ♂, Las Quiguas, San Esteban, Venezuela (S. M. Klages coll.).

I think when we have larger series, *A. flavicincta* Herr.-Sch. (1856); *A. griseonitens* Rothsch. (1909); *A. ardesiaca* Rothsch. (1909); and *A. schistacea* Rothsch. (1910) will all have to be treated as subspecies.

9. **Automolis pseudoprumala** sp. nov.

♂. Allied to *A. prumaloides* Rothsch. (1909). Pectus, legs and palpi white, antennae brown, head and thorax mummy brown, abdomen intense crimson.

Forewing inner half obliquely mummy brown with 2 subbasal black dots, outward edge zigzag; outer half semivitreous cream-colour with black dots on the veins and a black-brown inverted query mark towards apex. Hindwings

salmon-rose, a black-brown dot at end of vein 3. Other specimens have the hindwings white tinged with rose.

Length of forewing 16 mm., expanse 36 mm.

3 ♂♂, Hansa Humboldt, Sept. 1932, and 5 ♂♂, 1 ♀, Jaragua do Sul, Sta. Catharina, Oct. 1932 (A. Maller and F. Hoffmann coll.); type ♂ Hansa Humboldt.

10. **Automolis pallidinervis** sp. nov.

♂♀. Nearest to *A. rosenbergi* Rothsch. (1909).

Pectus, legs and head black, vertex edged with orange; outer half of patagia orange, inner half black; tegulae orange edged with black; thorax and abdomen black, lateral rows and 3 praeterminal segments of abdomen metallic blue, two rows of orange spots on the underside of abdomen.

Forewings black-brown, somewhat glossed with blue in certain lights, nervures whitish grey, an oblique band of bright orange somewhat curved distad runs from the outer margin at vein 6 to almost the base of the wing on vein 1. Hindwings black, costal $\frac{2}{5}$ buffish orange.

Length of forewing ♂ 19½ mm., ♀ 25 mm., expanse ♂ 43 mm., ♀ 57 mm.

3 ♂♂, 1 ♀, Alto da Sierra, São Paulo, April 1925 (R. Spitz coll.); 10 ♂♂, 5 ♀♀, Hansa Humboldt, Sta. Catharina, Aug. 1932 (A. Maller), type ♂; 10 ♂♂, 2 ♀♀, Jaragua do Sul, Sta. Catharina, Nov. 1932 (F. Hoffmann coll.).

11. **Automolis flavicostalis** sp. nov.

♂. Differs from *A. lineosa* Walk. (1869) in the basal $\frac{3}{5}$ of the costo-subcostal area of the forewing and the area below vein 1 being golden yellow, in the lower sides of abdomen having an olive-rufous patch, which is only occasionally indicated in *lineosa* (compared with 20 ♂♂ and 3 ♀♀ of *lineosa*, same locality).

Length of forewing and expanse the same as in *lineosa*.

8 ♂♂, Jaragua do Sul, Sta. Catharina, Sept. 1932 (F. Hoffmann coll.).

12. **Automolis salma whitei** subsp. nov.

♂. Differs from *A. salma salma* Druce (1896) in having the black spot at the end of vein 1 much smaller and the dark patch at tornus of hindwing absent.

2 ♂♂, Punta Gorda, British Honduras, July 1933 (J. J. White coll.).

13. **Automolis spitzi** sp. nov.

♂. Differs from *A. flavicincta* H.-Sch. (1856) above in the orange bands being much narrower on forewing, and in having an orange band on the tegulae. Below it differs in the orange on the abdomen being absent from the two praeanal segments and the irregular antemedian band on forewing and the distal edges of the pale basal half of hindwing.

Length of forewing 18 mm., expanse 42 mm.

1 ♂, São Paulo, Cantareira, April 1931 (R. Spitz coll.).

14. **Automolis tegulata aurantiaca** subsp. nov.

♂. Very similar to *A. a. tegulata* Rothsch. (1933), but all the pale markings rich orange-buff and the black ground-colour much deeper.

1 ♂, Jaragua do Sul, Sta. Catharina, Sept. 1932 (F. Hoffmann coll.).

15. **Automolis immarginata** ab. **flava** ab. nov.

♀. Differs from *A. immarginata* Rothsch. (1933) in having the pale markings orange-buff, not creamy white, and the small line running in from the outer margin of forewing along vein 2 being replaced by a large spot.

1 ♂, Alto da Serra, São Paulo, June 1924 (R. Spitz coll.).

16. **Hyperthaema punctata** sp. nov.

♂. Resembles *H. coccinata* Schaus (1905), but is much brighter vermilion in colour, and the 2 white spots on the forewings are smaller and rounder.

Length of forewing 19 mm., expanse 43 mm.

2 ♂♂, Las Quiguas, San Esteban (S. M. Klages coll.).

17. **Hyperthaema pulchra** sp. nov.

♂. This is, I consider, the finest of the *Hyperthaema*.

Pectus scarlet; legs umber-brown; first tarsal joint with exception of the tip in fore- and middle legs white on the outside; antennae brown; head and patagia orange-scarlet; tegulae and thorax crimson-scarlet; abdomen flame-orange clothed in basal half with scarlet-pink hair. Forewings brilliant crimson-scarlet, the two white patches characteristic of the genus extra large, the one below vein 2 shaped like a blunt arrow-head, the one beyond the cell being quadrate, narrowing distad. Hindwings semivitreous white tinged with rose, a broad blackish-brown outer margin running into the white in irregular patches and streaks.

Length of forewing 22 mm., expanse 50 mm.

1 ♂, Monte Tolima, Columbia, 3,200 m. = 10,400 ft., Feb. 1910 (A. H. Fassl coll.).

18. **Hyperthema sordida** sp. nov.

♂. Nearest to *H. hoffmannsi* Rothsch. (1909), but differs in the greater extent of white on the tarsus of front and middle pair of legs, the orange head, the rufous-chocolate forewings and thorax, the salmon-coloured abdomen with last 2 segments orange, and the reduced area of semivitreous white on hindwing.

Length of forewing 15 mm., expanse 34 mm.

1 ♂, Hansa Humboldt, Sta. Catharina, Sept. 1932 (A. Maller coll.).

19. **Baritius hampsoni flava** subsp. nov.

This subspecies of *B. hampsoni* Dogn. (1902) has the last 3 segments of the abdomen yellow, not red.

Juan Vinas, Costa Rica (W. Schaus coll.).

20. **Elysius flavoabdominalis** sp. nov.

♂♀. Similar to *E. disciplaga* Walk. (1856), but lacks the sooty patch on the abdomen.

Pectus sooty brown-black, rest of underside of head and body and legs sooty brown-black, basal half of coxae of forelegs yellow; head and thorax above more rusty, less greyish brown than in *disciplaga*; abdomen entirely golden yellow, a dorsal and a lateral line of black spots.

Forewings more rufous-brown than in *disciplaga*, the pale strigillations more numerous and less defined.

Hindwings white, slightly semivitreous and tinted a little with rusty brown, fringe and abdominal area rusty grey-brown.

♀. Similar, but hindwing more strongly washed with brown.

Length of forewing ♂ 23 mm., expanse 50 mm.

Length of forewing ♀ 26 mm., expanse 60 mm.

4 ♂♂, 2 ♀♀, Alto da Serra, São Paulo, March–Sept. 1927–1929 (R. Spitz coll.).

21. **Elysius disciplaga distincta** subsp. nov.

♀. Similar to *E. d. disciplaga* Walk. (1856), but differs in the abdomen above being deep orange, not yellow, in thorax and forewings being darker and brighter brown, in the patagia having the brown colour mixed with orange and the strigillation of the forewings being much stronger and more sharply defined. In the hindwings on the disc are a number of semivitreous pale patches.

Alto da Serra, São Paulo, March 1929 (R. Spitz coll.).

22. **Elysius superba intensa** subsp. nov.

♂♀. Much more intense rosy brown than *E. s. superba* Druce (1884).

2 ♂♂, 3 ♀♀, Alto da Serra, São Paulo, Feb.–March 1932–1933 (R. Spitz. coll.).

6 ♂♂, 13 ♀♀, Jaragua do Sul, Sta. Catharina, Sept. 1932 (F. Hoffmann coll.).

Type from Alto da Serra.

23. **Ischnocampa affinis** sp. nov.

♂. Allied to *I. tolimensis* Rothsch. (1916), and *I. hemihyala* Hamps. (1909), but quite distinct.

Differs from *tolimensis* in being larger, in lacking the subapical blackish patch on forewing and in being greyish sandy colour where *tolimensis* is dark brown. The spot in the cells is absent.

Length of forewing *tolimensis* 18 mm., expanse 40 mm.

Length of forewing *affinis* 23 mm., expanse 50 mm.

1 ♂, Monte Tolima, Columbia, 3,200 m. = 10,400 ft., Jan. 1910 (A. H. Fassl coll.).

Sir George Hampson has treated my *tolimensis* as a synonym of his *hemihyala*, but it is quite distinct and has the genitalia different.

Pseudischnocampa gen. nov.

Differs from *Ischnocampa* Feld. (1874) in its thick, heavy and very hairy body, in vein 3 of the forewing arising far behind angle of cell, not directly from it, and in the antennae of the ♂ being pectinated to the tip. Genotype : a species identified as *Ischnocampa nigrivena* Schaus (1901). Contains also *Ischnocampa nigridorsata* Schaus (1901) and *ecuadorensis* Rothsch. (1933).

24. **Pseudischnocampa nigridorsata albidior** subsp. nov.

♂. Differs from *P. n. nigridorsata* in being much whiter and in the first joint of the palpi being yellow.

6 ♂♂, 1 ♀, Tucuman, 1,100 m. = 3,575 ft., Jan.–Feb. 1895 ; 2 ♂♂, Siambon, Tucuman, 1,600 m. = 5,200 ft., Feb. 1933 (R. Schreiter coll.).

25. **Paronerita klagesi salmonea** subsp. nov.

♂. Differs from *klagesi klagesi* Rothsch. (1909) in the band uniting the subapical patch of the forewings to the oblique dark basal half of these wings being strongly reduced and almost obsolete and in having the hindwings rosy salmon colour, not yellow.

Tumatumari, British Guiana, Dec. 1907 (S. M. Klages coll.).

26. **Paranerita rosacea** sp. nov.

♂. Pectus and legs dirty white; antennae grey-brown; head and thorax purplish or violet-grey; abdomen crimson-scarlet. Forewing purplish or violet-grey on basal oblique half, the large scent organ showing through from below, a scarlet band above and along basal half of inner margin, outer half obliquely semivitreous cream-buff, a large apical patch purplish or violet-grey, costa between apical patch and basal half of wing yellow and also outer margin from apex to vein 4.

Length of forewing 14 mm., expanse 32 mm.

2 ♂♂, Pará (A. Miles Moss coll.).

Since describing *Neritos ockendeni coccinea* in *Ann. Mag. N.H.* (9) ix. p. 469, no. 59 (1922), from Pará, I find the name *coccinea* is preoccupied and also that the insect is a species distinct from *ockendeni*, therefore I rename it **N. coccineata** nom. nov.

27. **Neritos pectinata** sp. nov.

♂. Pectus white, hind- and middle legs white, innerside of forelegs brick red, antennae rufous-brown, outer $\frac{1}{3}$ whitish, basal $\frac{2}{3}$ heavily pectinated, outer $\frac{1}{3}$ with very short pectinations; vertex yellow, rest of head and thorax dull yellow, heavily suffused with carmine; abdomen carmine suffused with grey.

Forewing and basal half obliquely concave on outer side, rose tinged with rufous and edged outwardly and at costa with chocolate-brown, a yellow dot on vein; outer half semivitreous yellow, a large irregular apical patch brownish pink edged with dark brown. Hindwings semivitreous creamy white.

♀. Antennae serrated, brown, rest of body as in ♂. Forewings brownish purple suffused with scarlet, a scarlet ring round yellow dot on vein 1, a large wedge-shaped yellow patch edged with scarlet running in from costa and edged with scarlet, a broad yellow margin from apex to vein 2 edged inwardly with scarlet. Hindwings semivitreous yellowish buff.

Length of forewing ♂ 14 mm., ♀ 15 mm., expanse ♂ 31 mm., ♀ 34 mm.

2 ♂♂, 5 ♀♀, Tutoya, North-East Brazil (A. M. Moss coll.).

28. **Hypidalia** (?) **luteoalba** sp. nov.

♂. Forelegs and pectus carmine pink; forehead and vertex orange; thorax, abdomen and middle and hindlegs white.

Forewings cream-white. Hindwings semivitreous white.

Length of forewing 14 mm., expanse 31 mm.

1 ♂, Matto Grosso, Dec. 1929 (R. Spitz coll.).

29. **Hypidalia sanguirena rubrivena** subsp. nov.

♀. Differs from *H. s. sanguirena* Schaus (1905) in having the veins of the forewings on the outer half reaching to termen red, not black.

1 ♀, Maranhão, N.E. Brazil (Miss Orchard coll.).

30. **Opharus nigrocinctus** sp. nov.

♂♀. Pectus and legs sooty brown; vertex brown-white; antennae pale wood-brown, pectinated in ♂, filiform in ♀; thorax greyish wood-brown; abdomen yellow ringed with black bands.

Forewings yellowish wood-brown, a lunate darker patch on discocellulars. Hindwings semivitreous whitish grey-brown, darker towards margins.

Length of forewing ♂ 20 mm., ♀ 24½ mm., expanse ♂ 45 mm., ♀ 54 mm.

1 ♂ (type), 1 ♀, Rio Grande do Sul; 1 ♀, Jaragua do Sul, Sta. Catharina, June 1926 (F. Hoffmann coll.).

31. **Hemihyalia fuscoides** sp. nov.

♂. Differs from *H. fusca* Rothsch. (1909) in its much smaller size, darker brown head and thorax, and in the anal and two praeanal segments of the abdomen being black.

Length of forewing *fuscoides* 27½ mm., expanse 62 mm.

Length of forewing *fusca* 32 mm., expanse 73 mm.

3 ♂♂ (type), Agualani, Carabaya, S.E. Peru, 9,000 ft., July 1905; 1 ♂, Rio Huacamayo, Carabaya, 3,100 ft., dry season, June 1904 (G. Ockenden coll.).

32. **Hemihyalea schausi** sp. nov.

♂♀. Differs from *H. mansueta* Hy. Edwards (1884) in the thicker scaling and total absence of any marking on the golden brown-buff forewings and greater extent of rosy flush on the hindwings.

2 ♂♂, 2 ♀♀, Juan Vinas, Costa Rica (W. Schaus coll.).

33. **Hemihyalea splendens griseiventris** sp. nov.

♂♀. Differs from *H. s. splendens* Barnes (1910) in the irregular bands of the forewings being much sharper defined, in the abdomen of most specimens being greyish white with outer half darker; in the 20 specimens before me there are 6 which have a slight rose tint to the abdomen, but in none is the abdomen wholly rose as in *s. splendens*.

15 ♂♂, 5 ♀♀, Davis Mts., Fort Davis, Texas, 5,000 ft., July 1928 (Poling coll.).

34. **Amastus roseicorpus** sp. nov.

♀. Nearest to *A. minerva* Dogn. (1891), but at once distinguished by the deep rose-coloured abdomen and the browner colour of the wings, all markings being much less distinct.

Length of forewing 32 mm., expanse 71 mm.

1 ♀, Venezuela.

35. **Amastus brunnescens** sp. nov.

♀. Pectus and legs dirty chocolate-brown; head and thorax rusty chocolate-brown; abdomen rufous wood-brown with a yellowish tinge.

Forewings bright rufous-chocolate with an ill-defined dusky spot at apex of cell, a somewhat obsolete serpentine chocolate-buff transverse band just beyond cell and an antemarginal more defined chocolate-buff sinuate transverse band. Hindwings semivitreous yellowish pale chocolate-rufous.

Length of forewing 32 mm., expanse 74 mm.

1 ♀, Dominica (Penrice coll.).

36. **Amastus bipartitus** sp. nov.

♂. Legs deep chocolate-brown; pectus dull red; head and thorax deep rufous chocolate-brown; antennae strongly pectinate, rufous-brown; abdomen salmon-orange with obsolete black spots on 3 praeanal segments.

Forewings blackish chocolate-brown, a paler obsolete transverse submarginal band. Hindwings semivitreous creamy buff, salmon-pink at base.

Length of forewing 32 mm., expanse 73 mm.

1 ♂, Uruhuasi, S. Peru, 7,000 ft., March–April 1910 (H. and C. Watkins coll.).

37. **Amastus chimaera** sp. nov.

♀. Pectus sooty grey-black; legs sooty brown; head and patagia sooty grey-brown; antennae wood-brown, pectinate in ♂, serrate in ♀; tegulae pinkish mauve-grey with central black stripe; thorax black; abdomen yellow on first and last 3 segments, rest dorsally sooty black, sides of abdomen yellow, a broad lateral stripe and segmental bands and spots black. Forewing pinkish mauve-grey, semivitreous, strongly strigillated and speckled with yellowish wood-grey, a black patch ill-defined at apex of cell, costo-subcostal area and cell for $\frac{2}{3}$ of its length brown speckled with grey, the area below vein 1 black for $\frac{3}{4}$ of its length, with yellow mixed in basal $\frac{1}{4}$. Hindwings semivitreous wood-grey, tornal and abdominal area darker. ♂ differs in having no central black streak to the tegulae and in having a postmedian transverse whitish band from costa to vein 4.

Length of forewing ♂ 30 mm., ♀ 37 mm., expanse ♂ 67 mm., ♀ 83 mm.

1 ♀ (type), Jaragua do Sul, Sta. Catharina, Sept. 1932 (F.Hoffmann coll.); 1 ♂, New Granada (= Colombia) (Felder coll.).

38. **Halisidota albinucha** sp. nov.

♂. Differs from *H. albiceps* Rothsch. (1933) in the absence of the white on the head and tegulae, in the white patagia and in the more elongated forewings.

Length of forewing 24 mm., expanse 54 mm.

Alto da Serra, São Paulo, Feb. 1925 (R. Spitz coll.).

39. **Spilosoma melaenoides** sp. nov.

♂. Differs from *S. melaena* Hamps. (1901) in the shorter antennae with much shorter pectinations and darker shaft being deep brown, NOT golden brown; in the tegulae being on the lower half dull yellow, NOT entirely black; fore- and midcoxae and outer part of fore- and midtibiae dull yellow. The white lines of the forewings vary much and in the same way as in *melaena*. Hindwings pure milk white in all of the 16 specimens with dark markings, varying from a band of sooty black patches across the wings from tornus to termen and a black spot below costa to a black spot at tornus, two black dots at vein 1 and a black spot

below costa. The white marginal line of the forewing of *melaena* is absent and the fringe is pure white, not black. *S. melaenoides* is smaller than *melaena*.

Length of forewing *melaenoides* 20 mm., expanse 45 mm.

Length of forewing *melaena* 23 mm., expanse 52 mm.

17 ♂♂, Kletak, Tengger, E. Java, 6,000 ft., May 1934 (J. P. A. Kalis coll.).

40. **Acantharctia flavimarginata** sp. nov.

♂. Legs buffish yellow, inside sooty grey; antennae sooty grey with paler shaft; head, patagia and tegulae golden yellow; thorax cream-buff; abdomen yellow ringed with black.

Wings with satiny sheen cream-buff, fringes, costa and inner margins golden yellow; forewings with two bands of sooty grey, one from base through cell and 2nd along median vein almost to costa. Six out of 9 ♂♂ are similar to the type, but 3 have the sooty bands much enlarged so that one example appears to have sooty-grey forewings, buff nervures and yellow margins; this form I propose to call ab. *suffusa* ab. nov.

9 ♂♂, Suna, S. Kavirondo, March 1932 (W. Feather coll.).

41. **Acantharctia tenebrosa** sp. nov.

♀. Pectus sooty black; legs orange, inside and coxae sooty black; head orange; antennae filiform, black; thorax sooty black sprinkled with dull orange hairs; abdomen black, with narrow orange rings. Forewings sooty black margined with orange.

Hindwings sooty black, margined with orange expanding widely at tornus and with 2 or 3 irregular projections into the dark area of the wing. In 2 of the 3 ♀♀ the orange on hindwing is strongly expanded, 1 having the whole wing orange except two costo-apical dark patches; this I propose to call ab. *aurantiaca* ab. nov.

Length of forewing 18½ mm., expanse 41 mm.

Suna, S. Kavirondo, Nov. Dec. 1931 (W. Feather coll.). This may be the ♀ of *flavimarginata*, No. 40 above.

42. **Acantharctia nigrivena** sp. nov.

♂♀. Pectus sooty grey; legs in ♂ whitish outside, orange inside, in ♀ dark grey outside, orange inside; antennae black; head and thorax white; abdomen yellow above with central dorsal black spots, white below.

Forewings white with black nervures thickening into a black dot at termen and thicker black on discocellulars. Hindwing white, nervures thinly black towards outer margin.

Length of forewing ♂ 17 mm., ♀ 22 mm., expanse ♂ 38 mm., ♀ 50 mm.

Kibwezi, Kenya, Dec. 1916–1928 (W. Feather coll.).

43. **Creatonotus medioflavus** sp. nov.

♀. Pectus crimson; legs reddish brown; frons brown; collar and patagia red; thorax too rubbed to describe; abdomen dark crimson; median line of spots and anal segment black.

Forewing black, an oblique postmedian band from subcostal nervure to vein 2 white. Hindwing yellow, with broad black border, vein and anal area orange.

Length of forewing 19½ mm., expanse 44 mm.

Gambaga, Gold Coast (Dr. Bury coll.).

44. **Creatonotus affinis** sp. nov.

♀. Differs from *C. dulla* Pagenst. (1886) and its subspecies by the more irregular inside edge of the oblique median yellow band of the forewings, by the yellow, NOT black, head, and by the apical portion of abdomen being on the underside much more extended yellow, $\frac{3}{5}$ instead of $\frac{1}{4}$.

Length of forewing 25 mm., expanse 55 mm.

2 ♀♀, Humboldt Bay, Dutch New Guinea, Sept.–Oct. 1892 (W. Doherty coll.).

45. **Pericallia rudis albidior** subsp. nov.

♀. Differs from *P. rudis rudis* Walk. (1874) in having the head white, not black; in having the tegulae white and unspotted; in the dark spots on the hind thorax being much reduced; in the ground-colour of the forewings being white, not deep brown, and the brown reduced to irregular transverse bands, the brown being also much paler, and in the hindwings being paler, more yellowish crimson.

1 ♀, Oleasers, Saparoea, Moluccas, Jan. 1892 (Martin coll.).

46. **Arachnis tristis** sp. nov.

♂. Pectus, head and thorax sooty grey, sides of pectus crimson; legs dark grey; abdomen sooty black, a lateral band of pale rosy spots diminishing distad.

Forewings sooty grey with nervures blackish, and with black intranervular streaks in outer ¼ of wing.

Hindwings black, costal ⅓ sooty grey. Below both wings have their bases crimson.

Length of forewing 22 mm., expanse 49 mm.

Zacualpan, Mexico.

47. **Euchaetias bicolor** sp. nov.

♀. Pectus and forecoxae crimson; legs sooty brown; head black, collar crimson; antennae black; thorax and 1st abdominal segment black, rest of abdomen crimson.

Fore- and hindwings sooty black, nervures sooty grey.

Length of forewing 16 mm., expanse 36 mm.

2 ♀♀, Alto da Serra, São Paulo, Nov. 1928 (R. Spitz coll.).

48. **Turuptiana ecpantherioides** sp. nov.

♂. Nearest to *T. tessellata* Druce (1906).

Pectus black; legs black- and white-banded, hind part tawny orange, underside of thorax and abdomen white, centre of underside of thorax tawny orange; frons and antennae black, vertex creamy white; upperside of thorax cream-white, with a black pair of spots, patagia with black central spot, tegulae

with central black band ; abdomen golden buff, a broad dorsal black band from segment 2 to anal tuft, low lateral vertical black streaks.

Forewing creamy white with nervures golden, costal area with 5 more or less quadrate black patches divided by the gold veins, 5 irregular serpentine transverse bands divided into spots by the golden nervures, the central band being much the widest.

Hindwing cream-white, nervures and abdominal area pale yellow.

Length of forewing 23 mm., expanse 51 mm.

1 ♂, Chiriqui, Panama.

49. **Turuptiana pertestacea** sp. nov.

♂. Nearest to *T. testacea* Rothsch. (1909), but larger.

Legs, pectus and antennae black ; rest of insect testaceous cream-buff, except abdomen, which is yellow.

The two darker spots on costa and on inner marginal area of forewing which are present in *testacea* and *turuptianoides* are barely indicated as shadows.

Length of forewing *testacea* 19 mm., expanse 42 mm.

Length of forewing *pertestacea* 22 mm., expanse 50 mm.

2 ♂♂, La Union, R. Huacamayo, Carabaya, S.E. Peru, 2,000 ft., wet seas., Dec. 1904 (G. Ockenden coll.), type ; 3 ♂♂, R. Huacamayo, 3,100 ft., dry seas., June 1904 (G. Ockenden coll.).

50. **Phryganoptera postexcisa** sp. nov.

This extraordinary species is even more striking than *Paraphrygia rectangulata* Kenrick (1913).

♂. Legs, pectus and frons brownish wood-grey ; vertex grey with 3 black and 2 red spots ; patagia, tegulae and thorax grey, spotted with black and bearing 2 minute red spots ; abdomen scarlet, with some obsolete minute black dorsal dots, basal segment clothed with long brown hair, anal segment yellow, with dorsal black spot.

Forewing, basal $\frac{2}{5}$ grey suffused with brown, outer $\frac{2}{5}$ whitish grey, 2 subbasal and 3 cellular black dots, on the basal $\frac{3}{5}$ are 3 indistinct serpentine brownish shadow bands, nervures dark brown, a row of brown marginal dots.

Hindwing strongly excised, the anterior half projecting far beyond the posterior half, anterior half divided longitudinally, costal section being wood-grey, inner section deep wood-brown bordered inwardly with golden yellow, the posterior half golden yellow-brown at base ; the whole of this posterior half of the hindwing forms one large scent organ, being covered with hairy androconial scales.

On the underside of forewing $\frac{2}{3}$ of the wing is occupied by a huge scent organ consisting of black androconial scales.

Length of forewing 22 mm., expanse 49 mm.

3 ♂♂, Station Perinet, 149 km. east of Tananarivo, Dec. 1922 (Mme N. d'Olsoufieff coll.). In one specimen of the 3 the brown of the base almost obscures the whole of the yellow of the posterior $\frac{1}{2}$ of the hindwing. In the same collection were examples of *Ph. perenoti* Rothsch. (1933) and the hitherto unknown ♀ of *Paraphrygia rectangulata* Kenrick (1913).

51. **Baroa javanica** sp. nov.

♂. Very similar to *B. siamica* Hamps. (1911), but the hindwing is not excised as in that species and the produced tornal lappet is larger, more curved and covered with whitish androconia, whereas in *siamica* this tornal lappet is entirely deep black. The yellow on the thorax is more extended backwards than in *siamica*. ♀ similar.

Length of forewing 17½ mm., expanse 35 mm.

9 ♂♂, 10 ♀♀, Djoenggo Arjuno, E. Java, 4,500 ft., May 1934; Singulangoe, Tengger Mts., 5,000 ft., April 1934 (J. P. A. Kalis coll.).

TWO NEW SUBSPECIES OF MAMMALS FROM ANGOLA.

By JANE ST. LEGER, F.Z.S.

THE two mammals here described were collected by Dr. Karl Jordan on his expedition to Angola in 1934. A list of the mammals obtained will be published at a later date.

1. **Anomalurus jacksoni jordani** subsp. nov.

Female No. 116 (Type) Fazenda Congulu. Two males and 1 female, Posto Quirimbo, 75 km. east of Amboim.

A squirrel of the *jacksoni*-group, larger in size and darker in colour than the typical race.

General colour very dark grey. Base of dorsal fur dusky neutral grey (Ridgway, pl. LIII), tips pale smoke grey (pl. XLVI). Face paler than body, but not so conspicuously so as in *A. j. jacksoni* De Winton (1898). The base of the facial and throat fur paler than that of the dorsal surface, between neutral grey and deep neutral grey (p. LIII). Colour of the stiff bristle hairs edging the anterior portion of the flying membrane deep black. Back of hands black ; backs of feet body colour with black bristle hairs over the claws. Ventral surface greyish white strongly washed buffy ; the base of the fur deep neutral grey (p. LIII), much darker than in the typical race in which the base of the fur is white or white faintly tinged grey ; tips cartridge buff (pl. XXX), deepening to pinkish buff (pl. XXIX) along the mid-ventral surface. Tail more bushy than in *A. j. jacksoni*. Colour of the proximal portion of the tail to the point beneath which the scales end, the same as that of the body ; distal portion of the tail black.

Type : Adult female (B.M. No. 35.1.6.80) from Fazenda Congulu, Amboim district, Angola, alt. 700–800 m.

Head and Body : 345. Tail, 290. Hindfoot, 66. Ear, 39.

Skull : Condylo-incisive length, 56·8 ; zygomatic width, 40·4 ; mastoid width, 26 ; interorbital width, 16·2 ; alveolar length of upper molar series, 12·9 ; least width of palate (between premolars), 2·6 ; greatest width of palate (between posterior molars), 6·5.

The series obtained by Dr. Jordan consists of four specimens, of which one female was captured at Fazenda Congulu, the remaining three, two males and one female, at a short distance below Congulu at Posto Quirimbo, 75 km. east of Porto Amboim. Of these three skins, two exactly resemble the type in colour, the remaining skin, that of the female, is browner in dorsal coloration. This appearance is due to the colour of the tips of the hairs, of which some are drab (pl. XLVI) rather than grey. This browner coloration cannot be due to seasonal change, as this skin was obtained on May 6th, whilst the other two skins from Quirimbo were obtained on May 4th and May 11th respectively, and the skin chosen as the type from Fazenda Congulu on April 25th.

From its nearest congener *A. jacksoni perustus* of R. Lubefu, 75 miles north of Lusambo, Congo, *A. jacksoni jordani* differs in its larger size, darker colouring and yellow-washed ventral surface, as well as in the colour of the base of the

ventral fur, which is deep grey, whilst in *A. j. perustus* the base of the ventral fur is white, or white faintly tinged with grey as in the typical race.

2. **Heliosciurus rufobrachiatus brauni** subsp. nov.

This squirrel is immediately distinguished amongst the squirrels of the *rufobrachiatus*-group by the brilliant tawny colouring of the ventral surface. I name it after Mr. Rudolf Braun, who was Dr. Jordan's companion in Angola and assisted him in the collecting and skinning of the mammals.

Colour of dorsal surface as usual, speckled black, ochraceous and light buffy, the hair base being black. Tail lighter in colour than the body, tawny, each hair with three black rings and a broad white tip. Outer surface of forearms lighter than the dorsum ; hands ochraceous buff. Outer surface of legs body colour ; feet same colour as the hands, but with the median portion speckled with black. Whole of undersurface, including the inner sides of the arms and legs, ochraceous tawny (Ridgway, pl. XV).

Type : Adult female (B.M. No. 35.1.6.87) from Fazenda Congulu, Amboim district, Angola, alt. 800 m.

Head and Body : 218. Tail, 225. Hindfoot, 53. Ear, 19.

Skull : Condylo-incisive length, 47 ; zygomatic width, 29·5 ; interorbital width, 16·3 ; mastoid width, 21·7 ; alveolar length, upper molar series, 9·4.

The squirrels of the *rufobrachiatus*-group show considerable individual variation in ventral colouring within the same subspecies, and this series, all of which were obtained in the forest below the Fazenda Congulu, and on dates between April 10th and 21st, forms no exception to the rule. Of the six squirrels of the series, two females exactly resemble the type in ventral coloration, the hairs being brilliant tawny throughout, or with only a few hairs showing a narrow scarcely perceptible darkening of the base. Of the remaining three skins, two, a male and a female, show darkening of the ventral surface due to the lengthening of the dark-grey hair base, which in the male specimen is about one-third of the total length of the hair. In the remaining squirrel, a female, the ventral colouring shows a stage intermediate between that of these two and the type.

ADDITION TO A CHECK-LIST OF THE ORDER PROCELLARIIFORMES.

By GREGORY M. MATHEWS.

In Novitates Zoologicae, xxxix, December 1934, I gave Keys of the different forms, in some cases to the subspecies; I now add those subspecies not included before. Some corrections are also necessary, as follows:

P. 158, Admit *Macronectes giganteus halli* Mathews 1912.

Distr. Indian Ocean (West Australia).

Breeding: Kerguelen, Prince Edward and Crozet Islands.

P. 153, line 10, read *empomohora*, not *empomophora*.

P. 153, line 40, read 1820, not 1920.

P. 153, line 44, read Swinhoe, not Swinhow.

P. 158, line 25, read 1758, not 1785.

P. 161, line 2, read 394, not 384.

Pp. 162 and 192, read Moquin, not Monquin.

P. 166, line 23, add "p. 51"; line 45, read 1928, not 1929.

P. 167, under *P. feae*, put "*Ann. Mus. Civ. Gen.*," first, as a reprint, sent to Dr. Otto Finsch from the Author, is dated "Dec. 27th, 1899."

P. 168, line 4, read Eastern for Western Pacific.

P. 171, put "Subfamily *Pachyptilinae* Dove Prions" down to just above "Genus *Pachyptila* Illiger."

P. 171, last line read Manuel, not Manual.

P. 172, add as synonym of *vittata*,

"*Prion australis* Potts, *Ibis*, 1873, p. 85, Jan. New Zealand."

P. 172, last line but one read 1933, not 1833.

P. 175, read *Heteroprion belcheri solanderi* Mathews 1912.

The type is from the extreme South of Chile, and the breeding-place is Falkland Islands.

P. 177, read *kuhlii* all through.

P. 180, last line but one read 1820, not 1920.

P. 183, add as synonym of *byroni*,

"*Cinathisma cheimeria* Hull, *Emu*, vol. xv, p. 4, p. 211, April 1st, 1916, alternative name for *cyaneoleuca*."

P. 185, change "and Wollaston Island, 15 miles north of Cape Horn," to next subspecies.

P. 186, line 37, put "McKeans, Willis, and Borabora" under the typical subspecies.

P. 187, line 39 read 1853, not 1852.

P. 189, to the distribution of *kaedingi* add "New Zealand, Accidental, one occurence."

P. 190, line 29, read Sagami, not Sangmi.

P. 193, line 13, add "*Nat.*," and read *Sci. Nat.*

P. 197, line 32, read Peruvia.

P. 198, line 24, read *Procellaria*.

P. 198, add as indeterminable *Procellaria gavia* Forster, from p. 183.

Bulweria / Procellaria

- a Bill ... Pacific Ocean — *Procellaria* Lesson 1825
- b Bill ... Atlantic Ocean — *Bulweria* Math 1934

Pterodroma

- a Dorsum ...
  - 1 Bill ... — *Pterodroma* Lesson 1826
  - 2 Bill ... — *Aestrelata* Salvin 1896
- a' Dorsum ...
  - Dusky-brown — *Pterodroma* Mathews 1913
  - Ash-brown — *Cookilaria* Math 1912

Halobaena / Pachyptila

- a Indian and Atlantic Ocean. Larger. Wing average 117 mm; Culmen 37.8 mm. — *Halobaena* Temm 1828
- a' Pacific Ocean. Smaller. Wing average 112 mm; Culmen 32 mm.
  - 1 Western Pacific, breeding on Auckland, Campbell and Bounty Islands — *Pterodroma* Math 1912
  - 2 Eastern Pacific, breeding on Juan Fernandez Islands — *Pterodroma* Math 1912

Pseudoalca / Daption

- a Chin, throat and neck ... Usually
  - a' Entire crown, nape, scapulars, back, wing and tail coverts dark slaty-black — *Pseudoalca* Math 1912
  - b' Crown, nape, scapulars, back, wing and tail coverts white, or white with dark markings
    - 1 Wing over 400 mm. Bill ... — *Daption* Leach 1818
    - 2 Wing under 400 mm
      - a Bill yellowish — *Procellaria* Murphy 1930
      - b Bill black or grey
        - a Culmen concave, bluish-horn — *Procellaria* Gould 1841
        - b Culmen straight, yellow
          - 1 Rami pale yellow — *Procellaria* Bonnaterre 1792
          - 2 Rami dark-yellow — *Procellaria* Math. 1903
  - b' Chin, throat and neck ... Usually
    - a Lateral rectrices dark, transverse bar at base of lower mandible soft, bluish-black — *Thalassoica* Reichenow 1914
    - b Lateral rectrices white, or white with dark markings
      - 1 Pacific and Indian Oceans. Culmen 103-124 mm (110.5); Tarsus 79-89 mm (84.5)
        - a Indian Ocean, breeding on Kerguelen, Marion and the Crozet Islands — *Fulmarella* Forster 1785
        - b Pacific Ocean, breeding on Campbell Island — *Fulmarella* Bonaparte 1856
      - 2 Atlantic Ocean. Culmen 107-120 mm (114.5); Tarsus 88-92 mm (89.7) — *Fulmarella* Bonaparte Salvadori 1911
  - c' Chin, throat, pectoral bands, transverse bar at base of lower mandible black — *Nealbatrus* Math 1912
    - a' Top of head white, sides of face, nape and hind neck distinctly washed with grey — *Nealbatrus* Bonaparte 1856
    - b' Head and neck white — *Nealbatrus* Math 1912

Thalassoica / pelagica

- a Upper and under surfaces dark brownish-grey. Head or lower mandible uniform sooty-black. Indian Ocean — *Procellaria pelagica* Forster 1785
- a' Upper and under surfaces black and white
  - b Dorsum, remainder of head or lower mandible, Blue Pacific Ocean — *Procellaria hasitata* Math 1912
  - b' Lighter and larger. Lores, orbit tinged with pale brown. South Atlantic Ocean — *Procellaria marchei* Math & Ir 1921

Thalassoica / Pachyptila

- a' Bill over 130 mm in length, and equal to or longer than the middle toe and claw
  - a Underside of wing, for a considerable distance, like the upper surface. Bill compressed at the base, ... culmen less than 40 mm, longer than the tail — *Procellaria arctata*
  - a' Underside of wing uniform white, like the upper surface. Bill not compressed at the base, ... culmen more than 40 mm, shorter than the tail — *Procellaria albatrus*
- b' Bill less than 130 mm in length, and scarcely better than the middle toe and claw, and much shorter than the tail
  - a Colour sooty-black, more or less mottled with white; culmen not shorter than the middle toe and claw — *Procellaria impexa*
  - a' Colour dark above, white below; culmen a little less than the middle toe and claw — *Procellaria nemoralis*

Remove *Halobaena caerulea* from the *Prion* section in Key one and add to Key three.

V. Hind-claw small; plumage of upper parts not white ... culmen more than half as long as the middle toe and claw

- a' Tail square or slightly wedge-shaped, not graduated, and rounded — *Halobaena caerulea*
- a Tail graduated, and wedge-shaped — *Cookilaria, Pterodroma,* and *Bulweria*

(Tail less than half the length of the wing in *Halobaena, Cookilaria,* and *Pterodroma.*)

Majaqueus / aequinoctialis

- b' Bill average over 100 mm ... Culmen 48-58 mm (Indian Ocean) — *Majaqueus* Math 1912
- b Bill average under 100 mm
  - a Smaller, 90 mm (Atlantic Ocean) — *Majaqueus aequinoctialis* Gm 1789
  - a' Larger, 93 mm (Pacific Ocean) — *Majaqueus whitleyi* Potts 1874

(The Austro-New Zealand race is intermediate between *aequinoctialis* and *hulli*)

Pachyptila / desolata

- a Width of mandible at base 16.4 mm or over
  - a' Darker coloured above ... Pacific Ocean; breeding New Zealand — *Procellaria desolata* Forster 1777
  - a' Lighter coloured above ... Atlantic Ocean; breeding Gough Island — *Procellaria turtur* Math 1912
- a' Width of mandible at base 16 mm or under
  - a' Width at base between ... exposed culmen 21 mm — *Procellaria macgillivrayi* Math 1912
  - a' Width at base under 16 mm
    - a Width at base 13-14 mm ... culmen 20-22 mm. Indian Ocean, breeding Marion and Crozet Islands — *Procellaria salvini* Math 1912
    - a' Width at base 13 mm or under ... culmen 24 mm. Pacific Ocean, breeding Australasian Islands — *Procellaria globicola* Math 1912

P. salvini from Otaslea, West Australia, Aug. 1949.)

P. macgillivrayi intermediate between *desolata* and *globicola* in bill measurement

Puffinus gravis

- Bill larger [illegible]
- Bill smaller
  - Wing 226 mm. or over. Smaller Island
  - Wing 211–224 mm. Upper Island, Lesser Antilles

Puffinus griseus

- Bill larger
- Bill smaller

Puffinus puffinus

- Bill longer. Western Pacific Ocean, breeding New Zealand
- Bill shorter
  - Eastern Pacific Ocean, breeding Galapagos Islands
  - South Atlantic Ocean, breeding Falkland Islands

Puffinus lherminieri

- Bill larger
- Bill smaller
  - Bill rose or flesh colored
  - Bill yellowish to pinkish

Oceanodroma castro

- Atlantic Ocean. Wing 144–157 mm., average 149
- Atlantic Ocean. Wing 157–162 mm., average 160
- Pacific Ocean. Wing 147–160 mm. (average 157). Tail shorter
- Pacific Ocean. Wing 156 mm. Tail deeper forked

Oceanodroma melania

- Wing 167–186 mm., average 177
- Wing 180–189 mm., average 184

Oceanodroma leucorhoa

- Wing average over 150 mm. Wing, male 142 mm., female 135.5 mm.
- Wing average under 150 mm.
  - Wing, male, 144.8 mm.; female 147.6 mm.
  - Wing, male 140.4 mm.; female 142.6 mm.

Oceanodroma macrodactyla

- Wing 148–166 mm., average 160
- Wing 143–164 mm., average 153.5

Fregetta grallaria

- Wing 130–145 mm., average 140
- Wing 124–135 mm., average 129

Oceanites oceanicus

- Wing smaller
- Wing larger

Oceanites gracilis

- Smaller, wing 127–140 mm., average under 130
- Larger, wing 131–147 mm., average 138

Garrodia nereis

- Wing average over 130 mm.; wing average 135 mm.
- Wing average under 130 mm.
  - Wing smaller, average 124 mm.
  - Wing larger, average 128 mm.

Pelagodroma marina

- Above light brown, not grey
- Above grey
  - With fine mouse shade
    - Bill shorter, darker colored above
    - Bill longer, lighter colored above
  - Without fine mouse shade

Pelecanoides urinatrix

- Jugulum not distinctly mottled with grey
- Larger, wing over 130 mm. in the males
- Smaller, wing under 130 mm. in the males
  - Mandibular ramus wider
  - Mandibular ramus narrower
    - Mottling on jugulum
    - No mottling on jugulum

- Jugulum distinctly and heavily mottled with deep neutral grey. Wing, male 122 mm.

Pelecanoides georgicus

- Wing longer, 112 mm., Indian Ocean
- Wing shorter, 107 mm., Pacific Ocean

The birds from New Zealand are smaller in the wing than birds from South Georgia

The type of *neglecta* in the Rothschild collection in New York

[redacted]

[illegible] Mus. [illegible]

[illegible] 1844

[illegible] Mus. 1911

[illegible] Mus. 1912

[illegible] 1913

Halocyptena Gould 1844

Halocyptena hollisi Math. 1912

Puffinus Lac. 1781

Puffinus diomedea Bp. 1857

Puffinus bryani Ridgway 1884

Puffinus puffinus Gr. 1789

Puffinus athenae Math. 1912

Puffinus hamiltoni Math. 1912

Puffinus assimilis baroli Lesson 1831

Oceanodroma castro Harcourt 1851

Oceanodroma helena Math. 1934

Oceanodroma cryptoleucura Ridgway 1887

Oceanodroma tethys Nich. 1914

Oceanodroma melania Bp. 1854

Oceanodroma markhami Kuroda 1922

Thalassidroma leucorhoa Vieill. 1818

Oceanodroma Reichenbach 1900

Thalassidroma Audubon 1898

Oceanodroma macrodactyla Saunders 1897

Oceanodroma cheimomnestes Townsend 1890

Fregetta Bp. 1857

Fregetta grallaria Gray 1845

Oceanites oceanicus Kuhl 1820

Oceanites oceanicus Math. 1912

Oceanites gracilis Elliot 1859

Oceanites subgracilis Lowe 1923

Garrodia nereis Math. 1912

Garrodia nereis Math. 1912

Garrodia nereis Gould 1841

Pelagodroma marina Math. 1910

Puffinus marmoratus Latham 1790

Puffinus bulleri Math. 1912

Puffinus kuhlii Math. 1912

Pelecanoides urinatrix Gm. 1789

Pelecanoides urinatrix Math. 1912

Pelecanoides urinatrix berard Quoy and [illegible] 1824

Pelecanoides dieffenbachi Nich. 1906

Pelecanoides urinatrix exsul Math. 1912

Pelecanoides georgicus M. & H.

Pelecanoides exsul subspec. nov.

Attagenodes ariasi

a Width of mandibular ramus at base 10 mm
(Pitcairn Islands to the West Australian coast)
a' Width of mandibular ramus at base 10–12 mm
b Bill stout, deep at base, nostril
a Larger South Atlantic Ocean, breeding Bouvet Island
a' Smaller Pacific Ocean, breeding New Zealand
b' Bill slender, nostril
a Larger South Atlantic Ocean, breeding Bouvet Island
a' Smaller Pacific Ocean, breeding Australia

Pseudopsaltriculus

c² Bill very deep throughout, depth at base 0.6× the head
f Bill heavy, mostly black
f' Bill slender and with proximal two-thirds of lower mandible horn-colour
e Bill medium, depth at base 0.5× the length
f Nail on bill short
f' Nail on bill heavier
g² Bill black and smooth
g³ Bill light and ridged

Halobaena caerulea Math 1912

Pachyptila vittata Math 1912

Pachyptila turtur Kuhl 1820
Pachyptila salvini Math 1912
Pachyptila crassirostris Math 1912
Pachyptila belcheri Math 1932

Halobaena belcheri

d¹. Width of mandibular ramus at base 8 mm
d² Width of mandibular ramus at base over 8 mm
e Width 9–10.5 mm, South Atlantic and Eastern Pacific Ocean
e' Width 11–12 mm, Indian Ocean

Halobaena belcheri Math 1912
Halobaena salvadorii Math 1912
Halobaena serventyi Math 1935

Pterodroma phaeopygia

j Bill larger, light edging to back feathers
j' Bill smaller, no light edging to back feathers

Pterodroma phaeopygia Salvin 1876
Pterodroma sandwichensis Ridgway 1884

Pterodroma mollis

b' Under-surface not all white
i Under-surface white with dark breast band
i' Under-surface uniform grey
h Under-surface all white
i' Wing 272–280 mm
i' Wing under 270 mm
j' Wing 260–267 mm, average 264
j² Wing 245–270 mm, average 247.5

Pterodroma mollis Gould 1844
Pterodroma deceptionis Math 1932
Pterodroma feae Salvad 1900
Pterodroma deserta Math 1934
Pterodroma madeira Math 1934

Pterodroma lessoni

b' Bill slender, tail more and more [illegible] shafts of tail feathers yellowish
[illegible] under-surface [illegible] white

Pterodroma lessonii Math 1916
Pterodroma lessoni Garnot 1826

Pterodroma rostrata

i' Bill 36–39 mm (average 37), slender
i² Bill 45–46 mm, heavier

Pterodroma rostrata Peale 1848
Pterodroma trinitatis Brasil 1917

Pterodroma heraldica

h Under tail-coverts white with black bars near the ends of the feathers
h² Under tail-coverts dark

Pterodroma heraldica Salvin 1888
Pterodroma paschae Loomb 1920

Pterodroma macroptera

j' Wings shorter, face not so grey
j² Wings longer, face grey
k Larger, Pacific Ocean, breeding on Islands off New Zealand
k' Smaller Indian Ocean, breeding Western Australia

Pterodroma macroptera Smith 1840
Pterodroma gouldi Hutton 1869
Pterodroma albigula Math 1912

Bulweria bulwerii

d¹. Wing 201–210 mm (average 205), Atlantic Ocean
d² Wing 190–204 mm (average 199), Pacific Ocean

Bulweria bulwerii J. & S. 1828
Bulweria fallax Mathews & I 1915

Procellaria aequinoctialis

b¹. White on chin and sides of the head
b². White on chin only
c¹ Larger,
d South Atlantic Ocean, breeding on Falkland Islands and South Georgia
d² South Indian Ocean, breeding on Crozets and Kerguelen Islands
c². Smaller, Pacific Ocean

Procellaria aequinoctialis L. 1758
Procellaria aterrima Math 1912
Procellaria steadi Math 1912

Puffinus puffinus

d¹. Upper parts sooty black or blackish brown; axillaries white with or without a dark subterminal band and tipped with white
e¹ Under tail coverts wholly or almost entirely white, sides of neck not heavily scalloped
e² Under tail coverts mostly dark, sides of neck heavily scalloped
[*assimilis* Henshaw 1900, differs from *gavia* in having the vent white and a sharp line of demarcation on the side of the neck between the dark of the upper and white of the lower side].
d² Upper parts brownish

Puffinus puffinus Brünn 1764
Puffinus gavia Townsend 1890

Puffinus mauretanicus Lowe 1921, and *opisthomelas* Coues 1864, and *yelkouan* Acerbi 1827

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AND DR. K. JORDAN, F.R.S.

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CONTENTS OF NO. IV

NOVITATES ZOOLOGICAE

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THREE GENERA OF EROTYLID COLEOPTERA NEW TO THE AFRICAN FAUNA.

By GILBERT J. ARROW

British Museum (Natural History).

IN the *Ann. Mag. N.H.* (8), xx, p. 137 (1917), I tabulated the African genera of Erotylidae known at that date and gave a list of the species, numbering 85 in all. Since that date about 25 species have been added, chiefly by Dr. K. M. Heller, who has also characterised a new genus *Scaphodacne* (1918). In the present paper three more genera are recorded, two of them new to science, whilst the third, *Thallis* Erichs. (1842), is a genus belonging to the Australian and Papuan fauna. Three Indian insects attributed to the genus in the Junk catalogue I have shown in my volume in the "Fauna of India" series to belong to other genera. The discovery of an African representative is therefore noteworthy. It would be easy to find features by which to characterise a new genus for this species, but I know of nothing to be gained by such a course, and the surprising relationships of this African insect are better advertised by assigning it to the same genus as its nearest allies.

In *Zeitschrift für Wissenschaftliche Insectenbiologie*, vol. 6, 1910 (p. 235), an insect from East Africa belonging to this family was described by Eichelbaum as *Brechmotriplax usambarensis*, both genus and species being supposed to be new to science. This name was omitted from the 1911 catalogue of Erotylidae, and consequently from the synopsis published by me in 1917, to which I have referred in the opening sentence. A study of the description shows that *Brechmotriplax* is a synonym of *Zythonia* Westw. (1874). I have already announced that *Lophocrotaphus* Gorh. (1900) is a synonym of the same genus.

It is probable that the East African *Z. usambarensis* will prove to be distinct from the West African *Z. fulva* Westw. (1874), but the published details are too scanty to decide this point. These forms are certainly very closely related. The specimen considered by Eichelbaum to be the female of his species may possibly be a male of low development.

The types of the species here described are in the British Museum collection.

1. **Thallis jucundus,** sp. nov.

Niger, prothorace rufo, elytris viridibus, capite postice tibiis tarsisque piceo-rufis; elongato-ovalis, valde convexus, ubique breviter sat minute setosus,

antennis pedibusque brevibus, robustis, clava antennali parva, compacta, abarticulis tribus transversis composita, oculis minutis, grosse granulatis; pronoto tumido, fortiter aequaliter punctato, lateribus valde arcuatis, basi recto, angulis posticis acutis; elytris fortiter seriato-punctatis, haud striatis, punctis postice paulo minoribus.

Long. 5 mm.; lat. max. 2 mm.

KENYA COLONY: Kinangop (H. J. A. Turner, Jan.).

Several specimens have been presented by the Coryndon Memorial Museum, Nairobi, to the British Museum.

This is an unmistakable insect, with little resemblance to any other species except in its general structure. Its red prothorax, metallic green elytra and dark head, legs and antennae will enable it to be easily recognised. The antennae and legs are stout, the former with all the joints very short, the last 3 forming a small compact club, the tarsi composed of 5 distinct narrow joints. The head bears 2 stridulatory files placed far apart within the thoracic cavity. The eyes are small, very prominent and coarsely facetted. The upper surface is strongly and rather uniformly punctured, the punctures of the elytra in rows but not forming striae, and the entire body is clothed with short setae, which are fairly close upon the antennae and legs.

Trichotritoma, gen. nov.

Corpus oblongo-ovale, brevissime pubescens, pedibus robustis antennisque brevibus. Prosternum postice latum, emarginatum. Antennarum articuli 3–6 regulariter decrescentes, clava brevi, triphylla. Pedum femora robusti, tibiae latae, anticae et intermediae extus valde angulatae, tarsi pseudotetrameri, lati. Oculi parvi, minute granulati. Clypeus antice angustus, leviter emarginatus. Mandibulae latae, apice producto. Maxillae inermes, palporum articulo ultimo lato. Ligula lata, haud bilobata, palpis brevibus.

Genotype: *Trichotritoma leo*, sp. nov.

2. **Trichotritoma leo,** sp. nov.

Laete flava, oculis antennarumque articulis 5 ultimis nigris; oblongo-ovalis, corpore supra crebre punctulato, cum pedibus ubique minute flavo-pubescentibus; pronoti lateribus paulo deplanatis, leviter aequaliter arcuatis, angulis omnibus paulo productis, posticis acutis; elytris parum profunde striatis, lateribus arcuatis, paulo deplanatis; tibiis omnibus pone basin dilatatis, antica ante medium, intermedia post medium angulata, postica ante apicem minute dentata; corpore subtus nitido, parce pubescente:

♂, segmento basali ventrali medio penicillato.

Long. 12 mm.; lat. max. 6·5 mm.

N.-W. RHODESIA: Kashitu (H. C. Dollman, Feb.).

This genus is nearly allied to *Palaeolybas* Crotch (1876) and has, like it, strongly dilated tibiae and tarsi. It differs by its more elongate and depressed, not globose, form, the fine hair with which its entire upper surface is clothed, the regularly diminishing joints of the antennal footstalk, etc. It is the largest yet known of the forms, generally very small, belonging to the subfamily Tritominae, in which the sides of the mouth are not elevated but flattened out.

The legs are less short than those of *Palaeolybas*, but the tibiae have a similar angular dilatation externally, except those of the hind pair, in which there is only a slight angle near the extremity.

The whole insect is of a rich orange colour except the black eyes and terminal half of the antennae.

The 3 specimens are all males, as indicated by the very marked dilatation of the front tarsi and also by a small tuft of dense erect hairs in the middle of the first ventral sternite.

Rhynchotritoma gen. nov.

Corpus ovatum, pedibus gracilibus tarsisque pseudo-tetrameris, parum dilatatis. Caput parvum, oculis minute granulatis, parte buccali producto, rostriformi. Clypeus quam latitudinem duplo longior, angustissimus, apice bilobato. Labrum exsertum, linguiforme. Mandibula anguste producta, debilis, apice obtuso. Maxilla angustissima, unilobata, apice obtuso. Palpus maxillaris longus, articulo ultimo valde transverso. Mentum virguliforme, subtus canaliculatum, ligula quadrata, angulis anticis spiniformibus, palpis brevibus. Antennae haud longae, articulo tertio longo, clava triphylla. Prosternum postice latissimum, leviter emarginatum.

Genotype : *R. divisa*, sp. nov.

3. **Rhynchotritoma divisa,** sp. nov.

Lacte flava, nitida, elytris nigris, margine antico apicibusque exceptis, clava antennali fuscata ; breviter ovata, modice convexa, capite minute haud crebre punctato ; pronoti lateribus minutissime, dorso paulo fortius, punctatis, marginibus lateralibus leviter arcuatis, basi trisinuato, angulis anticis sat acutis, posticis obtusis ; elytris regulariter minute et crebre striato-punctatis, intervallis minutissime punctatis, corporis subtus lateribus sat fortiter punctatis ; pedibus totis flavis, gracilibus, tibiis apice vix dilatatis.

Long. 4 mm. ; lat. max. 2·5 mm.

N. Rhodesia : N'Changa (C. J. Macnamara).

This very remarkable little insect has the essential features of the great, widely distributed, genus *Tritoma* Geoffr. (1762), although differing from it in the great elongation of the fore part of the head and the corresponding attenuation of all the organs of the mouth, a modification unknown, I believe, in any other member of the family.

The head, pronotum, legs and underside are bright orange-yellow and the elytra are black, with a narrow front marginal band, broader at the outer than at the inner end, and the tips yellow, the pale colour of the latter not sharply limited anteriorly.

The body is rather broadly oval and moderately convex and the legs are slender. The head is narrow, the eyes small but prominent and the intervening space about two and a half times the breadth of one eye as seen from above. The clypeus is narrower at its base than this space, twice as long as its width at the base, its sides straight and slightly convergent and the extremity bilobed. A pair of minute stridulatory files, visible only when the head is detached, can be seen close to the sides of the occipital foramen. A small pore is distinctly visible in each angle of the pronotum.

4. **Rhynchotritoma uniformis,** sp. nov.

Flava, oculis antennisque basi excepto nigris ; breviter ovata, convexa ; capite minute haud crebre punctato, oculis sat magnis ; pronoti lateribus minutissime, dorso paulo fortius punctatis, marginibus lateralibus leviter arcuatis, basi trisinuato, angulis haud acutis ; elytris regulariter sat minute sed distincte striato-punctatis, intervallis minutissime punctatis ; corporis subtus lateribus minute punctatis.

Long. 3·5 mm. ; lat. max. 2·5 mm.

ANGOLA : Quirimbo, 75 km. inland from Porto Amboim (Dr. K. Jordan, May, 1934).

R. uniformis is very closely related to *R. divisa* (cf. p. 255), but uniformly yellow in colour and slightly smaller in average size. The eyes are a very little larger and less widely separated and the rows of punctures upon the elytra rather more accentuated. The sides of the metasternum and abdomen are less strongly punctured beneath. The club of the antenna is a little narrower than that of *R. divisa*.

NOTES ON SOME LAMELLICORN BEETLES FROM SOUTH AND EAST AFRICA, WITH DESCRIPTIONS OF NEW SPECIES.

By GILBERT J. ARROW

British Museum (Natural History).

THE following pages contain descriptions of a few of the more interesting of the Lamellicornia from South and East Africa remaining unnamed in the British Museum collection, together with notes on some related forms.

MELOLONTHINAE.

Genus **Trichinopus** Waterh. (1875).

The genus *Trichinopus* is one of several S. African Melolonthine genera of which the females are still undiscovered. They are probably of subterranean habits and no doubt in most cases without functional wings. The two previously named species have both been described from single male specimens. Of the two here described I have examined 19 male examples in all. The genus seems to be peculiar to Western S. Africa. It is chiefly remarkable for the extremely slender hind tarsi and the very long radiating hairs with which they are decorated.

T. titania Pér. (1907) is unknown to me. The description is inadequate, but as the elytra are pale yellow and the antennal club dark it is evidently not one of the forms in the British Museum collection.

1. **Trichinopus rufescens,** sp. nov.

Ferrugineo-rufus, vertice nigro elytrorumque margine externo plerumque paulo infuscato ; modice angustus, pilis griseis longissimis vestitus ; capite rugose punctato, clypeo haud brevi, fortiter punctato, antice rotundato, sutura fere recta ; pronoto nitido, punctis nonnullis setiferis inaequalibus sparsuto ; elytris rugoso-punctatis ; tibia postica brevi, apice sat lato, calcare majori longitudine metatarsi dimidio aequali, antennarum clava longitudine stipite aequali, hujus articulo 4 brevissimo.

Long. 9–10 mm. ; lat. 4–4·5 mm.

S.-W. Africa : Okahandja (R. E. Turner, Dr. K. Jordan, Dec., Jan.).

13 specimens, all males.

This species is a little deeper in colour and rather more robustly built than *T. flavipennis* Waterh. (1875). The clypeus is rounded in front and not excised and its suture is well marked and almost straight. The elytra are shorter, darker in colour and less smooth and shining. The hind legs are less slender than in the type-species, the tibia broader at the end and the longer tibial spur half as long as the basal joint of the tarsus. The club of the antenna is red, a very little longer than that of *T. flavipennis*, and the footstalk is a little shorter.

2. **Trichinopus picipennis,** sp. nov.

Rufus, capite, antennarum clava elytrisque piceis ; modice angustus, pilis griseis longissimis vestitus, capite rugoso, clypeo haud brevi, antice rotundato,

sutura recta ; pronoto nitido, punctis setiferis nonnullis inaequalibus sparsuto ; elytris rugoso-punctatis ; tibiis posticis brevibus, apice latis, calcaribus modice longis, antennarum clava stipite multo longiora, hujus articulo 4 brevissimo.

Long. 8–9 mm. ; lat. 4 mm.

S.W. AFRICA : Otavifontein (K. Jordan, Nov.), Otjosongombe, Waterberg, 1600 m. (K. Jordan, Nov.).

Like *T. rufescens*, this is less slender and delicately built than *T. flavipennis*, the clypeus is rather longer than that of either, its front margin rounded and the frontal suture straight, as in *T. rufescens*. The club of the antenna, besides being almost black, is markedly longer than in *flavipennis* and *rufescens* and the third and fourth joints of the footstalk are very short, as in *rufescens*. The hind tibia, although not quite so stout as that of *rufescens*, is more so than in *flavipennis*, the length of the tibial spurs is intermediate and the hind tarsi are a little shorter than in *flavipennis*. The abdomen, as in *T. rufescens*, is clothed with very long hairs.

3. **Oedanomerus longicornis,** sp. nov.

♂. Rufus, capite antennarumque clava nigris, corpore supra setis albis squamiformibus tecto, capite tricarinato, carinis postice longe ciliatis, clypeo antice angulato ; pronoto leviter ruguloso, lateribus medio obtuse angulatis, antice et postice convergentibus, angulis anticis obtusis, posticis nullis ; elytris haud costatis, ubique punctis minutis setiferis sparsutis, setis angustis, postice acuminatis ; antennarum clava longissima ; pedum intermediorum et posticorum tarsis longissimis.

Long. 8–9 mm. ; lat. 3·5 mm.

N.-W. RHODESIA : Livingstone, R. Zambesi (H. C. Dollman, Feb.).

This second species of the genus *Oedanomerus* has a close resemblance to the typical form, *O. hirsutus* Waterh. (1875), but can be immediately distinguished by the much longer club of the antenna in the male (the only sex known of either species), which is much longer than the footstalk and about twice the length of that of *O. hirsutus*. The organ consists of 9 distinct joints instead of 8 and the club is black instead of light brown. In addition *O. longicornis* has the pronotum rather less abruptly narrowed in front and without the smooth bare patch near the base found in the other species. The elytra are without the distinct smooth costae, and the white setae with which they and the pronotum are clothed are less flat and scalelike. The elytral scales of *O. hirsutus* are blunt at the posterior end and sometimes bifurcated, while those of *O. longicornis* are very sharply pointed. The middle and hind tarsi are longer than those of *O. hirsutus*.

DYNASTINAE.

4. **Pseudocyphonistes laevis,** sp. nov.

Nigro-piceus, corpore subtus rufescenti et partim rufo-hirto ; ornatus, nitidus, supra laevis, capite cornu brevi leviter bicuspidato armato, clypeo rugoso, truncato, vertice laevi ; pronoto laevi, antice medio irregulariter haud fortiter rugose punctato, lateribus arcuatis, paulo deplanatis et rugulosis, angulis anticis acutis, posticis fere obsoletis ; scutello antice leviter punctato ; elytris parce et minute punctatis, postice fere impunctatis, ab humeris fere ad apicem

ampliatis ; pygidio laevi, angulis lateralibus leviter punctulatis et longe ciliatis ; corpore subtus longe, haud dense rufo-hirsuto, medio fere nudo.

Long. 35 mm. ; lat. max. 19 mm.

Cape Province : Grahamstown.

There are two male specimens in the Museum collection.

In all its essential characters *P. laevis* is closely similar to *P. corniculatus* Burm. (1847), but it is darker in colour, more smooth and shining above and of less regular oval shape. The pronotum is relatively narrower and the elytra are relatively longer than in that species. The clypeus is concave and closely rugulose, as in *P. corniculatus*, and the short horn is of exactly similar shape (transverse and feebly bilobed), but the clypeus is broader in front and the anteocular ridge is narrow and nearly straight, oblique and rather prominent at the end. The pronotum is extremely smooth upon its posterior half and the anterior half bears only scanty and unequally distributed punctures or rugosity, especially in the middle and on each side at a distance from the outer margins. The elytra increase a little in width from the base almost to the extremity and, in addition to a row of punctures bordering the suture on each side, show only minute scattered punctures in the inner anterior region. The pygidium is very smooth, with a few hairs at the base and in the angles, and the lower surface and legs are much less hairy than in the other species.

5. **Heteronychus jacki,** sp. nov.

Niger, nitidus, parum late ovalis, capite subtiliter ruguloso, postice laevi, clypeo antrorsum attenuato, margine antico reflexo, medio angulato, fronte ab clypeo linea subtiliter impressa diviso ; pronoto vix perspicue punctato, lateribus fortiter arcuatis, marginatis, angulis posticis nullis ; elytris fortiter striatis, striis bene punctatis, 4 et 5 postice, 6 et 7 antice abbreviatis, intervallo secundo antice lato, haud punctato ; pygidio antice crebre sat minute ruguloso et punctato, postice laevi ; tibiis anticis inaequaliter 5-dentatis, dentibus 3 et 5 minutis, obtusissimis :

♂, tarsis anticis brevibus, crassis, ungue interiori lato ; ♀, pygidio obtuse bituberculato, intra tuberculos impresso.

Long. 9–10·5 mm. ; lat. max. 5–5·5 mm.

Kenya : Meru (Dr. Van Someren, May, June) ; Marok, Masai Reserve (A. O. Luckman, Feb., March).

This is nearly related to the very common *H. arator* F. (1792), but distinctly smaller. The clypeus is less strongly narrowed in front and its sides are less sinuated. The stridulatory bands of the propygidium are broader and less finely ridged than in *H. arator*. The species is easily recognisable in the female by the curious hollowing of the pygidium in the middle, leaving a rounded boss on each side. Upon p. 417 of his *Revision* of the genus *Heteronychus* (*T.E.S.*, 1923) Mr. Jack has mentioned 2 female specimens from Masai Reserve, Kenya, which he provisionally refers to *H. arator*, but which evidently belong to the present species. The British Museum contains a pair from Marok in the same territory. The aedeagus of the male differs markedly from that of *H. arator*. The paramera are strongly angulated laterally close to the tip and not abruptly widened at the base.

A species of *Heteronychus* from Somaliland has recently been described and figured by Paoli under the name of *H. sacchari* (*Boll. Soc. Ent. Ital.*, lxvi, 1934,

p. 47). The author has unfortunately overlooked the fact that an Indian species of the genus was given this name by myself in 1908 (*Trans. Ent. Soc. Lond.*, p. 329). In the catalogue of *Dynastidae* which I am preparing for publication the Somaliland species will be called **H. paolii,** n. nov.

CETONIINAE.

6. **Scaptobius zulu,** sp. nov.

Fusco-niger, opacus, sparse et minute griseo-setosus, clypei margine antico rotundato, verticis medio valde elevato, conico ; pronoto antice lato, postice fortiter angustato, supra minute transversim rugulato, angulis posticis longe productis, baseos medio leviter emarginato ; elytris subtiliter longitudinaliter striolatis, costis utrinque duabus perpaulo elevatis, postice connexis : abdominis segmento penultimo utrinque tuberculato, pygidio irregulariter varioloso, antice medio carinato, marginibus externis elevatis.

Long. 11 mm. ; lat. 5 mm.

S.-E. AFRICA : Zululand (Gerrard).

A single specimen of this species has been in the British Museum since 1863. It bears a note stating that it was taken in an ants' nest together with *Paussus cucullatus* Westw. (1849).

The species is nearly related to *S. natalensis* Boh. (1857) and *S. aciculatus* Schaum (1841), but is rather larger than either and differs also by its conically protuberant forehead and strongly dilated prothorax, forming a link in those respects with *S. caffer* Schaum (1841) and *S. carinifrons* Moser (1918). The clypeus is rounded at the front margin but is not limited by a carina behind, as in *S. aciculatus*. The pronotum is finely transversely rugulose, very broad in front, with strongly produced hind angles. The elytra bear numerous fine longitudinal scratches, between which two faint costae uniting before the extremity are traceable on each. The last abdominal spiracles are strongly elevated and the pygidium has a median carina upon its anterior part and is slightly hollowed on each side. The front tibia is strongly produced but very blunt at the extremity, and all the tarsi are rather long and slender, consisting of five joints differing little in length.

7. **Plagiochilus angustatus** Westw. (1894).

Plagiochilus intrusus Wasm. (1900), described by Péringuey and Wasmann almost simultaneously from the same series of specimens collected at Salisbury, Rhodesia, proves to be a very wide-ranging species. It has been found in Nyasaland, in Tanganyika and Uganda, and extends right across the African continent, for it cannot be separated from the West African *P. angustatus* Westw. (as *Coenochilus*). It probably occurs wherever its host, the ant *Plagiolepis custodiens* Smith (1858) is found. The genus *Plagiochilus* Wasm. (1900) is very nearly related to *Aspilus* Westw. (1848).

Cyclidiosoma Janson (1911) is a synonym of *Lissogenius* Schaum (1844). The remarkable structure of the front tarsus, which Janson described as six-jointed, is a feature of that genus and is more correctly described by Westwood as strangulation of the last joint. Although it appears to allow a lateral movement between the two halves, there is quite evidently no true sixth joint.

NEUE STAPHYLINIDAE AUS ANGOLA.[1]

Von DR. MAX BERNHAUER

(*Horn, Oesterreich*).

1. **Oxytelus (Tanycraerus) rhinoceros** sp. nov.

UNTER den *Oxytelus*-Arten durch die eigenartige Geschlechtsauszeichnung des ♂ sehr ausgezeichnet.

Schmutziggelb, stark glänzend, Kopf dunkler, Halsschild heller pechfarbig, Basis der Hinterleibstergite mehr oder minder schwärzlich, Wurzel der rostbraunen Fühler, Mund und Beine hell rötlichgelb. Kopf beim ♂ so breit, beim ♀ viel schmäler als Halsschild, glänzend, ohne Furchem oder Eindrücke, nur ganz vorn jederseits etwas eingedrückt, mässig kräftig und wenig dicht punktiert, beim ♂ mit viel stärker entwickelten, nach rückwärts erweiterten Schläfen, in der Mitte des Vorderrandes mit einem kräftigen, breiten an der Spitze abgestutzten Horn, beim ♀ daselbst mit zwei stumpfen Höckerchen, welche aber auch fehlen können. Fühler gegen die Spitze keulig verdickt, viertes Glied viel breiter als drittes, stark quer, die folgenden bis zum zehnten stark verdickt, stark quer, fünftes doppelt so breit und viel länger als viertes, Endglied gestreckt, länger als die zwei vorhergehenden zusammen. Halsschild fast so breit wie die Flügeldecken, mehr als um die Hälfte breiter als lang, nach rückwärts stark verengt, vor den spitz vortretenden Hinterecken deutlich ausgeschweift, gleichmässig gewölbt, ausser einer verkürzten Mittelfurche ohne deutliche Eindrücke, ebenso stark wie der Kopf und ziemlich weitläufig punktiert. Flügeldecken länger als Halsschild, zusammen viel breiter als lang, stärker als der Halsschild, etwas ungleichmässig und weitläufig, gegen die Naht und die Spitze zu feiner und spärlicher punktiert, ebenso wie der Vorderkörper stark glänzend. Hinterleib äusserst fein chagriniert, mässig glänzend, nur vereinzelt punktiert. Länge: 3–3·8 mm.

Beim ♂ ist das sechste Sternit hinten gerundet, das siebende in der Mitte Mitte mit einem breiten, langen an der Spitze zweilappigen Fortsatz, das achte tief und breit ausgehöhlt.

Angola: Ebanga, Sept. 1932, in Pilzen, Mission Scientifique Suisse (Dr. Monard). In der Sammlung des Museums in La Chaux-de-Fonds und in meiner eigenen.

2. **Oxytelus (Tanycraerus) strigosiceps** sp. nov.

Dem vorhergehenden *Ox. rhinoceros*, in dessen Gesellschaft er gefunden wurde, in Gestalt, Grösse und Färbung sehr ähnlich und von ihm nur durch den viel dichter und längsrissig punktierten, weniger glänzenden Kopf, etwas dichter punktierten, vor den abgestumpften Hinterecken nicht ausgerandeten Halsschild, etwas dichter und stellenweise längsrissig punktierte Flügeldecken, den Mangel des Hornes auf dem Klypeus des ♂, und andere Geschlechtsauszeichnung des ♂ auf dem Hinterleib verschieden. Das sechste Sternit ist am Hinterrand flach ausgeschnitten und dicht behaart, der Fortsatz am siebenten Sternit ist viel breiter und kürzer, an der Basis dieses Fortsatzes befindet sich ein kräftiger Höcker.

[1] 41. Beitrag zur afrikanischen Staphylinidenfauna.

Der Halsschild is weniger dunkel, hell rötlichgelb bis hell bräunlichgelb. Länge: 3–3·6 mm.

Vom selben Fundorte. In denselben Sammlungen.

3. **Oxytelus (Tanycraerus) monardi** sp. nov.

Von den beiden vorhergehenden Arten, mit denen die neue nahe verwandt ist, durch kleinere Gestalt und dunkle Färbung leicht zu unterscheiden.

Schwarz, glänzend, Flügeldecken und bisweilen auch Halsschild etwas heller, Wurzel der rostbraunen Fühler, Mund und Beine hell rötlichgelb. Kopf beim ♂ wenig, beim ♀ viel schmäler als Halsschild, vorn ohne Eindruck, wenig stark und spärlich punktiert, die Schläfen beim ♂ viel, beim ♀ nicht länger als die Augen. Fühler ähnlich wie bei *O. rhinoceros* (cf. no. 1). Halsschild vorn so breit wie die Flügeldecken zwischen den Schultern, um ein Drittel breiter als lang, verkehrt trapezförmig, nach rückwärts stark, ziemlich geradlinig verengt, mit etwas spitz vortretenden Hinterecken, auf der Scheibe mit ziemlich undeutlichen Längsfurchen, mässig stark und wenig dicht, unregelmässig punktiert. Flügeldecken kürzer als Halsschild, stark und dicht längsgestrichelt-punktiert, wie der Vorderkörper glänzend, zusammen viel breiter als lang, nach rückwärts etwas erweitert. Hinterleib glänzend, nur vereinzelt punktiert, im Grunde äusserts fein chagriniert. Länge: 2·5 mm.

Bei dem mir vorliegenden ♂ sind Geschlechtsauszeichnungen auf den Sterniten nicht deutlich wahrzunehmen.

Vom selben Fundorte wie die vorigen, Sept. 1932, in Pilzen, dem Entdecker, Herrn Dr. Monard, freundlichst zugeeignet.

4. **Paederus angolensis** sp. nov.

Von unserem heimischen *P. riparius* L. 1758 durch breiteren kürzeren Kopf, vorn stärker erweiterten, nach rückwärts mehr verengten Halsschild, kürzere Flügeldecken und durch einfärbig gelbe Vorder- und Mittelbeine auf den ersten Blick zu unterscheiden. Unter den afrikanischen Arten dem *P. amicus* Bernh. nahestehend, von ihm durch kürzeren, weitläufiger punktierten Kopf, viel kürzere Flügeldecken, die einfärbig hellgelben Vorder- und Mittelbeine und dunklere Fühler ebenso leicht zu trennen.

Rötlichgelb, glänzend, Kopf, Spitze der Hinterschenkel, Hinterleibsspitzen und Fühler mit Ausnahme der Wurzel und Spitze schwarz, Flügeldecken lebhaft blau. Kopf fast so breit als der Halsschild, kaum so lang als breit, nach rückwärts geradlinig, mässig stark verengt, mit verrundeten Hinterecken, zu beiden Seiten der unpunktierten Mittelzone, auf welcher nur wenige Punkte stehen, mässig kräftig und wenig dicht punktiert. Fühler gestreckt, die vorletzten Glieder etwa um die Hälfte länger als breit. Halsschild fast so breit als die Flügeldecken, etwas länger als breit, vor der Mitte gerundet erweitert, nach rückwärts ziemlich stark verengt, zu beiden Seiten der breiten, geglätteten Mittelzone wenig kräftig und sehr spärlich punktiert. Flügeldecken kaum länger als Halsschild, gegen die Spitze schwach erweitert, grob und dicht punktiert, glänzend. Hinterleib ziemlich kräftig und mässig weitläufig punktiert. Länge: 7·5 mm.

Angola: Congulu, iv.1934, Quirimbo, v.1934, gesammelt von Dr. K. Jordan.

In der Sammlung des British Museums und in meiner eigenen.

5. **Paederus monardi** sp. nov.

Diese Art ist der vorherigen recht ähnlich, unterscheidet sich aber in nachfolgenden Punkten:

Der Kopf und der Halsschild sind etwas länger, ersterer stärker nach rückwärts verengt. Flügeldecken etwas länger, der Hinterleib ist entschieden dichter punktiert. Auch die Punktierung des Kopfes ist eine dichtere. Sehr charakteristisch ist die Verschiedenheit der Färbung der Beine indem bei *P. monardi* die Schienen und ein grosser Teil der Schenkel tiefschwarz gefärbt sind, während bei, *P. angolensis* die Vorder- und Hinterbeine ganz rotgelb sind, nur die Vorderschienen sind mehr rötlich. Die Punktierung des Halsschildes ist schärfer, zahlreicher und kräftiger. Die Flügeldecken sind etwas länger als der Halsschild.

Von *P. amicus* Bernh. unterscheidet sich die neue Art durch schmäleren und längeren Kopf kürzere, dichter punktierte Flügeldecken, dichter punktierten Hinterleib, zahlreichere Punktierung des Vorderkörpers, besonders des Kopfes, welcher nach rückwärts viel stärker verengt ist. In der Färbung sind die beiden Arten fast gleich, nur sind bei *P. amicus* die Vorderbeine zu einem grösseren Teil angedunkelt. Länge: 7·5 mm.

Angola: Ebanga, November (Dr. Monard).

6. **Philonthus madianus** sp. nov.

Unter den Arten mit dreipunktigen Halsschildreihen durch die dunkle Färbung und die rauhe und dichte Punktierung des Hinterleibes und der Flügeldecken auf den ersten Blick kenntlich.

Tiefschwarz, Fühler, Taster und Beine pechschwarz, Flügeldecken und Hinterleib gelblich behaart. Kopf beim ♂ so breit, beim ♀ schmäler als Halsschild, ganz vereinzelt, hinter den Augen jedoch dicht punktiert. Die Schläfen nach hinten schwach erweitert, so lang als der Längsdurchmesser der Augen. Fühler ziemlich dick, gegen die Spitze nicht erweitert, sehr kurz behaart, ohne längere Borsten, die vorletzten Glieder deutlich quer. Halsschild fast so breit als die Flügeldecken, so lang als breit, fast parallelseitig, in den Rückenreihen mit je drei Punkten, von denen der rückwärtige vom mittleren viel weiter absteht als dieser vom vorderen, seitwärts nur mit drei Punkten. Flügeldecken etwas kürzer als Halsschild, sehr kräftig, scharf, tief und rauh punktiert, wenig glänzend. Hinterleib ziemlich kräftig, scharf und rauh, bis zur Spitze gleichmässig dicht punktiert. Länge: 10–10·5 mm.

Beim ♂ das dritte bis sechste Sternit längs der Mitte dicht goldgelb behaart, das sechste tief dreieckig ausgeschnitten, das fünfte längs dem ganzen Hinterrande sanft ausgerandet, das vierte besitzt an der Wurzel eine grosse und tiefe Aushöhlung.

Angola: Ebanga, Nov. (Dr. Monard); Uganda: Madi, Mai 1927 (Dr. G. D. Hale Carpenter).

In den Sammlungen des British Museums, des Museums in La Chaux-de-Fonds und in meiner eigenen.

7. **Zyras (Trigonodonia) luimbalensis** sp. nov.

Von *Zyras vanderijsti* Bernh. 1926, auf den man nach meiner Bestimmungstabelle kommen würde, durch viel längeren, nach hinten sehr starken verengten, herzförmigen Halsschild sofort zu unterscheiden.

Rostgelb, Kopf und Hinterleibsspitze etwas dunkler, Fühler rostbraun. Kopf schmäler als Halsschild, nach rückwärts stark erweitert, glänzend glatt, nur mit wenigen Punkten besetzt. Schläfen kurz, kaum halb so lang als der von oben sichtbare Längsdurchmesser der Augen. Fühler bis zur Spitze glänzend, drittes Glied doppelt so lang als zweites, die folgenden gleichgebildet, etwa um die Hälfte breiter als lang, gegen die Spitze allmählich etwas breiter werdend, Endglied etwas kürzer als die drei vorhergehenden zusammengenommen. Halsschild beträchtlich schmäler als die Flügeldecken, nur um ein Viertel breiter als lang, vor der Mitte stark gerundet erweitert, nach rückwärts sehr stark, ausgeschweift verengt, neben dem Seitenrande flach ausgebreitet, vor dem Schildchen mit einem schwachen Grübchen, neben den verrundeten Hinterecken mit je einem Längseindruck, auf der Oberseite glänzend glatt, nicht chagriniert, fast ohne jede Punktierung. Flügeldecken um ein gutes Stück länger als Halsschild, deutlich chagriniert, wenig glänzend, sehr spärlich mit äusserst zarten Pünktchen besetzt. Hinterleib äusserst fein netzartig chagriniert, kaum punktiert. Länge: 6·5 mm.

Angola: Luimbale, Mt. Moco, 1800–1900 m., iii.1934 (K. Jordan). In der Sammlung des British Museums und in meiner eigenen.

8. **Zyras (Trachydonia) pallescens** sp. nov.

Eine durch die Färbung und die höckerartige Punktierung des Halsschildes sehr ausgezeichnete Art. Neben *Z. tuberculicollis* Bernh. 1926 zu stellen, von dem sie sich aber durch die auffallende Färbung, kürzeren Halsschild, viel kürzere Flügeldecken und etwas weitläufigere Körnelung leicht unterscheiden lässt.

Pechschwarz, Halsschild und Flügeldecken weissgelb, Wurzel der bräunlichen Fühler, Taster und Beine hell rötlichgelb, äusserste Basis der Flügeldecken einschliesslich des Schulterrandes und eine grosse dreieckige Makel am Schildchen, welche sich nach rückwärts stark verschmälert und nach rückwärts bis zum zweiten Drittel der Naht reicht, tiefschwarz, Hinterränder der Abdominalringe rötlich. Kopf beträchtlich schmäler als Halsschild, quer, glänzend, kräftig und tief, nicht körnig und ziemlich weitläufig punktiert, längs der Mitte beim ♂ breit geglättet und etwas niedergedrückt. Augen gross, Schläfen kurz, vom Augenhinterrand schräg zum Halsschild verengt. Fühler gegen die Spitze verdickt, drittes Glied um die Hälfte länger als zweites, die folgenden nicht, die vorletzten ziemlich stark quer, ungefähr um die Hälfte breiter als lang, Endglied kürzer als die zwei vorhergehenden zusammengenommen. Halsschild fast so breit als Flügeldecken, um die Hälfte breiter als lang, nach rückwärts stark verengt mit verrundeten Hinterecken, neben dem ganzen Seitenrand ziemlich tief und breit gefurcht, vor dem Schildchen mit einem undeutlichen Eindruck, ziemlich dicht und sehr kräftig, beim ♂ längs der Mittelpartie weitläufiger und noch stärker gekörnt, zwischen den Körnern glänzend glatt. Flügeldecken wenig länger als Halsschild, an der Naht ungefähr um ein Drittel kürzer als zusammen breit, ähnlich wie der Halsschild und sehr dicht gekörnt, jede beim ♂ vor der Mitte des Hinterrandes mit einer tiefschwarzen, spiegelglänzenden, senkrecht über die Fläche der Flügeldecken aufragenden, gegen die Naht zu stärker erhobenen Querlamelle. Hinterleib nach rückwärts nur unmerklich verengt, glänzend glatt, an der Wurzel der Tergite mässig stark und weitläufig punktiert. Länge: 4–4·5 mm.

Beim ♂ besitzt das siebente Tergit an der Basis in einiger Entfernung von der Mittellinie je ein kräftiges Kielchen.

Angola: Quirimbo, v.1934 (K. Jordan).

In denselben Sammlungen wie die vorherige Art.

Zyras: Acanthocnemidonia subg. nov.

Nach meiner Tabelle (*Arch. Naturg.* 92A, 6, 1926, p. 21) gelangt man zu der Untergattung *Platydonia* Bernh. 1926. Von dieser und den anderen Untergattungen mit zwei Längsstrichen am siebenten Tergit unterscheidet sich das neue Subgenus durch die Bedornung sämtlicher Schienen. Die Fühler sind kurz, seitlich nur schwach zusammengedrückt, der Halsschild stark quer, mit scharfen Hinterecken, seitlich eingedrückt, die Seitenränder und der Hinterrand scharf gerandet.

9. Zyras (Acanthocnemidonia) miricauda sp. nov.

Gelbrot, Kopf, Hinterecken der Flügeldecken, und Hinterleib zum Teil dunkler. Kopf viel schmäler als Halsschild, quer, ziemlich glänzend, mässig stark und wenig dicht punktiert. Augen gross, Schläfen sehr kurz. Fühler sind kurz, beträchtlich kürzer als Kopf und Halsschild zusammen, drittes Glied nur mässig länger als zweites, viertes bei breitester Ansicht kaum, die folgenden deutlich quer, die vorletzten etwas um die Hälfte breiter als lang, das Endglied viel kürzer als die zwei vorhergehenden zusammengenommen. Halsschild so breit als die Flügeldecken, mehr als doppelt breiter als lang, an den Seiten ziemlich gleichmässig gerundet, nach vorn ein wenig mehr verengt, mit mehr oder minder scharfen Hinterecken, neben den scharf gerandeten Seiten mit einem ziemlich starken Schrägeindruck auf der hinteren Hälfte, zwischen diesem Eindruck und dem Seitenrand ziemlich dickkantig abgesetzt, vor dem Schildchen mit einer feinen gebogenen kielförmigen Querlinie, ziemlich fein und ziemlich weitläufig punktiert, im Grunde mehr oder weniger deutlich chagriniert. Flügeldecken länger als Halsschild, zusammen stark quer, ziemlich dicht, scharfkörnig punktiert, zwischen den Körnern sehr deutlich chagriniert, mässig glänzend. Hinterleib matt, nach rückwärts wenig verengt, sehr fein und ziemlich dicht punktiert und überdies deutlich chagriniert, das dritte (erste vollkommen freiliegende) Tergit in der Mitte des Hinterrandes mehr oder minder deutlich zahnförmig vorgezogen, fünftes an der Basis in eine breite Querbeule erhoben, vor dem Hinterrand der einzelnen Tergite mit einer Querreihe von Körnchen, welche am siebenten und achten Tergit als scharfe Kielchen ausgebildet sind, achtes Tergit und sechstes Sternit am Hinterrande mit einer Anzahl langer, scharfer Dornen bewehrt. Ob diese Auszeichnungen nur beim ♂ vorhanden sind, kann ich vorläufig mit Sicherheit nicht feststellen. Länge: 6·5 mm.

Angola: Luimbale, Mt. Moco, 1800–1900 m., 2.iii.1934 (K. Jordan). In der Sammlung des British Museums und in meiner eigenen.

10. Zyras (Parophthalmonia) arrowi nov. spec.

Von *Z. semiopacus* Bernh. 1926, mit dem die neue Art den glanzlosen Vorderkörper gemeinsam hat, durch kürzeren, fast unpunktierten, in der Mitte nicht eingedrückten Halsschild, sehr stark entwickelte Eindrücke neben den Seiten, die Querkiele vor dem Hinterrand und die kräftig und nicht allzu dicht gekörnten Flügeldecken leicht zu unterscheiden.

Pechbraun, der grössere Teil des Halsschildes, eine von der Schulter bis über die Hälfte der Flügeldecken reichende verwischte Längsmakel und die Hinterränder der Hinterleibsringe rötlich, Taster und Beine hell rötlichgelb. Kopf viel schmäler als Halsschild, quer, vollkommen glanzlos, mit einigen wenigen überaus zarten, feine Haare tragenden Pünktchen. Augen sehr gross, fast die ganzen Kopfseiten einnehmend Fühler kurz, gegen die Spitze verdickt, zweites und drittes Glied fast gleichlang, viertes oblong, die folgenden an Länge allmählich ab—und an Breite zunehmend, seitlich zusammengedrückt, die vorletzten Glieder bei breitester Ansicht um die Hälfte breiter als lang, Endglied fast länger als die beiden vorhergehenden zusammengenommen. Halsschild fast so breit als die Flügeldecken, doppelt so breit als lang, an den Seiten ziemlich gleichmässig gerundet, neben dem Seitenrande breit und tief der Länge nach eingedrückt, unmittelbar neben dem Seitenrand mit einem scharfen Parallelkiel, welcher sich in geringer Entfernung zum Hinterrande, parallel mit diesem, auf die Basis des Halsschildes fortsetzt, gegen das Schildchen zu dicker wird und in einem etwas glänzenden Höckerchen endigt. Diese beiden Höckerchen sind durch eine Querfurche ziemlich weit getrennt. Skulptur des Halsschildes kaum von der des Kopfes verschieden. Flügeldecken um ein gutes Stück länger als Halsschild, glanzlos chagriniert, und überdies mit winzigen, aber scharfen, etwas glänzenden Längshöckerchen mässig dicht besetzt. Hinterleib gleichbreit, fein und dicht, am siebenten Tergit feiner und weitläufiger punktiert, achtes am Hinterrande weitläufig gezähnelt. Länge: 8 mm.

Vom selben Fundorte wie die vorhergehende Art; in der Sammlung des British Museums und in meiner eigenen.

Zyras: Anophthalmodonia subg. nov.

Fühler seitlich stark zusammengepresst, siebentes Tergit beiderseits mit einer scharfen Längsfurche, Hinterleib konisch zugespitzt, Kopf beim ♂ ohne Grübchen hinter dem Stirnhöcker. Mit der Untergattung *Parophthalmonia* Bernh. 1926 nahe verwandt, durch den Mangel der Stirngrübchen und den stark zugespitzten Hinterleib sofort von ihr zu unterscheiden. Von *Apostenonia* Bernh. lässt sich die neue Untergattung ebenso leicht durch weniger umgeschlagene Halsschildseiten, scharf winkelig nach unten vorragende Schläfen und das Vorhandensein von zwei scharfen Stacheln am Prosternum trennen.

11. Zyras (Anophthalmodonia) jordani nov. spec.

Eine sehr stattliche Art, pechschwarz, gelblich behaart, Flügeldecken pechbraun, Halsschild, Taster und Beine rötlichgelb, Fühler rostbraun. Kopf beträchtlich schmäler als Halsschild, matt chagriniert und ziemlich fein und spärlich punktiert, Augen gross, Schläfen sehr kurz. Fühler sehr gestreckt, alle Glieder viel länger als breit, drittes Glied um die Hälfte länger als zweites, Endglied nur wenig länger als vorletztes. Halsschild fast so breit als die Flügeldecken, um die Hälfte breiter als lang, an den Seiten ziemlich gleichmässig gerundet, nach rückwärts etwas stärker verengt, mit vollständig und breit verrundeten Hinterecken, neben dem ganzen Seitenrande der Länge nach tief ausgehöhlt, ziemlich kräftig chagriniert, matt, und überdies ziemlich fein und wenig dicht punktiert. Flügeldecken nicht länger als Halsschild, zusammen doppelt so breit als lang, fein chagriniert, ziemlich kräftig und dicht punktiert, glänzender als

Halsschild. Hinterleib nach rückwärts stark zugespitzt, wenig fein und mässig dicht, hinten weitläufiger punktiert, glänzend. Länge: 10·5 mm.

Beim ♂ ist das dritte (erste vollkommen freiliegende) Tergit am Hinterrande flach ausgerandet, an den Seiten in je einen kräftigen und langen, schief von der Tergitfläche in die Höhe sich erhebenden, etwas gekrümmten und oben punktierten Stachel ausgezogen, das fünfte Tergit ist in der Mitte in einen breiten und langen, seitlich etwas zusammen gedrückten, spiegelglänzenden Höcker erhoben, das siebente besitzt ausser den tiefen Längsfurchen zwischen diesen vor dem Hinterrande mehrere kleinere Kielchen, das achte Tergit ist in der Mitte vorgezogen und besitzt am Hinterrande fünf kurze Zähnchen, vor dem mittleren befindet sich auf der Fläche des Tergites ein kräftiges, kielförmiges hinten zahnförmig vorragendes Höckerchen.

Angola: Luimbale, Mt. Moco, 1800–1900 m., iii.1934, entdeckt von K. Jordan, dem die hervorragende neue Art freundlichst zugeeignet sei.—Die hier beschriebenen, von mir gesammelten Staphyliniden wurden beim Nachtfalterfang am Licht erbeutet. K. J.

12. **Tetrallus angolensis** sp. nov.

Mit der folgenden Art sehr nahe verwandt, von ihr nur durch schmäleren Kopf, viel schmäleren längeren Halsschild, längere Flügeldecken, dichtere Punktierung und Behaarung verschieden. Halsschild fast nur um ein Viertel breiter als lang, nach vorn stärker verengt, mit weniger verrundeten Hinterecken, längs der Mitte oft niedergedrückt. Kopf kaum halb so breit als Halsschild, Flügeldecken viel länger als Halsschild. Länge: 2–2·5 mm.

Angola: Ebanga, Sept. 32, in Blüten (Dr. Monard).

In der Sammlung des Museums in La Chaux-de-Fonds und in meiner eigenen.

Ich benutze die Gelegenheit, eine der vorigen ähnliche südafrikanische Art zu beschreiben.

13. **Tetrallus densiventris** sp. nov.

Von *Tetrallus capensis* Bernh. auf den ersten Blick durch die sehr dichte Punktierung und die kurzen keulig verdickten Fühler zu unterscheiden.

Schwarz, wenig glänzend, die ersten vier Glieder der schwärzlichen Fühler hell rötlichgelb, die Taster und Beine pechbräunlich. Kopf mehr als halb so breit als Halsschild, sehr fein und nicht allzu dicht punktiert. Fühler gegen die Spitze stark verdickt, drittes Glied viel kürzer als zweites die vorletzten mindestens um die Hälfte breiter als lang, Endglied so lang als die zwei vorhergehenden zusammengenommen, hinter der Mitte etwas abgeschnürt. Halsschild so breit als Flügeldecken, fast um die Hälfte breiter als lang, an den Seiten stark gerundet, fast um die Hälfte breiter als lang, an den Seiten stark gerundet, nach vorn etwas mehr verengt, ähnlich wie der Kopf punktiert, grau behaart, mit verrundeten Hinterecken. Flügeldecken etwas länger als Halsschild, am Hinterrande innerhalb der Hinterecken scharf ausgerandet, weniger fein und viel dichter als Halsschild punktiert. Hinterleib nach rückwärts wenig verengt, mässig fein und sehr dicht, ziemlich gleichmässig punktiert. Länge: 2–2·2 mm.

Kapland: Mossel Bay, Dez. 1934 (R. E. Turner).

In der Sammlung des British Museums und in meiner eigenen.

PRELIMINARY NOTE ON THE TREMATODE PARASITES OF *PERINGIA ULVAE* (PENNANT) 1777.

BY MIRIAM ROTHSCHILD.

IN 1932 Dr. Marie V. Lebour suggested that an investigation of *Peringia ulvae* (Pennant) 1777, a brackish-water gastropod, would probably provide new material for study of larval trematodes. During the last three years 2,000 have been examined by me from Plymouth, 500 from Scotland, and 200 from Wales.

Twenty-four new species of cercariae and metacercariae have been discovered, the majority of which appear to have birds as their final host. A list of the groups to which the various species belong is appended. A detailed account of their morphology, together with life-history experiments, will, it is hoped, be published shortly.

My very best thanks are due to Mr. Richard Elmhirst, Dr. Edith Nicol, Dr. Gwendolen Rees, and Dr. Ruth Sanderson for sending me samples of snails from different localities.

LARVAL TREMATODES FROM *PERINGIA ULVAE*.

OOCYSTA GROUP.
Cercaria oocysta Lebour 1907 (encystment in first host).
Cercaria pirum Lebour 1907 (ditto).
Cercaria A. (ditto).

UBIQUITA GROUP.
Cercaria ubiquita Lebour 1907.
Cercaria B.
Cercaria C.

PLEURO-LOPHOCERCA GROUP.
Cercaria lophocerca Lebour 1907 (non Fil.).
Cercaria D.

EPHEMERA GROUP.
Cercaria ephemera Lebour 1907 (non Nitzsch) (encystment in free state).
Cercaria E. (ditto).
Cercaria F. (ditto).
Cercaria G. (ditto).

ECHINOSTOME GROUP.
Cercaria of *Echinostomum leptosomum* (Creplin) Villot 1896.
Cercaria of *Echinostomum secundum* (Nicoll) Lebour 1905.
Cercaria H.

METENTERA GROUP.
Cercaria I (encystment in free state).
Cercaria J. (ditto).

SAGITTARIUS GROUP.
Cercaria K (encystment in first host).

OF UNKNOWN SYSTEMATIC POSITION.
Cercaria L.
Cercaria M.
Cercaria N.
Metacercaria A.
Metacercaria B.

MEGABOTHRIS RECTANGULATUS WAHLG. 1903, A FLEA NEW TO GREAT BRITAIN.

BY MIRIAM ROTHSCHILD.

(With 6 text-figs.)

♂. *Ceratophyllus rectangulatus* Wahlgren, *Arkiv för Zool. Stockholm*, 1, p. 182, Taf. 8, fig. 7 (1903).
♂. *Ceratophyllus baikalensis* Ioff, *Annuaire Mus. Zool. Acad. Sci. U.S.S.R.*, 28, p. 414, fig. 2 (1927).
♂♀. *Ceratophyllus rectangulatus*, Jordan, *Nov. Zool.*, 38, p. 256, fig. 12, ♀ (1932).
Megabothris rectangulatus, Jordan, *l.c.*, 39, p. 77 (1933).

THIS exceptionally interesting discovery was made by Mr. D. H. S. Davis in Glenfinart, Argyllshire, where he obtained a series of 6 ♂♂ and 8 ♀♀ from nests of *Microtus agrestis neglectus* Jenyns 1841, together with the closely related species *M. walkeri* Roths. 1902 and *M. turbidus* Roths. 1909.

M. rectangulatus is a flea with a northern distribution, being recorded from Norway, Lapland, and Transbaikalia. It is perhaps tempting to speculate on whether, like *Ceratophyllus borealis* Roths. 1907, a bird flea with an otherwise somewhat similar northern distribution, it will eventually be recorded from the Alps.

The ♂ of *M. rectangulatus* was originally described by Wahlgren (1903), and redescribed by Ioff (1927) under the name *Ceratophyllus baikalensis*. Jordan (1932) suggests that judging from the figure this may prove a subspecies of *M. rectangulatus*. The long series of specimens from Lapland and Norway in the British Museum (N. C. Rothschild collection) show much individual variation, but I have been unable to discover any constant geographical variation between the Scandinavian and the Scottish specimens.

The ♀ was later obtained in Lapland (Jordan, 1932). A detailed description of both sexes is given below.

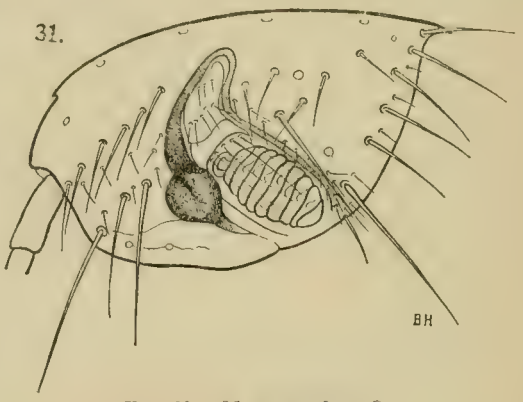


FIG. 31.—*M. rectangulatus* ♀.

♂♀. *Head.*—Tubercle well developed. In ♂ apex of tubercle above level of first bristle of anterior row of frons, in ♀ on a level with this bristle. Frons with two rows of bristles. Anterior row contains 5–6 medium fine bristles, more obliquely set in ♂. Posterior row with 3 strong bristles. In addition several minute hairs scattered over surface, two of which are placed between first and second, and one between second and third bristles, of posterior row. Occiput with two incomplete rows of bristles in addition to the submarginal row of 12 bristles.[1] First contains 2 medium fine bristles, and

[1] Unless otherwise stated these figures refer to both sides of the sclerites.

second 4 (each side), of which the first near antennal groove long and strong. Row of bristles bordering the antennal groove contains 14–20 minute hairs, and in ♀ one medium-sized long bristle situated below corner bristle of submarginal row. Marginal bristles on second segment of antennae reach beyond middle of club in the ♀. Labial palpi $\frac{7}{8}$ length of fore coxae. Proportional lengths of segments of maxillary palps (subject to slight variation) are: ♂ 12–11–7–13; ♀ 14–14–10–16.

Thorax.—Pronotal comb usually with 20 teeth, first on either side considerably smaller than rest. In five specimens one of these missing altogether. Along mid-dorsal line the comb is $\frac{1}{5}$ longer than the pronotum. Single row of 12–13 bristles in front of comb, of which first is longest. Mesonotum and metanotum with submarginal row of 12–14 bristles. Three irregular rows of small bristles

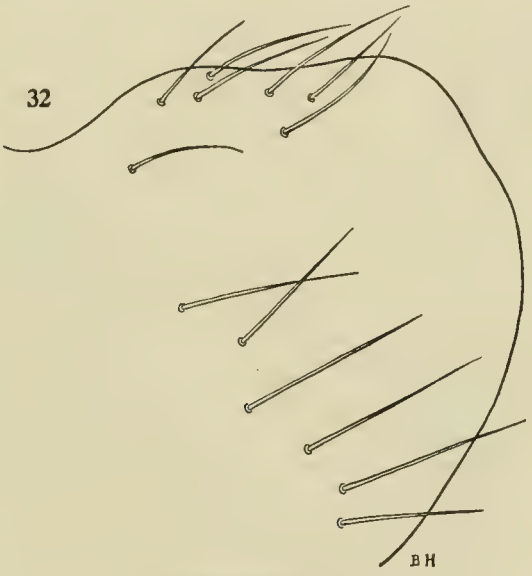


Fig. 32.—*M. rectangulatus* ♂; tergite VIII.

on mesonotum and two on metanotum, with a few additional bristles farther forward. Mesosternite with 16–20 strong bristles and 6–12 fine hairs. Metepisternum with 1 stout bristle, 1–3 finer ones below it (each side). Metasternum with 1 stout bristle. Metepimerum with 6–10 strong bristles (each side), sometimes a minute hair near stigma.

Abdomen.—Tergites I–IV with vestigial comb of 2–6 teeth. Tergite I with posterior row of 12 strong bristles, in front of this a row of small bristles and farther forward some additional small dorsal bristles. Tergites III–VII with row of 16 strong bristles, in front some additional dorsal bristles. Antepygidial bristles three each side (one ♀ with four on one side), ♂ with centre bristle ten times as long as lateral bristles, in ♀ only three times as long; upper lateral bristle generally a shade longer than lower lateral bristle. Basal sternite with pair of stout bristles; occasionally 2 fine hairs in front of these. Sternites III–VI with 4–10 bristles and 2–6 fine hairs in front of them.

Legs.—As in *M. walkeri.*

Modified Segments.—♂. Tergite VIII (text-fig. 32) large as in allied species, rounded except for a flattening of dorsal margin ; row of 5–6 stout, widely spaced bristles following upper margin, but a little way from it ; 6–13 additional bristles scattered over the outer surface, of which 4–7 form vertical row close to edge of sternite VII, at right angles to ventral margin. Sternite VIII (text-fig. 33) resembling runner of a sleigh as in *M. walkeri* ; the proximal widened portion shaped like a boot, with the toe directed upwards ; the weakly chitinized

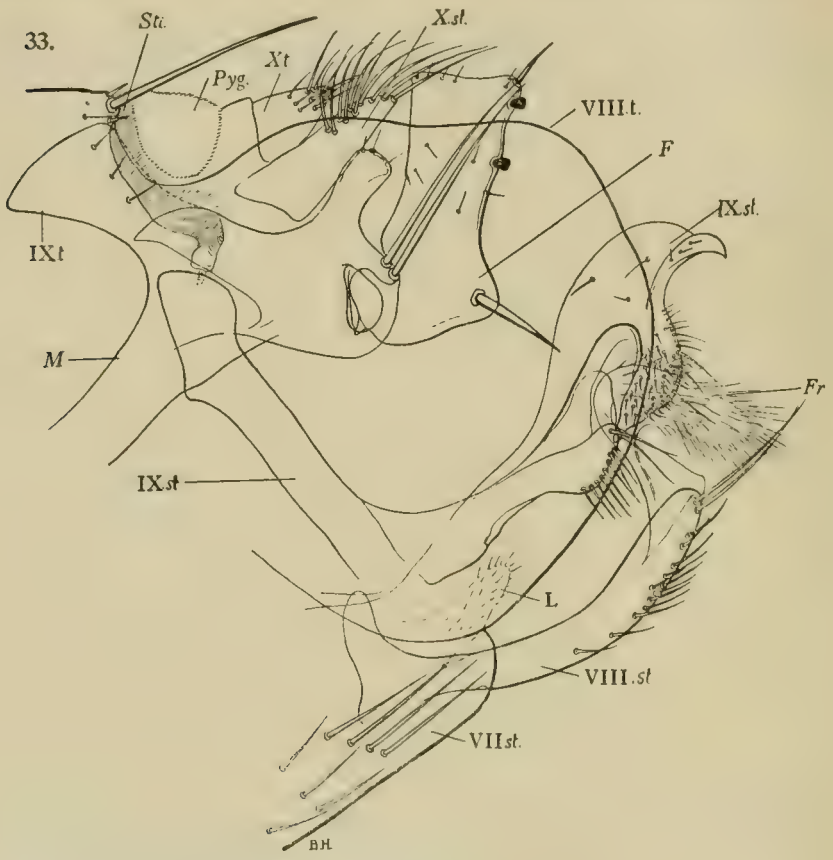


FIG. 33.—*M. rectangulatus* ♂ ; terminal segments.
F, exopodite; *Fr*, fringe; *L*, membranous appendage of sternite VIII; *M*, manubrium of clasper; *P*, process of clasper; *Pyg.*, pygidium; *Sti.*, stigma cavity.

apical lobes with copious fringe ; a single row of small bristles along ventral margin ; 2–4 long stout bristles at apex (5 in one specimen). Above base of sternite VIII a triangular membranous lobe, bearing numerous hairs. Tergite IX resembles that of *M. walkeri*, but process P of clasper broader in comparison with its length, also wider at apex than in centre. Manubrium (M) of the clasper as wide across the centre as exopodite F. Finger F much longer than P, upper third almost square or oblong, lower two-thirds with frontal margin slightly incurved and hind margin straight ; proportional breadth and width of finger, measured along apical dorsal margin, and distance from anterior dorsal angle to

lowest point of base is 15 : 39 ; from apical dorsal angle to insertion of thorn-like subventral bristle measures 29 (to same scale) ; a strong bristle placed at dorsal posterior angle and immediately below this on posterior margin a wedge-shaped spine broadest at apex ; a second similar spine placed some distance below first ; these spines vary somewhat in position but are placed on widened portion of finger ; at ventral posterior angle, which is produced into small rounded lobe, a very stout thorn-like bristle ; a few bristles near margin and on outside of finger. Sternite IX with horizontal arm divided into anterior and posterior portion by deep sinus on ventral side ; posterior portion prolonged into downwardly curved beak ; below this, on ventral surface, it forms a second process recalling the reversed head of a

FIG. 34.—*M. rectangulatus* ♂ ; terminal portions of parameres.

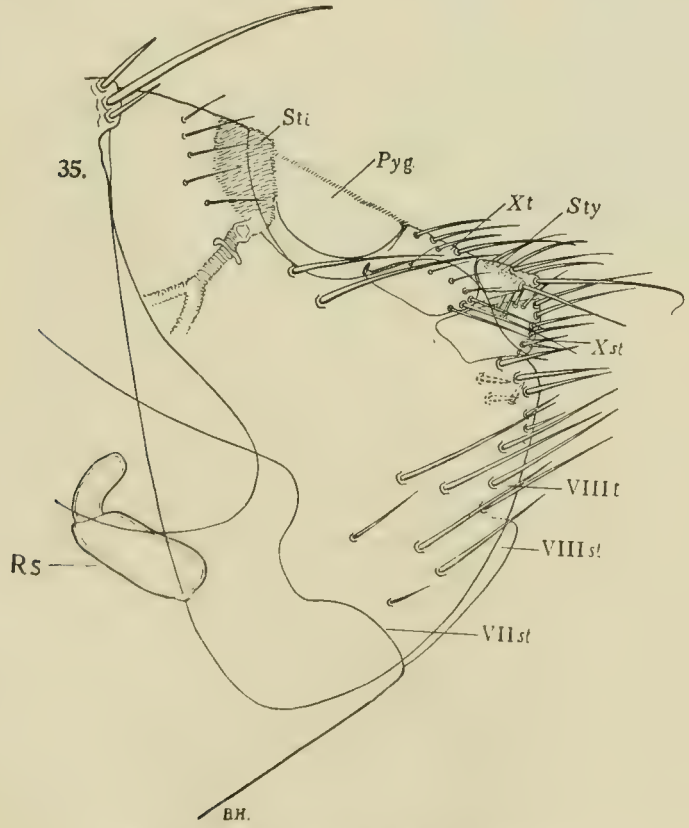


FIG. 35.—*M. rectangulatus* ♀ ; terminal segments. *R.s.*, receptaculum seminis ; *Sty*, stylet.

bird with the beak directed frontad and the rounded portion set with short stout bristles. Anterior portion is rounded proximally to the sinus and here

set with bristles. Paramere (text-fig. 34) of penis with dorsal portion convex, ending apically in short hook. Sternite X longer than tergite X, with row of bristles along upper margin, eight of which are long and of about equal length.

♀. Sternite VII (text-figs. 35, 36) with fairly regular row of 5–8 strong bristles with 7–12 similar bristles in front (each side); upper margin distinctly concave; sinus shallower than in *M. walkeri*, both lobes being broader and rounded off. Tergite VIII with 2 bristles below stigma, 3 strong bristles in a row near margin at ventral apical angle, 10–13 additional bristles on outer surface, 2–3 on inner surface near apex, outline rounded, except for slight depression immediately below dorsal apical angle and the 3 marginal bristles. Stigma cavity vertically half the length of longest antepygidial bristles. Stylet conical, a little more than twice as long as broad. Receptaculum seminis with head more than twice as long as broad (5 : 2), tail half length of head and nearly three times as long as wide (4 : 11).

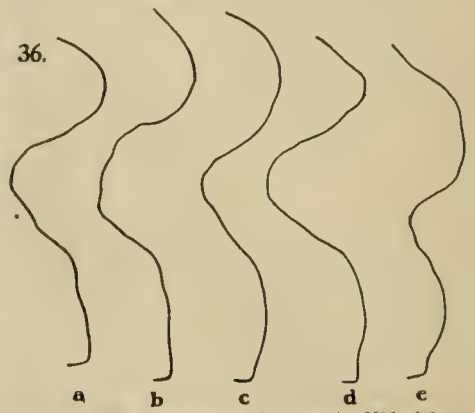


FIG. 36.—*M. rectangulatus* ♀; sternite VII of five specimens.

Length: ♂ 2·7 mm.–3 mm.; ♀ 2·4 mm.–3·2 mm.

My best thanks are due to Miss B. Hopkins for executing the figures.

THE ANTHRIBIDAE OF MAURITIUS.

By DR. KARL JORDAN, F.R.S.

(With 13 text-figures.)

EARLY in 1935 I received from Mr. Jean Vinson, Mauritius, a collection of *Anthribidae* obtained in recent years by himself, Mr. Ray. Mamet and Mr. G. Morin at various places on Mauritius. The collection was most welcome, as only a few species were known from that island. Of the six species described from Mauritius I have seen the types of *Tropideres tessellatus* Bohem. 1859 and *Caranistes variegatus* Bohem. 1859, which Dr. O. Lundbeck kindly sent me for inspection, the type of *Dinephrius mauritius* Jord. 1924 is at Tring, and the remaining three species I have identified from the descriptions. As explained hereafter, *D. mauritius* is the same as *D. dorsatus* Fairm. 1901, and *Apolecta filicornis* Fairm. 1903 the same as *Caranistes variegatus*, while *Eucorynus clavator* Fairm. 1903 is identical with the common Oriental *Eucorynus crassicornis* Fabr. 1801. In 1914 I recorded *Phloeobius gigas cervinus* Klug 1833 from Mauritius, and Mr. J. Vinson in 1934 *Araecerus fasciculatus* Degeer 1775. Mr. J. Vinson records also "*Phloeobius nigroungulatus* Gyll. and *Phl. longicornis* F."; but both names refer in this case very likely to ♀ and ♂ of *Phl. g. cervinus*. The number of Mauritian species hitherto known is therefore reduced to six. The collection submitted to me by Mr. J. Vinson contains no less than 20 species, of which 17 are new, one of which, a small *Araecerus* Schönh. 1825, I have left unnamed, as it is represented by a single specimen in indifferent condition. The only distinct species described from Mauritius which is not in the collection is *Trop. tessellatus*. The 22 species here recorded may be taken as representing the majority of Anthribids inhabiting the island. A number of small species other than those obtained must be expected to occur, forms more or less distantly related to those known from Rodriguez and the Seychelles. But such new discoveries will hardly invalidate the conclusions to which the 22 species point. I had expected to find in Mr. Vinson's collection some of the 10 species recorded from Rodriguez,[1] but the anticipation was not realized. Analysing the distribution and relationship we arrive at the following results.

1. *Eucorynus crassicornis* and *Araecerus fasciculatus* are of Oriental origin and probably of quite recent introduction. The second *Araecerus* (left unnamed and not listed) is of Oriental affinity and may also be a recent arrival.

2. *Phloeobius gigas cervinus* is the Malagassic representative of the Oriental *Phl. gigas*, which is widely distributed in the Oriental Region from India to the Pacific. The occurrence on Rodriguez, Mauritius, Réunion, Madagascar and the Seychelles is evidence that the insect has been in the Malagassic Subregion for a considerable time, during which the slight differences have been acquired that distinguish this subspecies from its Oriental co-subspecies of *Phl. gigas*.

3. The remaining 19 species are peculiar to Mauritius, showing affinities to the Anthribids of either Rodriguez, Réunion, or Madagascar:

Caranistes, of which we record 3 species, is abundantly represented on Madagascar, and one species is known to occur on Réunion (*Palaxia aranea* Coquerel 1866).

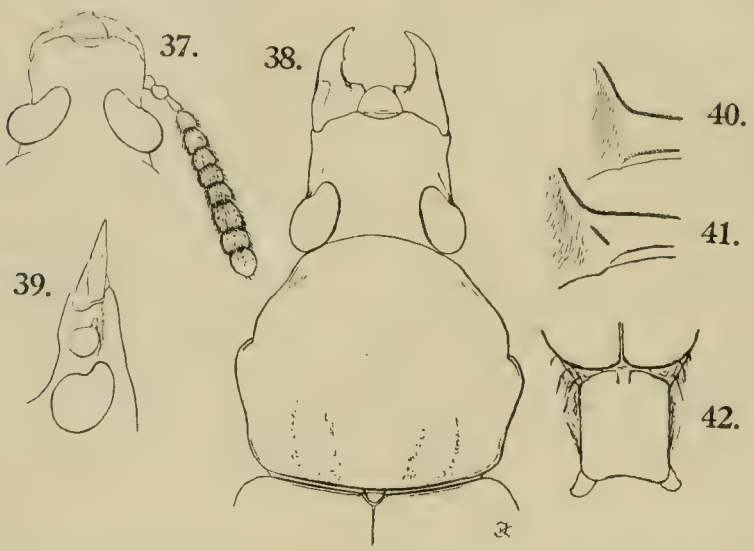
[1] Nov. Zool., xxxi, p. 227 (1924).

Dinephrius, with 4 Mauritian species, has one species on Rodriguez ; *Caranistes dionysius* Coquerel 1866, from Réunion, probably belongs to this genus, which is not known from Madagascar.

The new genus *Nesidobius*, with 5 Mauritian species, is represented on Rodriguez by one species which comes fairly close to *N. tessellatus* Bohem. 1859, and to two new species.

Monosirhapis, also new, with 3 species, is probably represented on Réunion by the species figured by Coquerel in 1866 as *Tropideres tessellatus*.

The three other new genera are so far known only from Mauritius. The *Anthribidae* of Réunion (= Bourbon) are practically unknown, only 4 indigenous



species having been recorded, all related to Mauritian insects as far as I can judge from the figures or descriptions. I assume that intermittently an exchange of species has taken place between these neighbouring islands, which would explain the occurrence on Mauritius of species closely related to each other, one allied species having originated on Réunion and the other on Mauritius. Isolation and subsequent migration would result in a number of nearly related species occurring side by side. It is evident from these remarks that the knowledge of the *Anthribidae* of Réunion would have a great bearing on the discussion of the problem just touched. The study of a collection of *Anthribidae* from Réunion, therefore, approximately as good as that submitted by Mr. Jean Vinson from Mauritius, is much to be desired. Meanwhile, we have to be content with the very satisfactory collection which forms the subject of this paper, and for which we express our sincerest thanks to Mr. Jean Vinson and his colleagues.

1. **Eucorynus crassicornis** Fabr. 1801.

Syn.: *Eucorynus clavator* Fairm., *Rev. d'Ent.*, xxii. p. 43 (1903) (Mauritius).

In *Rec. Ind. Mus.*, ix, p. 211 (1913) I placed *E. clavator* as a synonym of *E. crassicornis*. Specimens received from Mauritius (C. Antelme) confirm the

opinion. Mr. J. Vinson did not send the species, upon which I look as a comparatively recent introduction.

2. **Phloeobius gigas cervinus** Klug 1833.

Phloeobius nigroungulatus Gyll., Vinson, *Trans. Roy. Soc. Arts & Sci. Mauritius*, (C) 3, p. 188 (1935) (Mauritius).

Phloeobius longicornis F., Vinson, l.c. (Mauritius).

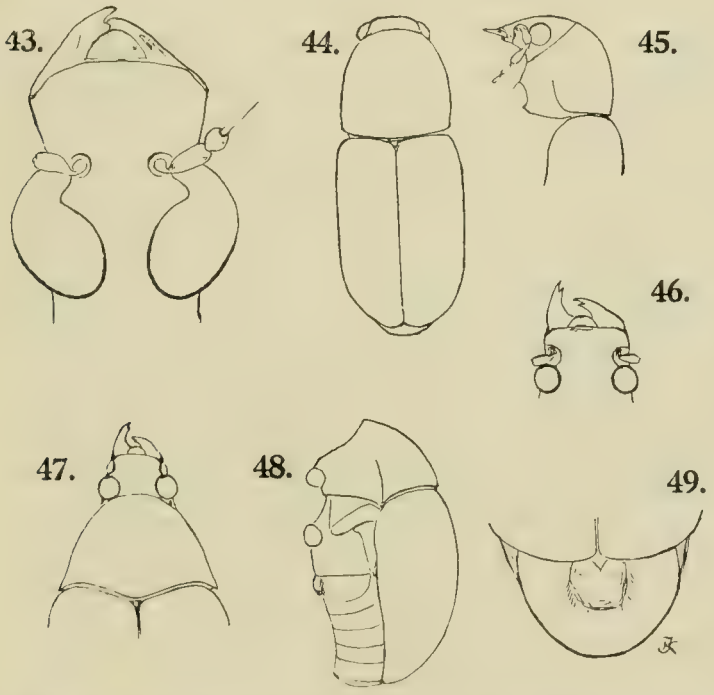
Phloeobius gigas cervinus Klug, Jord., *Trans. Linn. Soc. Lond.*, (2), xvi, *Zool.*, p. 255 (1914) (Seychelles, Mauritius, Bourbon, Madagascar).

Not received from Mr. J. Vinson. We have two old specimens from Mauritius and several from Réunion.

Heniocera gen. nov.

♂♀. Distantly related to *Basitropis* Jekel 1855, but in general appearance recalling *Epitaphius* Fairm. 1898 apart from the small size of the two species here described. Easily recognized by the peculiar antenna (text-fig. 37).

Rostrum short, much broader than long, flat, apical margin with median



sinus. Eye oblique, lateral, but much encroaching on upperside, particularly in ♂, with small but distinct sinus towards antenna, frontal portion of eye narrower than lateral portion. Antenna similar in ♂ and ♀, reaching a little beyond base of elytra, segments I and II short, II cask-shaped, III somewhat longer, conical, IV to XI flattened, broadened, IV to IX gradually widened, more or less closely appressed, excised at apex, all rough with short stiff hairs, VIII much broader than long, IX about as long as VII and VIII and a little broader, X somewhat longer than VIII, XI ovate-elliptical. Antennal groove triangular, covered by

lateral edge of rostrum, separated from eye by a narrow interspace ; underside of rostrum at right angle to throat, lobes of labiophore strongly rounded at apex, labium entire or with indication of median sinus.

Carina of pronotum basal, laterally flexed forward to middle in an even arc ; no basal lateral longitudinal carinula. Elytra cylindrical, basal margin very slightly incurved from shoulder to shoulder. Prosternum much shorter in front of coxa than coxa is broad. Mesosternal process broader than coxa. Hind-femur reaching to or to near apex of abdomen. Tarsal segment I about as long as II to IV together or somewhat shorter ; tooth of claw median.——Genotype : *H. mameti* sp. nov.

3. **Heniocera mameti** sp. nov.

♂♀. Rufescent brown (♂) or pale rufous (♀, perhaps immature), pubescence white, upperside with brown markings, which are more or less diffuse, giving the upperside a velvety appearance. On frons a brown band between eyes, occiput brown, except along eyes ; frons in ♂ a little narrower, in ♀ a little broader than half the rostrum. Antenna pitchy black, a little shorter and broader in ♀ than in ♂, segment IX about one-half longer than broad.

Pronotum a trifle broader than long, apical margin rounded-produced, on disc laterally more strongly convex than medianly, slightly depressed along carina, coarsely umbilicate-punctate, as is head, raised posterior edges of punctures more or less coalescing into transverse or oblique ridges ; on side of disc a large brown patch anteriorly joined to an apical marginal transverse patch which is divided by a thin white median line, posteriorly half-way between disc and centre the brown lateral patch invaded from carina forward by a white patch which is rounded anteriorly, the brown colouring separating it from grey median area diffuse. Scutellum white.

Elytra one-third longer than broad, very feebly rounded at sides, evenly convex from side to side, slightly depressed behind basal margin, minutely granulose, with a feeble indication of a subbasal swelling, punctate-striate, but furrows dorsally very slight apart from sutural line, punctures fairly large at side ; pubescence slightly buff, a semicircle around subbasal swelling purer white, on swelling a diffuse brown patch, another patch on shoulder angle, centrally darker, a very large patch in middle from interspace III to IX connected with shoulder patch, a fourth on apical declivity also large, triangular, touching neither suture nor margins, separated from median patch by a transverse white band angulate backwards in interspace VII. Pygidium coarsely punctate-rugate, white pubescence not dense ; in ♂ a little broader than long, not much narrowed to apex, subtruncate, angles raised each into a sharply pointed blackish tooth directed backwards ; in ♀ semicircular.

Underside pale rufous, side of prosternum brown ; throat coarsely and densely punctate ; punctures of prosternum very large, but not close together ; metasternite laterally with dispersed punctures. Abdomen with one row of punctures on segment I ; in ♂ middle flattened-depressed from base to apex, flattened area gradually widening, bounded each side by a carina, which disappears towards base of abdomen. Legs pale rufous, feebly brownish at knees, extreme tip of tibiae and claw.

Length : ♂ 3·3 mm., ♀ 3·0 mm.

Le Pouce, 2.xi.32 (Ray. Mamet), one pair.

4. **Heniocera sericea** sp. nov. (text-fig. 37).

♂♀. In colouring very close to the preceding species: derm brown, deeper in tint than in *H. mameti*, rostrum and head grey; on pronotum apical transverse patch much narrower, lateral one deeper black, not invaded from behind by white, but dorsally incised in middle, centre of pronotum with black spot; white pubescence of elytra not obviously concentrated behind feeble subbasal swelling, brown lateral median patch reduced to its posterior portion, which is rounded behind and anteriorly fades away, subapical patch rounded, transverse white band produced forward between lines of punctures II and IV, on suture before apical declivity a diffuse blackish spot; pygidium grey; tarsi blackish, except base of segment I.

Sinus of apical margin of rostrum deeper than in *M. mameti*. Frons in ♂ about one-fourth as broad as rostrum, in ♀ a little broader than one-third the rostrum. Antenna broader distally, segment III longer, IV much narrower (too short in figure), V and VI also somewhat narrower than in *M. mameti*, IX only as long as broad.

Prothorax distinctly shorter, being about one-fourth broader than long, carina flexed forward in a less even curve. Pygidium in both sexes broader than long and rounded at apex. Abdomen of ♂ slightly flattened in middle. Legs pale rufous, middle of femora blackish.

Length: ♂ 3·6 mm., ♀ 4·5 mm.

Corps de Garde, 10.xiii.32, 21.i.34 (Ray. Mamet), one pair.

Nesidobius gen. nov.

♂♀. Close to *Heniocera*, but antenna normal in both sexes.

Rostrum short, flat, apex sinuate; labium truncate, with slight emargination. Antenna short, segment III longer than II, club distinct, IX triangular, longer than III and XI. Antennal groove rounded, covered by a moderately developed cariniform upper margin. Eye lateral-subdorsal, sinuate, finely granulate, close to antennal groove, but separated from it by a narrow interspace (text-figs. 38, 39). Dorsal carina of pronotum basal, laterally curved forward to middle, angle effaced, no subbasal, lateral, longitudinal carinula (text-fig. 40). Basal margin of elytra incurved from shoulder to shoulder. Legs short, hind-femur not reaching end of abdomen.——Genotype: *N. vinsoni* sp. nov.

Here also belongs *Hormiscops thomasseti* Jord., Nov. Zool., xxxi, p. 227, no. 2 (1924) (Rodriguez).

5. **Nesidobius vinsoni** sp. nov. (text-figs. 38, 39, 40)

♂♀. Largest species known of this genus. Club of antenna loose, narrow, X longer than XI. Rufescent brown, densely pubescent white, on upperside partly tinted with buff and marked with a few brown patches. Rostrum flat, depressed at base, white like head, not quite twice as broad as long (20 : 11). Frons as broad as rostrum is long, slightly convex in middle. Antenna rufous, reaching to base of pronotum (with head stretched obliquely forward), very little longer in ♂ than in ♀, II rounded, about one-third longer than broad, III to VIII gradually decreasing in length, VIII in ♂ nearly two-thirds and in ♀ one-half III, club brownish, IX somewhat longer than III, triangular, in ♂ nearly thrice and in ♀ twice as long as broad, X shorter, also triangular, XI a little shorter than X, elliptical. Labium entire.

Pronotum about one-eighth broader than long (text-fig. 38), broadest behind apex of lateral carina, twice as broad as occiput behind eyes, depressed along carina and a little constricted behind apical margin, slightly flattened before scutellum, transverse middle area strongly convex; coriaceous, with well-separated umbilicate punctures, each bearing a short stiff black hair appressed to the derm; between middle and side from carina forward a brown patch, longer than broad, more or less diffuse, the two patches together about as broad as the space between them; carina flexed forward in a wide arc, but lateral arm incurved, especially if viewed from above.

Elytra cylindrical, with the subbasal swelling and depression behind it indicated, rows of punctures gradually obsolete posteriorly, apex more strongly declivous in ♂ than in ♀, in ♂ a diffuse, indistinct, brown dorsal patch behind middle and a trace of another on subbasal swelling, in ♀ a brown median band across suture, widening laterally, but not reaching margin, not sharply defined, from its anterior lateral angle to margin below shoulder some brown pubescence, at suture the band about as wide as the white basal median area of pronotum, laterally before apex an irregularly triangular brown patch, in the white areas a few small brown punctures. Pygidium white; in ♂ flat, almost square, very little longer than broad, apex truncate, incurved, angles rounded; in ♀ almost semicircular, but its length more than half the width.

Forecoxa not quite contiguous; prosternum in front of coxa longer than coxa is broad; mesosternal process truncate, at apex much narrower than coxa. Abdomen of ♂ slightly flattened on segments I to IV, more strongly on V, which is truncate. Legs pale rufous, segment I of tarsi as long as II to IV together, somewhat longer in ♂, especially in foretarsus.

Length: ♂♀ 4·0–4·5 mm.

Les Mares, 25.xi.33 (J. Vinson & Ray. Mamet), one pair.

6. **Nesidobius dipholis** sp. nov.

♂♀. Cylindrical, length two and one-third times width; rufescent brown, densely pubescent white, above somewhat variegated with brown, on elytrum a brown median patch.

Head and rostrum rugate-reticulate; rostrum flat, with distinct apical sinus, width nearly twice length. Frons as broad as rostrum is long. Antenna not reaching to elytrum, pale rufous, club brown except base of IX, III to VIII gradually shorter, VIII about twice as long as broad, IX triangular, in ♂ twice as long as broad or nearly, in ♀ somewhat shorter, X a little broader than IX, only a little longer than broad, less regularly triangular than IX, XI elliptical, slightly longer than IX.

Pronotum as long as broad, widest close to apex of lateral carina, depressed along carina and strongly convex in tranverse median area, more so in ♂ than in ♀, apical area slanting downwards; coarsely and densely rugate-reticulate, centre of disc more or less brown, this area ill-defined, irregular and variable, in ♀ extending to apex, the brown colouring projecting backwards towards carina half-way between middle and side in ♂ and ♀; carina curved forward to middle in a very wide arc, the lateral arm not quite so strongly curved as the culmen of the arc; no subbasal lateral longitudinal carinula below the carina. Scutellum white.

Elytra rather more than half as long again as broad; rows of punctures

distinct to apical declivity, then obsolescent, suture and alternate interspaces with a few more or less distinct brown dots, on feebly elevate subbasal swelling an elongate brown smear, before middle an elongate sutural patch continued to near scutellum as a sutural line, from this narrow patch a faint stripe runs obliquely across subbasal swelling, behind middle a blackish patch, irregular in shape, from interspace III or IV to VI or IX, laterally more or less far extending forward, shoulder angle brownish, before apex a small brown sutural patch, indistinct in second ♂. Pygidium of ♂ flat, white, one-fifth broader than long, gradually narrowed, sides straight, apex truncate, very little emarginate, angles rounded ; in ♀ strongly rounded, somewhat shorter than broad.

Prosternum longer in front of coxa than coxa is broad ; mesosternal process truncate, broad, but narrower than midcoxa. Abdomen of ♂ depressed medianly, segment V somewhat swollen, with a deeper depression, which does not extend to apical margin, pubescence in this depression golden, at its lateral and apical edges a row of erect golden scale-hairs. Legs pale rufous ; segment I of tarsi shorter than II to IV ; hindfemur of ♂ of very much thicker than fore- and midfemora, the difference less marked in ♀.

Length : ♂♀ 2·7–3·6 mm.

Le Pouce, 2.xi.32 (Ray. Mamet), 1 ♂ ; Corps de Garde, 10.xiii.32 (J. Vinson), 1 ♂ ; Les Mares, 25.xi.33 (Ray. Mamet), 1 ♀.

7. **Nesidobius pollicis** sp. nov.

♂. Cylindrical, more than twice as long as broad, dark rufescent brown, pubescent greyish white, pronotum and elytra with diffuse grey patches.

Head and rostrum white, rugate-reticulate ; rostrum a little more than twice as broad as long, flat, with distinct apical sinus. Frons a trifle more than one-half the width of rostrum. Antenna reaching to base of pronotum, pale at base, shaft rufescent, club dark brown, segments III to VIII gradually shorter, VIII less than twice as long as broad, IX a little longer than III, triangular (in outline), one-half longer than broad, X as long as broad, one-fifth shorter than IX, less gradually narrowed to base, XI ovate, nearly as long as IX. Labium with small sinus ; lobes of labiophore very obtuse.

Pronotum as long as broad, depressed along carina and behind apical margin, otherwise very convex, strongly rugate-reticulate, disc brown, apical half with scattered greyish white pubescence, which forms a short median stripe and is denser at side ; before dorsal carina at each side nearer to lateral carina than to centre a greyish white patch widest at carina, rounded anteriorly and connected with apical area by scattered pubescence, outside this patch a fairly well-defined area without white ; carina curved forward in a broad arc to middle of side, lateral arm somewhat straightened and in dorsal aspect slightly incurved ; no lateral subbasal longitudinal carinula. Scutellum white.

Elytra greyish white, the pubescence rather sparse, condensed in a diffuse sutural patch behind scutellum and in a transverse apical patch widest at suture and quite narrow at side, derm of apical margin rufous, the following areas devoid of greyish white ; one on feebly elevate subbasal swelling, another on shoulder angle, a large irregular median one between lines II and VI, and a very large patch on each elytrum in front of greyish white apical border, extending neither to suture nor to margin ; seriated punctures rather large, but obsolescent in posterior third. Pygidium greyish white, somewhat convex at base, nearly square

(♂), very little broader at base than long, truncate, apical margin incurved, angles rounded ; hypopygidium divided into two long, flat, somewhat twisted processes.

Prosternum a little longer in front of coxa than coxa is broad ; mesosternal process about as wide in middle as midcoxa. Abdomen (♂) broadly depressed from base to apex, depression of anal sternite rounded-widened, apex of this sternite swollen at side of depression. Legs rufescent, coxae and base of femora pale rufous, middle of femora brown ; segment I of tarsi shorter than II to IV.

Length : 2·9 mm.

Le Pouce, 2.xi.23 (J. Vinson), 1 ♂.

8. **Nesidobius ramulus** sp. nov. (text-fig. 42).

♂. Like *N. pollicis*, but antenna and legs paler rufous, on elytrum a broad rufous stripe in the derm from above shoulder to near suture before apical declivity, broadest anteriorly, between this stripe and lateral margin sparse white pubescence, derm of grey apex rufous, pygidium narrower, nearly one-fifth longer than broad (text-fig. 42), processes of hypopygidium broader and more obtuse.

Corps de Garde, 20.i.34 (G. Morin), 1 ♂.

9. **Nesidobius tessellatus** Bohem. 1859.

Tropideres tessellatus Boheman, *Eugenies Resa, Zool.*, p. 115, no. 244 (1859) (Mauritius).

In the strongly convex and coarsely sculptured pronotum nearest to the two preceding species, but in colouring more like *N. thomasseti* Jord. 1924 from Rodriguez. Grey pubescence less diffuse than in most specimens of *N. thomasseti* : on pronotum an apical border, abruptly narrowed laterally, its dorsal portion sinuate posteriorly each side of middle, behind each sinus a grey spot, in front of dorsal carina a large sublateral patch, grey, rounded anteriorly and extending along lateral carina as a narrow border, in brown lateral area of disc three small grey spots, anterior one largest, lateral one joined to border of lateral carina, third subdorsal, minute ; centre of base being covered with glue, it is not possible to ascertain whether there is a grey basal median patch or not ; derm much more coarsely rugate than in *N. thomasseti*, pale rufous at apical margin. Seriated punctures of elytra larger than in *N. thomasseti*, grey pubescence forming four longitudinal rows of spots, there being in addition some small sutural dots ; in middle of each elytrum a small space bare of grey, but of the same rufescent colour as rest of derm of elytra ; apical edge pale rufous. Legs pale rufous, about apical half of femora, extreme tip of tibiae and of tarsal segment I and the whole of segments II to IV more or less brown, as in *N. thomasseti*. As far as I can judge from what is visible of end of abdomen, the specimen is a ♂, but club of antenna shorter than in *N. thomasseti* ♂, agreeing with ♀ of that species.

Monosirhapis gen. nov.

♂♀. Like *Nesidobius*, gen. nov. ; but club of antenna more compact, segment X shorter ; pronotum less convex, angle of carina more or less distinct, below it a short longitudinal carinula (text-fig. 41) ; basal margin of elytrum slightly curved forward.——Genotype : *M. morini*, sp. nov.

10. **Monosirhapis albonigra** sp. nov.

♀. Not typical ; densely pubescent white, with large black patches on upperside. Twice as long as broad. Rostrum two and one-half times as broad

as long, transversely flattened in middle, with broad apical sinus. Frons very nearly as broad as rostrum is long, rugate-reticulate, as is occiput. Antenna rufous at base, VIII less than twice as long as broad, club compact, broad, IX longer than III, half as long again as broad, X as long as broad, almost square. Labium without distinct sinus.

Pronotum one-sixth broader than long, rounded-angustate frontad, coarsely rugate-reticulate, except medianly at apex, transversely convex, depressed along carina, three large black patches, sharply defined, but irregular and variable, reaching neither apical margin nor carina, median one elongate, widest anteriorly, usually with an indication of a black spot behind it ; dorsal carina curved forward in a somewhat uneven arc to middle, there being a very feeble indication of a strongly rounded-off angle, below which a short black longitudinal carinula.

Elytra cylindrical, with the rows of punctures obsolescent dorsally and apically, better marked at sides ; each elytrum with four variable black markings : a round spot on very feebly raised subbasal swelling, a larger one on shoulder angle, a large patch in middle from about third row of punctures to or to near margin, and a large round spot before apex. Pygidium white, broader than long, strongly rounded at apex.

Underside uniformly white. Femora at base or on inner surface, extreme tip of tibiae, and tarsal segments II to IV more or less devoid of white pubescence. Forecoxae well separated. Mesosternal process broader than coxa.

Length : ♀ 4·8–5·3 mm.

Corps de Garde, 21.i.34 (J. Vinson & Ray. Mamet), 3 ♀♀.

Tropideres tessellatus Coquerel, *Ann. Soc. Ent. France*, 1866, pl. 7, fig. 5 (no description), from Réunion, nec *Tropideres tessellatus* Bohem. 1859, from Mauritius, and therefore renamed *T. coquereli* Fairm. 1880, apparently is a similar species and probably belongs to this genus and not to *Basitropis* Jekel 1855 where Fairmaire placed it.

11. **Monosirhapis adelpha** sp. nov.

♂. Similar to *Nesidobius tessellatus* Bohem. (cf. no. 9), but pronotal carina with a distinct though obtuse lateral angle, below which there is a longitudinal carinula, disc much less convex, and behind rufous apical margin of pronotum a transverse grey band.

Rufescent brown, pubescent greyish white, spotted with brown on upperside. Head and rostrum greyish white, coarsely punctate-rugate, twice as broad as long, apical margin very distinctly sinuate in middle. Frons a little more than half the width of rostrum. Eye sinuate. Shaft of antenna rufescent, club blackish, segment III not quite so long as VII + VIII, VIII about twice as long as broad, IX triangular, somewhat longer than III, X rounded basally, as long as broad, XI ovate, one-third longer than broad.

Pronotum one-sixth broader than long, rather strongly rounded-angustate from end of lateral carina forward, rugate-granulate, convex transversely, depressed along dorsal carina, greyish white subapical band laterally widened to apical margin, disc more extended rufous than greyish white, with variable black smears, one in centre and two or three each side, greyish white pubescence condensed along carina into a short median stripe and half-way to side into a patch variable in extent. Scutellum white.

Elytra two-thirds longer than pronotum, cylindrical, sides somewhat rounded, rows of punctures distinct in anterior two-thirds, small and shallow on

apical declivous area, greyish white pubescence concentrated at base above shoulder, between subbasal swellings, on apical declivous area and from there forward between rows V and VII : subbasal swelling, a median patch across suture, usually more or less deeply incised on suture, and lateral margin dark brown. Pygidium white, convex, one-fourth broader than long, strongly rounded.

Underside white. Abdomen medianly somewhat flattened (♂), segments II to IV short, especially IV, pygidium therefore leaning forward. Legs rufous, middle of femora, knees, tip of tibiae and the tarsi except base more or less dark brown. Procoxae well separated ; mesosternal process rounded-truncate, in middle somewhat broader than coxa. Abdomen impunctate except for a basal row of punctures on segment I ; metasternite with scattered punctures on side.

Length : ♂ 2·7–3·0 mm.

Le Pouce, 2.xi.32 (J. Vinson), 1 ♂ ; Les Mares, 25.xi.31, and Corps de Garde, 10.xii.32 (Ray. Mamet), 4 ♂♂.

12. **Monosirhapis morini** sp. nov. (text-fig. 41).

♂♀. Like the preceding *M. adelpha*, but narrower, pronotum more extended dark brown, elytra more extended greyish white, with a large dark-brown median patch from side to interspace II or III, and before apex with a transverse dark-brown band widest at suture and narrow laterally. Pygidium shorter.

Corps de Garde, 20.x.32 (J. Vinson), 1 ♀ ; ibid., 10.xii.32 (Ray. Mamet), 2 ♂♂ and 21.i.34 (G. Morin), 1 ♂.

The species of *Hormiscops* Jord. 1914, from the Seychelles, are similar in appearance to nos. 11 and 12 ; but that genus differs in the rostrum having no apical sinus, the labium being deeply divided, the eye coarsely granulate, more dorsal and less distinctly sinuate, the club of antenna loose, the transverse carinula of pronotum, between dorsal carina and edge of foramen, more dorsal, laterally adjoining dorsal carina, whereas in *Monosirhapis* this carinula is remote from dorsal carina (text-fig. 41), etc.

Dinephrius Jord. 1924.

♂♀. Eye sinuate (text-fig. 43), frons flat in both sexes, at most one-third broader at narrowest point than distance between antennal grooves, which are small, without a distinct elevated rim, and close to eye. Close to *Caranistes* Schönh. 1835. Known from Rodriguez (*D. annulipes* Waterh. 1876) and occurring probably on Réunion (*Caranistes dionysius* Coquer. 1866).

A. Frons much narrower than interspace of antennal grooves (text-fig. 43).

13. **Dinephrius dorsatus** Fairm. (1901) (text-fig. 43).

♂ ?. *Caranistes dorsatus* Fairm., *Rev. d'Entom.*, xx, p. 203 (1901) (Mauritius).
♂. *Dinephrius mauritius* Jord., *Nov. Zool.*, xxxi, p. 228 (1924) (Mauritius).

The series before me leaves no doubt in my mind that *D. mauritius* is a synonym of *D. dorsatus*. As Fairmaire described the eye merely as being large, without mentioning the very distinct sinus, I redescribed the species from a rather worn old specimen. There are two colour forms : in most specimens there is a broad pale rufous stripe, varying individually, running from base of elytrum above shoulder to apical declivity, in other specimens this diffuse stripe missing. Dorsal grey area of upperside variable, sometimes broken up into spots on

pronotum, on elytra usually constricted in middle and before apex, sometimes almost interrupted.

Frons in both sexes much narrower than space between antennal grooves. Segment VII of antenna longer than IX. Pronotum strongly impressed in middle before carina, centre of impression somewhat raised. Pygidium in ♂ a little shorter than broad, sides rounded towards apex, apex medianly truncate-emarginate ; in ♀ longer than broad, acuminate, medianly strongly convex before apex.

Forest Side, 10.xi.32 (Ray. Mamet), 1 ♂, 1 ♀ ; Les Mares, 11.iii.32, 15.xi.33 and Candos, 20.xi.32 (J. Vinson), 3 ♀♀ ; Le Pouce, 2.xi.32 (Ray. Mamet), 1 ♀.

B. Frons about as broad as or broader than space between antennal grooves.

14. **Dinephrius saphis** sp. nov.

♂♀. Frons about one-third broader than interspace of antennal grooves. Segment VII of antenna shorter than IX. Suture rufescent to middle.

Pubescence greyish white, forming a diffuse cross on middle of pronotum, on elytra of ♂ large and small irregular patches, and in ♀ covering the whole elytra apart from the rufescent sutural stripe, which varies in width.

Pronotum three-fifths broader than long, coarsely rugate-subreticulate, ridges more or less sharp ; depression along carina not deeper in middle than at side ; carina more evenly and strongly curved forward at side than in *D. dorsatus*. Elytra half as long again as broad, shorter than in *D. dorsatus*, less impressed before middle, subbasal swelling less pronounced, granulation rather stronger, rufescent sutural stripe from base to middle, constricted in antemedian depression, truncate. Pygidium of ♂ evenly rounded, not truncate, not subtriangular ; in ♀ acuminate as in ♀ of *D. dorsatus*, but less convex and broader than long.

Underside densely greyish white ; abdomen of ♂ slightly flattened in middle. Legs pale rufous in ♀, darker brown in ♂, two spots on tibiae and, in ♂, one on tarsal segment I brown.

Length : ♂ 3·3 mm., ♀ 3·9 mm. ; width : ♂ 1·5, ♀ 1·8 mm.

Le Pouce, 2.xi.32 (J. Vinson & Ray. Mamet), 1 ♂ (type), 3 ♀♀.

15. **Dinephrius candidus** sp. nov.

♀. Broader than the two preceding species, pitchy black and white. Frons one-third broader than interspace of antennal grooves ; rostrum and frons white, occiput medianly more or less extended black. Antenna pitchy black, shaft rufescent, length of segments II to XI : 22, 12, 12, 9, 10, 5, 8, 13, 11, 14, IX twice as long as broad.

Pronotum three-fifths broader than long, coarse structure of derm and depression along carina as in *D. saphis*, much more convex in middle than in that species, a large central area black, with sparse white pubescence and an ill-defined white cross ; carina not quite so evenly curved at side as in *D. saphis*.

Elytra only two-fifths longer than broad, subbasal swelling and depression behind it more pronounced than in *D. saphis*, from base to middle a black sutural patch corresponding to the rufescent patch of *D. saphis*, constricted in antemedian depression, before apical declivity a large black lateral patch, irregular, extending dorsad to interspace III or IV and sending a projection towards suture, which it does not reach. Pygidium white.

Underside white ; metasternite with lateral patch devoid of white. Basal half of femora pale rufous, a submedian and an apical patch on tibiae, apex of segment I of tarsi and entire segments II to IV black except claw, which is rufous.

Length : 4·2 mm.

Le Pouce, 1.x.33 (Ray. Mamet), 2 ♀♀.

16. **Dinephrius lenis** sp. nov.

♂♀. Distinguished from all the other species of this genus by the velvety appearance of the upper side, recalling the two species of *Heniocera* (cf. nos. 3 and 4).

Rufescent brown, pubescence of pronotum and elytra short and, especially on elytra, changing into grey in a view from front or above, as if a powder puff had been applied. Rostrum white to above antennal grooves in ♂, sharply cut off, there being a dark chocolate band between antennal grooves, in ♀ the white extending to antennal grooves, there being a creamy buff spot at eye (absent in one specimen). Frons dark chocolate ; occiput creamy buff at side, the two patches sometimes connected by creamy buff pubescence ; frons in ♂ one-ninth, in ♀ one-third broader than interspace of antennal grooves. Antenna pitchy black, base rufescent, length of segments III to XI : in ♂ 19, 10, 11, 9, 10, 7, 11, 9, 11, IX not quite thrice as long as broad, triangular ; in ♀ almost the same, except that VIII is a little shorter and club a little broader.

Pronotum from two-thirds to three-fourths as long as broad, broadest close to base at point of strongest curvature of carina, almost gradually narrowed to apex, flattened-depressed along carina, especially in middle, not depressed at apex, coarsely rugate, ridges sharp, apex bordered each side with creamy white, dorsal carina bordered in front and behind by the same but shorter pubescence to near lateral angle, a little nearer middle than side a broad, anteriorly rounded, projection from border of carina forward not quite to middle, between this lobe and apical border some pale brown pubescence, in one ♀ the apical border and basal lobe completely joined together and the apical border broader and extending from side to side, not being broadly interrupted medianly, disc and a large lateral patch dark chocolate, the lateral patch almost black, extending on to prosternum, in centre from carina forward a short pale stripe in one ♀ ; carina feebly concave from side to side, lateral arc short.

Scutellum white, broader than long. Elytra one-third longer than broad, punctate-striate to apex, subbasal swelling and depression behind it almost effaced, general colour pale chocolate, scale-hairs short, broadish at base and rather abruptly narrowed, ending with a long sharp point, from scutellum around subbasal swelling to base above shoulder a narrow white festoon, to which is joined a broader loop around shoulder, in front of apical declivity a white transverse band from side or from near side to interspace V, here projecting forward and continued obliquely backward to suture and running around apical declivous area, lateral margin usually shaded with white, these markings somewhat diffuse and in one ♀ the basal festoons incomplete. Pygidium white ; in ♂ nearly as long as broad, gradually rounded-narrowed, apex rounded ; in ♀ much broader than long, rounded-acuminate.

Foretibia and -tarsus broadened, black or nearly, mid- and hindlegs dark brown or more or less rufous, tibiae and tarsi grey, with brown subbasal and apical spots on tibiae distinct or indicated.

Length: ♂ 3·2 mm.; ♀ 3·7–4·0 mm.

Forest Side, 28.x.33 (J. Vinson & Ray. Mamet), 1 ♂, 2 ♀♀; Le Pouce, 2.vi.32 (J. Vinson), 1 ♀. The ♀ from Le Pouce is the one with more white on pronotum and the festoons of elytra incomplete.

17. **Caranistes variegatus** Bohem. 1859.

♂. *Caranistes variegatus* Boheman, *Eugenies Resa, Zool.*, p. 116, no. 245 (1859) (Mauritius).
♀. *Apolecta filicornis* Fairmaire, *Rev. d'Entom.*, xxii, p. 43 (1903) (Mauritius).

The type of *C. variegatus* is a small ♂, length (head excl.) 4 mm., which agrees very well with some of the other specimens before me.

In ♂, antennal grooves close to eye and close together, interspace of grooves only one-fifth the width of frons, strongly elevate, the height evidently varying according to size of specimen. Segment III of antenna shorter than VIII, IV shorter than V, VIII longer than IX, club slender, but flattened, broader than VIII. In ♀ space between antennal grooves half as wide as frons. Proportional length of segments III to XI:

Small ♂ (type): 29, 20, 29, 36, 34, 28, 16, 14, 16; small ♀: 26, 17, 20, 20, 20, 16, 14, 12, 14.

Large ♂: 52, 35, 47, 74, 85, 84, 31, 29, 35; large ♀: 34, 24, 29, 27, 26, 23, 19, 15, 17.

♂♀. Pronotum one-third broader than long, depressed anteriorly and posteriorly, more strongly in ♂ than in ♀, somewhat raised in median line. Elytra about three-fourths longer than broad, rather strongly convex at base, then dorsally flattened and declivous, variable in colouring, distinctly or indistinctly tessellated in alternate interspaces, or entirely grey, or with a grey triangular sutural area from middle backwards, this area sometimes banded anteriorly by a brown stripe running obliquely laterad-backward; elytra gradually narrowed, in ♂ more flattened than in ♀, recalling *Sintor* Schönh. 1839. Pygidium in ♂ broader than long, rounded at apex, in ♀ longer than broad, almost gradually narrowed to a point.

Length: ♂ 3·0–5·6 mm., ♀ 4·5–6·7 mm.

Candos, 30.xi.32 (J. Vinson), 3 ♂♂, 1 ♀; Moka, xi.32 and 25.xi.33 (J. Vinson), 2 ♀♀; Le Pouce, xi.33 (Ray. Mamet), 1 ♀.

In Dejean, *Cat. Col.*, ed. iii, p. 234 (1834), appears the new generic name *Leptonemus*, with four specific names, all five names undescribed, only the locality Mauritius being given. The names are not valid. In 1866, Lacordaire, *Gen. Col.*, vii, p. 555, quotes *Leptonemus* Dejean as a synonym of *Apolecta* Pascoe 1860, and thereby renders it available as from 1866. This *Apolecta* as described by Lacordaire is a wider concept than Pascoe's, which was erected for Oriental species only, whereas Lacordaire includes Mauritius in the area of distribution of *Apolecta*. As Lacordaire quotes Dejean, the synonym *Leptonemus* is not congruent with *Apolecta* Pasc., but applies to a portion of it, comprising undescribed species from Mauritius. Lacordaire does not refer to a Mauritian species by name; I supply the want by assigning to *Leptonemus* Lacord. 1866 (ex Dejean, *Cat.*) as genotype *Apolecta filicornis* Fairm. 1903 (ex Dejean, *Cat.*). I do not see any reason for separating *Leptonemus* from *Caranistes* Schönh. 1839. *Palazia* Coquer. 1866, indescr., is another synonym, spelt *Salazia* by Fairmaire in *Ann. Soc. Ent. France*, 1903, p. 247 (under *Protomerus*).

18. **Caranistes firmus** sp. nov.

♂♀. Much more robust than *C. variegatus* Bohem. A little more than twice as long as broad (pygidium included). Rufescent brown, pubescence raw-umber brown shaded with grey. Head and rostrum buffish grey ; rostrum flat, somewhat uneven ; frons twice in ♂, one-half in ♀ as broad as space between antennal grooves, this interspace less elevate than in *C. variegatus*, with median channel. Antenna rather stout in ♂, length of segments III to XI : in ♂ 45, 58, 65, 70, 75, 68, 35, 30, 36 ; in ♀ 57, 43, 48, 44, 43, 42, 34, 29, 33.

Pronotum seven-tenths broader than long, conical, very strongly rugate, especially at side, with four wide shallow depressions before carina almost equidistant, apical area slightly depressed behind margin, median area from apex to base more or less shaded with grey, half-way to side an indication of a greyish stripe, laterally of this a whitish median dot, base behind carina whitish in middle and towards side ; dorsal carina nearly evenly curved from side to side, rather strongly projecting sidewards, the lateral arm oblique, straightened, the thorax appearing in dorsal aspect here slightly constricted. Scutellum grey, transverse.

Elytra punctate-striate, less convex at base than in *C. variegatus*, interspaces but feebly convex, suture somewhat depressed at base and posteriorly flattened ; at side of scutellum a small transverse basal spot black, another black spot on shoulder angle, basal area greyish, particularly if viewed from front, in ♀ sutural area and apex also shaded with grey, very feebly contrasting with lateral area (recalling *Dinephrius dorsatus*, but the grey colouring less pronounced) ; in ♂ stripes II, IV, etc., greyish, in III, V, etc., some short grey dashes behind base and before apical declivity; in ♀ the alternate interspaces not different in colouring, the elytra not appearing striped, all interspaces bearing some small blackish spots, particularly before middle. Pygidium shorter than in *C. variegatus*, grey, with a narrow lateral brown border at base.

Legs grey, a subapical spot on femora, a large median one on tibiae and on tarsal segment I, and entire segment II dark brown, claw-segment pale rufous.

Length : ♂ 8·3 mm., ♂ 11 mm.

Forest Side, 17.i.34 (J. Vinson & Ray. Mamet), 1 ♂, 1 ♀.

Caranistes aranea Coquerel (1866, as *Palazia*) is perhaps its nearest ally.

19. **Caranistes arboreus** sp. nov.

♂♀. Similar to small specimens of *C. variegatus*, but antennal groove not so close to eye, space between grooves broader and in ♂ much less elevate, elytra parallel, posteriorly not flattened, therefore apex more strongly convex, pygidium broader, etc.

Rufescent brown to pale rufous (immature ?), pubescence greyish white, not dense, much variegated with brown. Frons in ♂ about thrice as broad as, in ♀ three-fifths broader than space between antennal grooves. Antenna shorter than in *C. variegatus*, more or less pale rufous, segment I and club darkened, length of II to XI : in ♂ 26, 20, 20, 21, 23, 21, 20, 20, 18 ; in ♀ 19, 15, 13, 10, 10, 9, 13, 12, 14 ; XI curved in ♂♀, subacuminate, not drawn out into a long point.

Pronotum not quite half as broad again as long (18 : 13), flattened, with four shallow depressions, two in front and two behind, interspaces forming a slightly raised cross, highest point in centre ; umbilicate punctures close together, their raised edges forming ridges, especially laterally, derm partly or almost entirely

rufous, on disc a transverse row of three brown spots or patches on highest points, the lateral one bearing a conspicuous greyish white dot ; dorsal carina somewhat convex before curving downward-forward. Scutellum white, broader than long, subacuminate when denuded.

Elytra a little less than half as long again as broad (13 : 9), parallel, cylindrical, fairly strongly punctate-striate, interspaces somewhat convex, basal margins together slightly incurved, subbasal swelling distinct, derm pale rufous above shoulder and usually backwards to or beyond middle, pubescence much variegated, on the whole more extended grey than brown, here and there a little more concentrated, particularly before and behind middle and at apex, without definite grey spots being formed, a brown spot on subbasal swelling. Pygidium grey ; in ♂ not visible from above if in natural position, as broad as long, broadly rounded at apex, sides but slightly converging ; in ♀ very little longer than broad, acuminate, sides rather strongly rounded in apical half.

Legs varying in the series from dark rufescent brown to very pale rufous, femora with brown subapical ring, in dark-coloured tibiae base and tip remaining pale, tarsi brown, apex of segment I and the claw pale.

Length : ♂ 3·0–3·8 mm., ♀ 4·2–4·5 mm.

Length : ♂ 3·0–3·8 mm., ♀ 4·2–4·5 mm.

Le Pouce, 2.x.33 (J. Vinson & Ray. Mamet), 4 ♂♂, 1 ♀. Also a pair received from Director of Forests, bred 1.iv.30 from *Terminalia arjuna*.

Gomphides gen. nov.

♀. Cylindrical. Rostrum more than twice as broad as long, truncate ; mandible with prominent tooth near tip (text-fig. 46) ; labium entire, with some stiff hairs ; labiophore deeply and broadly sinuate, the lobes obtuse and strongly divergent ; buccal sinus very broad. Antenna reaching to base of pronotum, segments I and II thicker than III to VIII, II longer than I, as long as III+IV, club-shaped, two and one-half times as long as broad, III to VIII short, club broad, not quite compact, nearly as long as II to V together, IX triangular, X broader than long, almost trapeziform, shorter than IX, XI strongly rounded, slightly broader than X, a little longer than broad. Antennal groove dorsal, small above, becoming wider and shallower downwards, close to eye, which is circular in outline and coarsely granulose ; antennal grooves as far distant from each other as the eyes.

Pronotum densely reticulate, as is head ; carina basal, feebly, but quite regularly concave, subbasal at side, curving away from shoulder and disappearing in middle of side, angle very obtuse and strongly rounded ; no longitudinal carinule below angle. Subbasal swelling of elytra but faintly indicated, sides parallel. Pygidium almost semicircular (♀).

Prosternum somewhat shorter before coxa than coxa is broad ; mesosternal process triangular, almost pointed. Legs short, hindfemur not reaching to apex of abdomen ; tarsi short ; tooth of claw subbasal, long.

One species, represented by a single specimen. Allied to *Araecerus* Schönh. 1826.

20. **Gomphides entornus** sp. nov. (text-figs. 44, 45, 46).

♀. Length twice width in dorsal aspect, about as strongly convex below as above. Pitchy black, glossy ; upperside with scattered white pubescence, in

between which minute dark hairs, the white hairs resembling a short grass-blade with a long point, those of underside narrower. Mouth-parts and antenna pale rufous.

Pronotum (text-fig. 44) rounded-angustate from near base to apex, almost conical, a very trifle broader than long (17 : 16), evenly convex, very slightly depressed along dorsal carina ; the following patches bare of white hairs : a subapical patch each side connected with a large central area, a smaller lateral patch and a large antescutellar one which extends forward to middle (text-fig. 45). Scutellum very little broader than long.

Elytra three-fifths longer than broad, nearly twice as long as pronotum (bent-down apical portion not visible in dorsal aspect, text-fig. 44), with rows of large punctures, most of which become obsolete towards apex, on each elytrum a shoulder patch, a large lateral median area and a large anteapical area devoid of white, all ill-defined and connected with one another, behind shoulder and farther dorsal before middle a slightly more conspicuous white spot. Pygidium white, with the blade-hairs not very close together, one-half broader than long.

Prosternum coarsely punctate-reticulate ; metasternite with few large punctures ; abdomen minutely coriaceous, segment V more distinctly so, all segments with a basal row of punctures. Legs rufescent brown ; segment I in fore- and midtarsus about as long as II + III, in hindtarsus longer.

Length : 2·0 mm.

Le Pouce, 2.xi.32 (Ray. Mamet), 1 ♀.

Icospermus gen. nov.

♂♀. Ovate, strongly convex above and below (text-fig. 48). Rostrum quite short (text-fig. 47), thrice as broad as long, apical margin emarginate-truncate, the lateral angle somewhat receding ; frons and rostrum in a plane ; mandible with tooth close to apex ; labium divided ; lobes of labiophore obtuse, sinus between them about 90° ; buccal sinus broad. Antennal groove subdorsal, in front of eye, not above it, its upper margin somewhat cariniform ; no interspace between eye and groove. Eye coarsely granulate, lateral in ♀, subdorsal in ♂, with very small sinus towards antennal groove. Antenna short, not reaching beyond base of pronotum, segments I and II thicker than following, II nearly as long as I, somewhat abruptly widened at base, slightly narrowed at apex, as long as III + IV, III to VIII short, club loose as in *Araecerus* Schönh. 1826, symmetrical.

Pronotum like head densely reticulate, convex, one-third broader than long, strongly narrowed frontad, widest at base, dorsal carina basal, concave in middle, convex at side, following the curve of basal margin of elytra and shoulder, angle very acute (text-figs. 47, 48), lateral carina extending to or beyond middle, gradually thinner, disappearing in the rough texture of derm. Scutellum minute, about as broad as long.

Elytra more than twice as long as pronotum, strongly convex, not depressed at suture, coarsely punctate-striate from base to apex, interspaces granulate, basal margins together concave, convex laterally, the shoulder receding. Pygidium rotundate, longer in ♂ than in ♀, in ♀ with large subbasal groove the edges of which are raised (text-fig. 49), the groove vestigial in ♂.

Prosternum very short in front of coxa ; mesosternal process truncate, narrower than coxa ; metasternum short between mid- and hindcoxae, in ♀ as long as midcoxal cavity is broad, in ♂ somewhat longer. Legs short, hindfemur

not reaching to end of abdomen ; segment I of foretarsus shorter than II to IV in ♂♀, tooth of claw subbasal, large.

One species. Although the antennal groove is more lateral than in *Araecerus*, the new genus belongs to its neighbourhood, as shown by the almost bifid mandible, the club of the antenna and the surface structure.

21. **Icospermus ovatus** sp. nov. (text-figs. 47, 48, 49).

♂♀. Rufous brown, antenna and legs pale rufous ; pubescence grey, scattered, forming ill-defined patches and spots on upperside, the hairs similar to grass-blades.

Frons in ♂ two-fifths, in ♀ nearly one-third the width of rostrum. Antenna very little longer in ♂ than in ♀ ; segments IX and X triangular, scarcely different in length and width, XI elliptical, a trifle longer and broader than X, twice as broad as long. Pronotum with a large basal, median, grey patch rounded in front, grey pubescence very sparse on disc, a little denser at side, apex and along carina ; basal angle produced backwards, contiguous with rounded shoulder. On elytra numerous, more or less diffuse, grey spots and dashes, with specks in between, a transverse median area, a postmedian one and a subspical patch grey, all three across suture. Pygidium of ♂ one-fourth broader at base than long, a short distance from apical margin two-thirds as wide as at base, sides nearly straight, apex broadly rounded ; in ♀ nearly semicircular, convex, behind basal median groove a large groove (text-fig. 49), which is smaller in one ♀.

Prosternum coarsely punctate ; metasternite with some large punctures at side and a transverse row in front and another behind. Abdominal segments with a basal row of large punctures. Mid- and hindfemora and -tibiae brownish at apex. Metasternum of ♂ flattened in middle, silky ; hypopygidium divided into two long processes.

Length : ♂♀ 2·2 mm.

Le Pouce, 2.xi.32 (Ray. Mamet), 1 ♂ (type) ; Corps de Garde, 27.xi.32 (Ray. Mamet), 1 ♀ ; and ibid., 20.v.32 (J. Vinson), 1 ♀ ; Port Louis, iv.32 (G. Morin), 1 ♀.

22. **Araecerus fasciculatus** Degeer 1775.

A. fasciculatus Deg., Vinson, *Trans. Roy. Soc. Arts & Sci. Mauritius* (C), 3, p. 188 (1935) (Mauritius).

Moka, 24.v.34, in houses (J. Vinson) ; 2 ♂♂ ; Le Pouce, 2.xi.32 (Ray. Mamet), 1 ♀.

Correction : In *Trans. Linn. Soc. Lond.* (2), xvi, *Zool.*, p. 264 (1914), I described the rostrum of **Corynaecia** as being three times as long as broad ; it should read five times as broad as long.

TWO NEW AFRICAN SYNTOMIDAE.

By DR. KARL JORDAN, F.R.S.

(With 2 text-figures.)

1. **Melisa hancocki** sp. nov. (text fig. 51).

THE two specimens here described were exhibited at the meeting of the R. Ent. Soc. Lond. on Oct. 18th, 1933, by Prof. G. D. Hale Carpenter, who mentioned the chief colour-distinctions from *Melisa diptera* Walk. 1854, but did not give a name to the species. Prof. Hale Carpenter has very kindly submitted the specimens to me for further study; they represent both sexes of a new species, which I have much pleasure in naming after its discoverer.

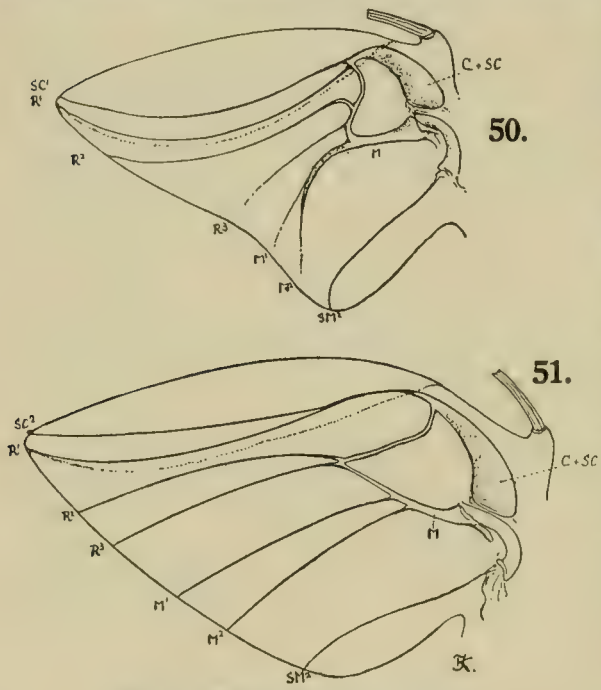


FIG. 50.—*Melisa diptera*, hindwing of ♂.
FIG. 51.—*Melisa hancocki*, hindwing of ♂.

Like the other species of the genus, glossy metallic blue. Near *M. atavistis* Hamps. 1911 in neuration; veins M^1 and M^2 of forewing not directed towards inner (= dorsal) margin as in ♂ of *M. diptera* Walk. 1854, but obliquely distad as in ♀. Differs from both *M. atavistis* and *M. diptera* in the legs being blue-black and in the dorso-lateral spots of the abdomen being quite small. Forewing beneath with a streak of semi-erect buffish brown scaling as in *M. atavistis*, and as in that species without scent-organ at tornus. Scaling at apical margin of tergite VIII of abdomen scarlet; three anterior sternites (II to IV) of abdomen reddish orange, V to VII creamy buff, VIII scarlet; behind posterior coxae a reddish orange median spot.

♀. Like ♂, but anal tuft larger and bright tawny, less scarlet than in ♂; dorso-lateral spots of abdomen absent from segments II to V, metasternum without orange spot behind coxae, forewing beneath without brown streak.

Neuration of hindwing of ♂ less distorted than in *M. diptera*. In the ♂ of *M. diptera* (text-fig. 50) the base of SC^2 swollen, SC^2 and R^1 (6 and 7) separate, cell very short, being broader than long, cross-veins incurved below R^1 and then

directed obliquely distad, lower cell angle rounded, R^2 (= 5) curved at base, originating a little below middle of cell-apex, R^3 from oblique cross-vein well above cell-angle, distally obsolete, as are also M^1 and M^2; M^1 short, stout, M^2 gradually curved down, M^1 very thin, variable, branching off from M^2 at a considerable distance from cell. In the new species neuration of ♂ hindwing (text-fig. 51) nearly as in *M. atavistis* (cf. Hampson, *Lep. Phal., Suppl.*, 1, p. 84, fig. 17, 1914), but SC^2 and R^1 on a longer stalk and M^1 and M^2 closer together. In ♀ the cell of hindwing symmetrical as in the ♀ of *M. diptera*, with a median fold, the cross-veins forming an obtuse angle, SC^2 and R^1 stalked.

Genitalia (not dissected).——♂: anal tergite very short, divided into two short, broad, divergent horns which are directed more strongly laterad than in *M. diptera* and *M. atavistis*, the sinus between the horns being largest in *M. hancocki* and smallest in *M. diptera*.——♀: sinus of antevaginal sclerite more strongly rounded than in *M. diptera*.

Uganda: Mabiri Forest and Kololo (G. L. R. Hancock), 1♂, 1♀, in the Hope Department, University Museum, Oxford.

2. **Syntomis chariessa** sp. nov.

Syntomis cerbera, Hamps., *P.Z.S.* 1910, p. 390, nec L. 1764, err. of determination.

Near *S. damarensis* Grünb. 1910, which it represents in Rhodesia.

♂♀. Frons and coxae metallic black; scaling of apical fourth of antenna pure white, of first hindtarsal segment in ♂ usually more or less white, often some white scales also on segment II of ♂, in ♀ no white scales on hindtarsus; a small lateral spot on mesonotum, the metanotum, abdominal tergites I, III, IV and V, and a large lateral patch on pro- meso- and metasternites orange.

Translucent spots of wings small. Forewing: submedian spot behind cell more than twice as long as broad, not touching vein M^2 (= 2), narrowed to a point obliquely backwards; of the three discal spots the subcostal one small or (type) absent, the other two narrower, well separated from one another; fringe entirely metallic black.——Hindwing: interspace between the two spots at least as wide as the basal spot is long, usually much wider.

Neuration: SC^1 of forewing usually stalked with the other subcostals and R^1, sometimes from cell.

Genitalia.——♂: lobe of VIII.st. short, broad, emarginate, with the angles strongly rounded. Clasper broad, with a large apical lobe and a large dorsal one, upper and lower apical angles of left clasper rounded, upper angle of right clasper acuminate; dorsal lobe of left clasper longer than that of right clasper. Harpe of right clasper quite short, that of left one recalling a soup-ladle with the handle twisted and the apical margin of the bowl excised with the angles of the excision produced into a tooth each. IX.t. with long neck, which is about as long as X.t (= uncus).——♀: orifice somewhat shifted towards left side.

N.-E. Rhodesia: Upper and Mid Loangwa valley, 1,700–2,000 ft., ii. iii. 1908 (Dr. S. A. Neave), a long series in the Hope Department.

S. cerbera L. 1764 is quite different in structure and is also easily recognised by the colouring of the thoracic sternites.

SIPHONAPTERA FROM CONGO BELGE.

BY DR. KARL JORDAN, F.R.S.

(With 7 text-figures.)

ON p. 165 of vol. xxv. of this periodical I described a new species of *Ctenophthalmus* discovered by the Mission Antipesteuse in the Belgian Congo. Further material of Siphonaptera obtained in connection with research on tropical diseases in the Congo Belge was recently received by Dr. H. Schouteden, Director of the Congo Museum at Tervueren, and kindly submitted to me for study, for which I have much pleasure in thanking him. The material consists of two collections, one from Dilolo and the other from Elizabethville, and contains a new species, a new subspecies and the hitherto unknown male of another species.

I. ELIZABETHVILLE, KATANGA.

The specimens were collected by Monsieur R. Dogot.

1. **Xenopsylla cheopis** Roths. 1903.

A series off *Rattus rattus frugivorus*; also on *Heliosciurus* spec. and on *Rattus r. alexandrinus*.

2. **Xenopsylla brasiliensis** Baker 1904.

A long series on *Rattus r. frugivorus*.——In the forest region of West Africa evidently the commonest flea on " rats " of various kinds ; the genus is but poorly

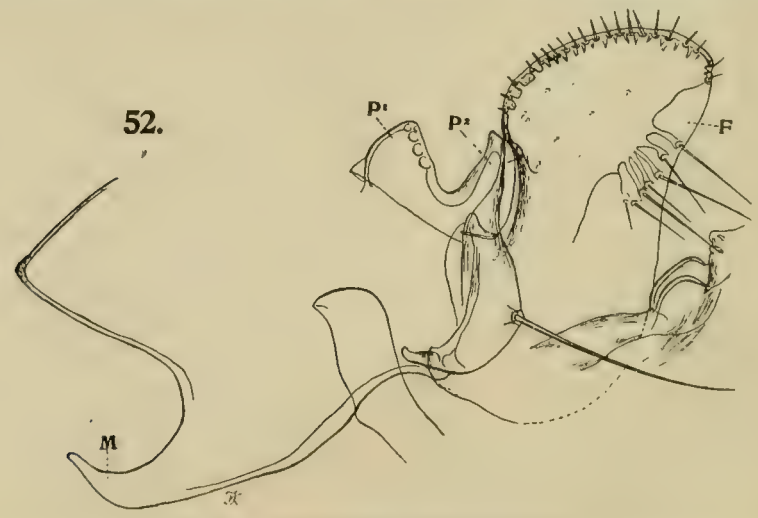


FIG. 52.—*Ctenophthalmus ansorgei catanganus* ♂.

represented in this region, whereas the species are numerous in the more open and drier countries of South and East Africa.

3. **Ctenophthalmus ansorgei catanganus** subsp. nov. (text-fig. 52).

Differs in the male only. Manubrium of clasper shorter than in *Ct. a. ansorgei* Roths. 1907, from Bihé, Angola; process P^2 longer, the apical sinus of the clasper being deeper; proximal margin of movable sclerite F more incurved, therefore the interspace between it and P^2 larger; apical portion of F less extended distad, and its dorsal margin more rounded.

A small series off *Pelomys luluae*; also on *Heliosciurus* spec.

Mons. Dogot is to be congratulated on this interesting discovery; this subspecies approaching in the genitalia the East African *Ct. cabirus* J. & R. 1913.

4. **Dinopsyllus lypusus** J. & R. 1913.

On *Rattus r. frugivorus*; also on *Heliosciurus* spec.——Common in East Africa.

II. DILOLO, NEAR FRONTIER OF ANGOLA.

The specimens collected by Dr. Richard.

1. **Echidnophaga gallinaceus** Westw. 1875.

A small series.——The species infests mammals and birds.

2. **Xenopsylla cheopis** Roths. 1903.

On *Mastomys coucha* and *Rattus rattus*.——Not so plentiful as the next.

3. **Xenopsylla brasiliensis** Baker 1904.

Evidently quite common; on *Mastomys coucha*, *Taterona valida*, *Rattus rattus*, *Lemniscomys striatus pulchellus*, *Pelomys frater*, *Steatomys pratensis*.

4. **Ctenocephalides felis strongylus** Jord. 1925.

One ♀.——Frons short and rather strongly rounded.

5. **Ctenophthalmus ansorgei ansorgei** Roths. 1907.

2 ♂♂ on *Pelomys frater*.——As we have only one ♂ of *Ct. a. ansorgei* from the original locality, Bihé, Angola, it is not possible to know whether the very small differences between this Bihé ♂ and the two from Dilolo are individual or subspecific; they may even be due to the different methods of mounting.

6. **Ctenophthalmus atomus** J. & R. 1913 (text-fig. 53).

2 ♂♂, 1 ♀ on *Pelomys frater*.——Described from a single ♀ collected by Dr. W. J. Ansorge at Ndala Tonda, Angola. The ♀ obtained by Dr. Richard agrees with it, except that the subventral lateral sinus of VII. st. is somewhat deeper; this difference, however, is evidently due to the type having been more strongly flattened by the pressure of the coverslip.

♂. The genital armature (text-fig. 53) nearest to that of *Ct. cabirus* J. & R. 1913. The dorsal portion of IX. t. shorter, projecting less forward, recalling *Ct. evidens* Jord. 1929 and *Ct. modicus* Jord. 1933. Apical margin of clasper (Cl) with a small incision imperfectly separating the apex into two very short processes: P^1 rounded and bearing 3 or 4 long bristles, there being 2 small additional

bristles in one of the specimens with 3 long ones; P^2 apically truncate and ventrally dilated into a large rounded projection, somewhat variable in size, bearing the long acetabular bristle. Movable sclerite F apically and dorsally rounded, its posterior side ventrally strongly convex (the outline indistinct in all 3 specimens) and below apex gradually and slightly concave, dorsal margin with 9 or 10 short pale spiniform bristles, on posterior side below apex 3 or 4 longish

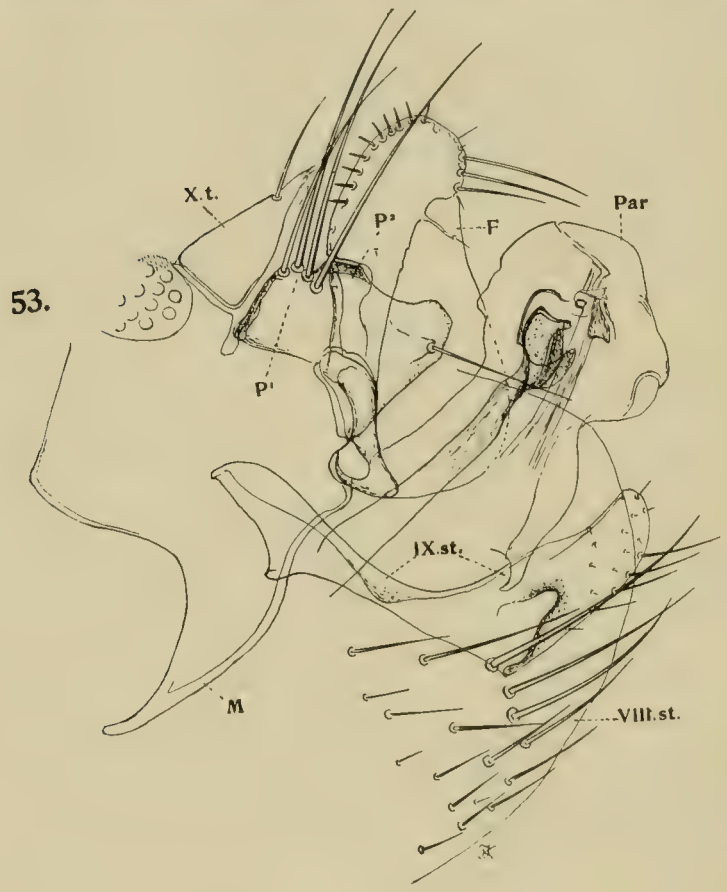


FIG. 53.—*Ctenophthalmus atomus* ♂.

bristles. Ventral, horizontal, portion of IX. st. short, somewhat variable in length, proximally broad, about 2½ times as long as broad in middle, apex very slightly curved up, at the ventral margin 4 longish, thin, bristles. Paramere rounded, internally with a short ventral hook.

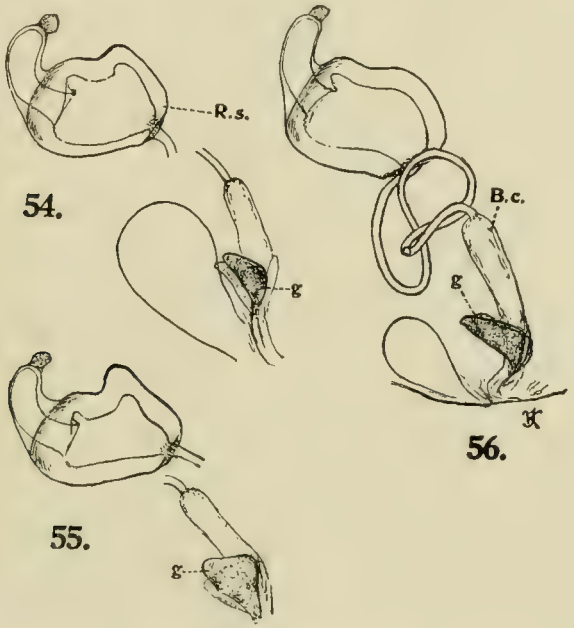
7. **Dinopsyllus lypusus** J. & R. 1913.

2 ♂♂ and a good series of ♀♀ from *Mastomys coucha, Taterona lobengulae ndolae, Lemniscomys striatus pulchellus.*——The short spines of the incomplete marginal combs of the abdomen (on segments II to V in ♂ and II to IV in ♀) are usually different in number on the two sides of the body, the numbers being

in one ♂ 2 + 3 (i.e. 2 on one side, 3 on the other), 3 + 3, 5 + 5, 1 + 0, in the other 4 + 5, 4 + 3, 3 + 6, 1 + 0 ; in the ♀ the lowest number of all these spines together being 18 and the highest 36 ; sometimes the 3 or 4 ventral spines of these combs are close together, forming a group widely separated from the next spine, in both sexes.

8. **Stivalius torvus** Roths. 1908 (text-figs. 54–56).

4 ♂♂, 4 ♀♀ off *Taterona valida* and *Mastomys coucha*.——The differences between *St. torvus* and *St. afer* Roths. 1908 mentioned in *Ectoparasites*, i, p. 252 (1922), hold good in this series, with the exception of the number of bristles. At



FIGS. 54–56.—*Stivalius torvus* ♀

that time we had only one ♀ of *St. torvus*. Now I have before me, besides the Dilolo specimens, a small series from East Africa and the Upper Congo, and in these examples the number of bristles varies considerably. In the Dilolo ♀♀ the numbers are as follows : VIII. t. above stigma, on the two sides together, 9, 13, 13, 15 ; on each side of the basal abdominal sternite 27, 31, 32, 43. The brown gland at each side of the duct of the bursa copulatrix varies in shape, but is always short (g, text-figs. 54–56). The figure of the spermatheca we gave in *Ectoparasites*, i, p. 251 (1922), represents the organ in a semidorsal aspect ; in a lateral view the dorsal outline is more convex near the duct end as well as near the tail end, but in none of the East African ♀♀ is the organ so strongly humped as in the Dilolo specimens and our Congo ♀, the differences probably being due to the degree of inflation. We figure here the spermatheca of two Dilolo specimens (text-figs. 54, 55) and, for comparison, of a ♀ from Machakos, Kenya (text-fig. 56). Similar individual differences occur in some Oriental *Stivalius*, as well as in some species of the American genus *Rhopalopsyllus* Baker.

9. **Stivalius richardi** spec. nov. (text-figs. 57, 58).

♂♀. Distinguished from *St. torvus* and *St. afer* by the tail ends. Nearest to *St. afer* Roths. 1908. Larger than both that species and *St. torvus*. Pronotal comb in ♂ and ♀ with 24 spines, as is the case of two of our three ♀♀ of *St. afer*, the comb consisting of 22 spines in both our ♂♂ of *St. afer*.

♂. Sclerite F longer and slenderer than in the allied species, its ventral

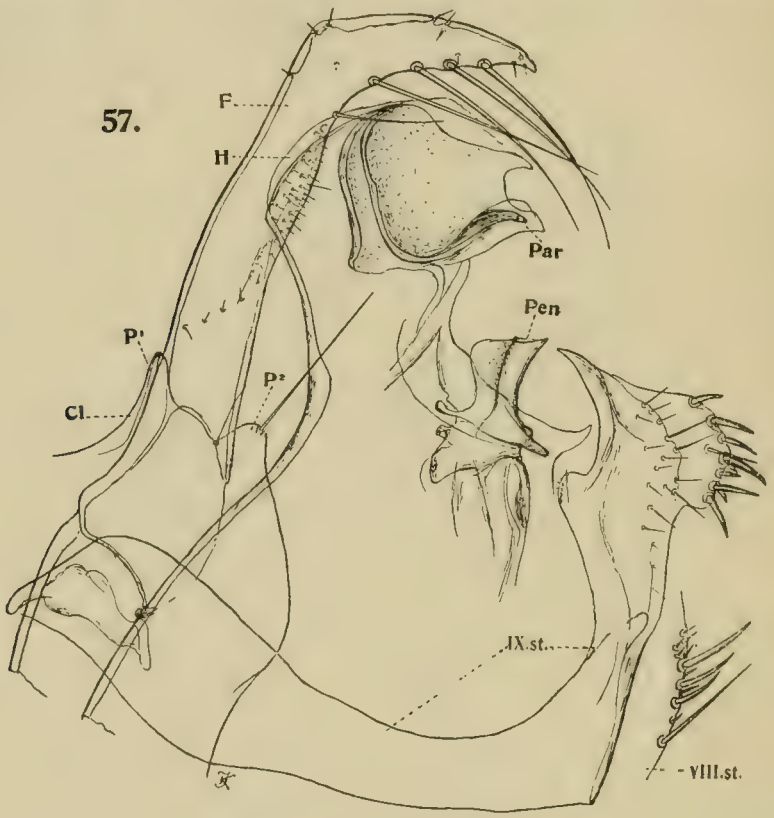


FIG. 57.—*Stivalius richardi* ♂.

margin less convex in middle. Apex of ventral arm of IX. st. acuminate, the projection curved upwards and much longer than in *St. afer* and *St. torvus*; the dorsal margin with a very distinct rounded hump bearing some minute marginal bristles. Hood (H) of paramere (Par) with upper anterior angle obtuse, not projecting forward as a hook; inner sclerite rounded dorsally in anterior half only, distal portion of dorsal margin incurved, apical margin (on each side) with two hooks, which are much closer together than in the allied species, upper hook pointed, curved down, lower one obliquely truncate. End-tube of penis (Pen) obliquely truncate, its lower apical angle acute, but not prolonged as a process; dorsal surface of tube with a rather high crest which is distally rounded (lateral aspect).

♀. Marginal angle of VII. t. below antepygidial bristles pointed. Upper lobe

of VII. st. (text-fig. 59) acuminate. Marginal projection of VIII. st. above the two apical bristles of the inner surface rounded. Spermatheca (R.s.) dorsally humped near tail and evenly convex between this hump and orifice. Gland (g)

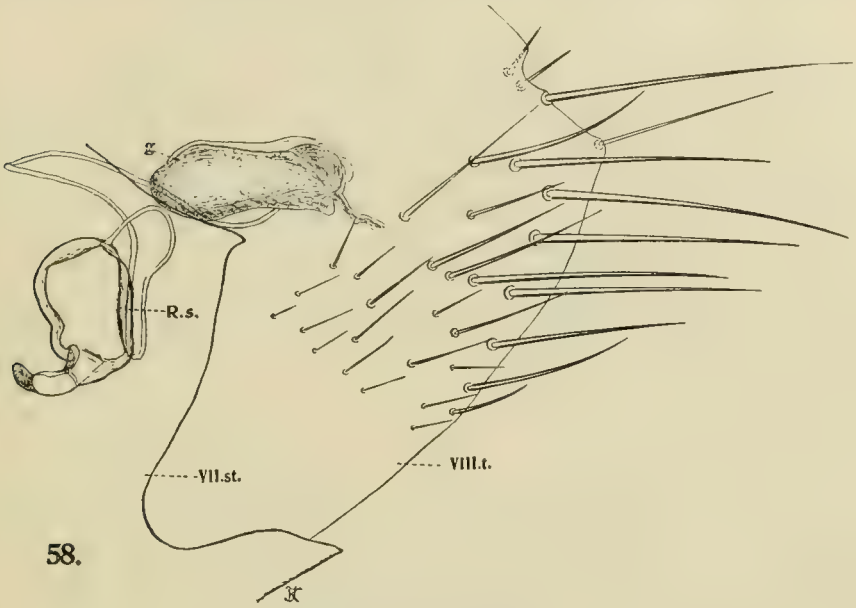


Fig. 58.—*Stivalius richardi* ♀.

at each side of bursa copulatrix very large, sole-shaped (in lateral aspect), as long as segment III of hindtarsus.

Length : ♂ 3·4 mm., hindfemur 0·27 mm. ; ♀ 4 mm., hindfemur 0·31 mm.

One ♂ (type) off *Malacomys longipes*, one ♀ off *Steatomys pratensis*.

SIPHONAPTERA FROM EAST AFRICA.

BY DR. KARL JORDAN, F.R.S.

(With 7 text-figures.)

THE specimens here dealt with were received from Mr. G. H. E. Hopkins, Entomologist to the Department of Agriculture, Kampala, to whose successful activities we owe much valuable material of Siphonaptera and who himself is keenly interested in the study of these parasites.

1. **Xenopsylla robertsi** spec. nov. (text-figs. 60, 61).

Closely related to *X. brasiliensis* Baker 1904 and *X. hamula* Jord. 1925, agreeing with the former in the chaetotaxy of the body and legs and in the shape

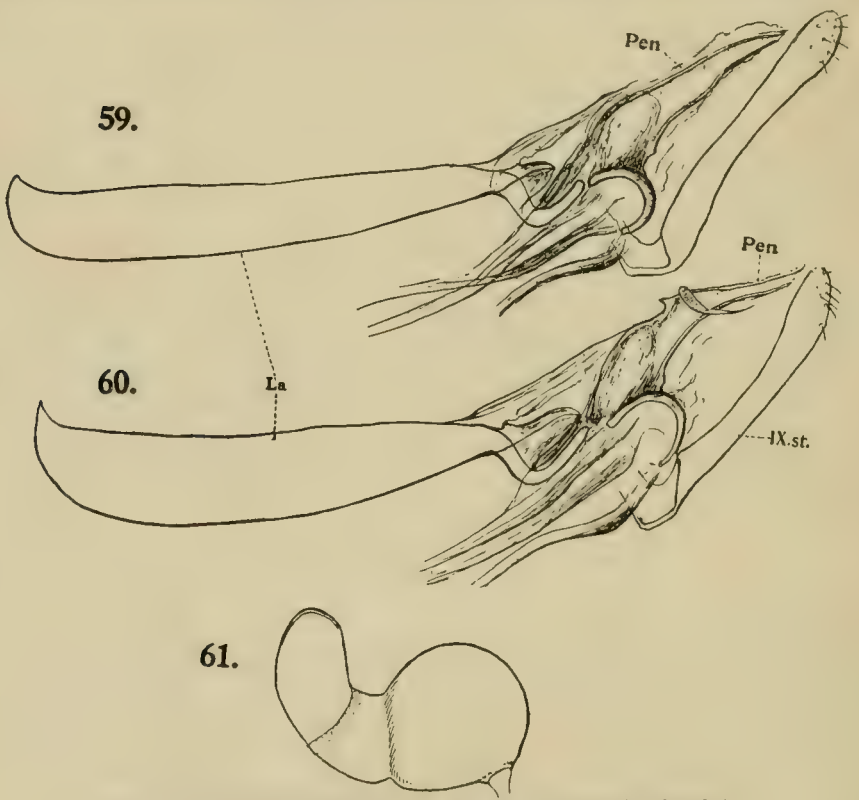


FIG. 59.—*Xenopsylla brasiliensis* ♂. FIG. 60.—*Xenopsylla robertsi* ♂.
FIG. 61.—*Xenopsylla robertsi* ♀.

of the external ♂ genital armature, and with the latter in the end-tube of the penis bearing a dorsal hook (text-fig. 60) and in the penis-plate (La) being broader than in *X. brasiliensis* (text-fig. 59). The ♀ differs from both allied species in the base of the tail of the spermathaca being less ventricose (text-fig. 61).

Mr. G. H. E. Hopkins drew my attention to the distinctions in the penis-plate and spermatheca, by which well-mounted specimens are recognizable without difficulty as belonging to *X. robertsi*, a name suggested by Mr. Hopkins as a small token of gratitude to the collector.

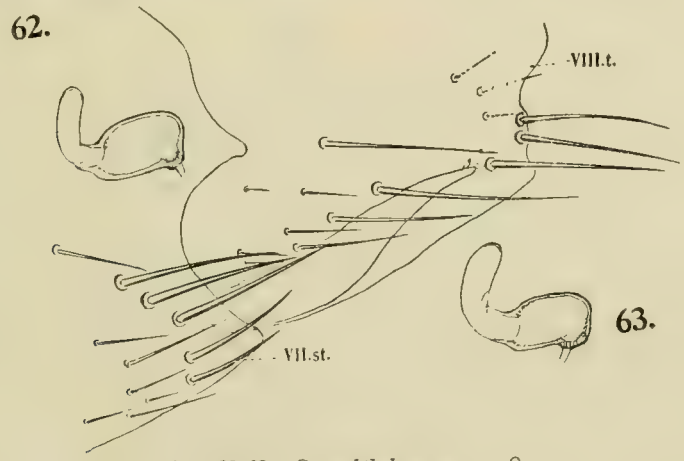
♂♀. Bristles on abdominal sternites (on the two sides together) in ♂: III to VI 6, VII 6 to 8; in ♀: III 7 or 8, IV 5 to 8, V 7 or 8, VI 8 or 9, VII 6 to 10 with an additional bristle on each side farther forward. In *X. hamula* the numbers are in ♂: III to VI 4, VII 2; in ♀: III to VI 6, VII 4.

A series of both sexes from Kerugoya, Kenya, off *Rattus rattus*, October 1934 (J. J. Roberts).

2. **Ctenophthalmus eumeces** J. & R. 1913 (text-figs. 62, 63).

♀. *Ctenophthalmus lycosius* J. & R., *Nov. Zool.*, xx, p. 556, text-fig. 26 (1913).

Described from the ♂ only (*l.c.*, p. 539, no. 23, text-fig. 19 (1913)). Mr. G. H. E. Hopkins has sent me two pairs with the request to describe the ♀. We have a



Figs. 62–63.—*Ctenophthalmus eumeces* ♀.

series of ♀♀ in the collection from the same place, Nakuru, Kenya, agreeing with those sent by Mr. Hopkins and with the ♀ described and figured, *l.c.*, erroneously as that sex of *Ct. lycosius*, all these specimens being placed with *Ct. eumeces* in the collection. Our mistake was caused by the fact that the single ♀ was found on the same host as the ♂♂ of *Ct. lycosius*. The arrival of a series of ♂♂ and ♀♀, the former agreeing with *Ct. eumeces*, and the latter with the ♀ supposed to be that of *Ct. lycosius*, led us to compare the chaetotaxy of the ♂♂ of the two species, and we found that in *Ct. eumeces* the longest dorsal apical bristle of the hindtibia is one-fourth shorter than hindtarsal segment I (the bristle measured from base), whereas in *Ct. lycosius* the bristle is almost as long as hindtarsal segment I (14 : 15). The ♀♀ of *Ct. eumeces* agree herein with the ♂♂, and we may therefore assume that the ♀ of *Ct. lycosius* also agrees with its ♂ (and probably will turn out to differ also in other details from the ♀ of *Ct. eumeces*). As the spermatheca of *Ct. eumeces* figured (as *lycosius*) in *Ectoparasites*, i, p. 306 (1923), is distorted, we take the opportunity to give sketches of this organ from two other specimens (text-figs. 62, 63); in fig. 62 the tail is too short, being

somewhat bent sidewards in the specimen and therefore foreshortened ; the head of the spermatheca varies to some extent in size, as shown in the figures. The seventh sternite (VII. st.) also is not quite constant, as was to be expected, but the general contour of the segment is the same in all specimens, the lateral angle being less pointed in some specimens than in our figure (text-fig. 62) and the margin of the segment at some distance below the projection less evenly incurved. The bristles of this segment are stouter in some specimens than in others, and their number is slightly variable. The two apical bristles of VIII. t. are marginal, the upper being a little shorter than the lower.

3. **Ctenophthalmus singularis** spec. nov. (text-figs. 64, 65, 66).

Unique among the African species of *Ctenophthalmus* in the movable sclerite of the clasper being terminally divided by a sinus into two rounded processes and in the eighth tergite of ♀ bearing basally each side an incrassation like a pair of brackets. In the shortness of the ventral arm of IX. st. of ♂ the

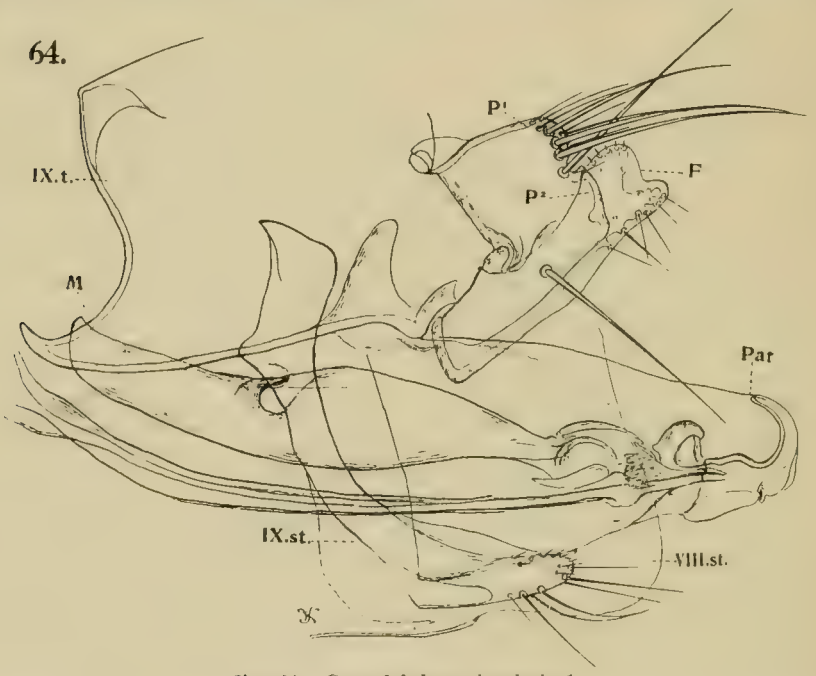


FIG. 64.—*Ctenophthalmus singularis* ♂.

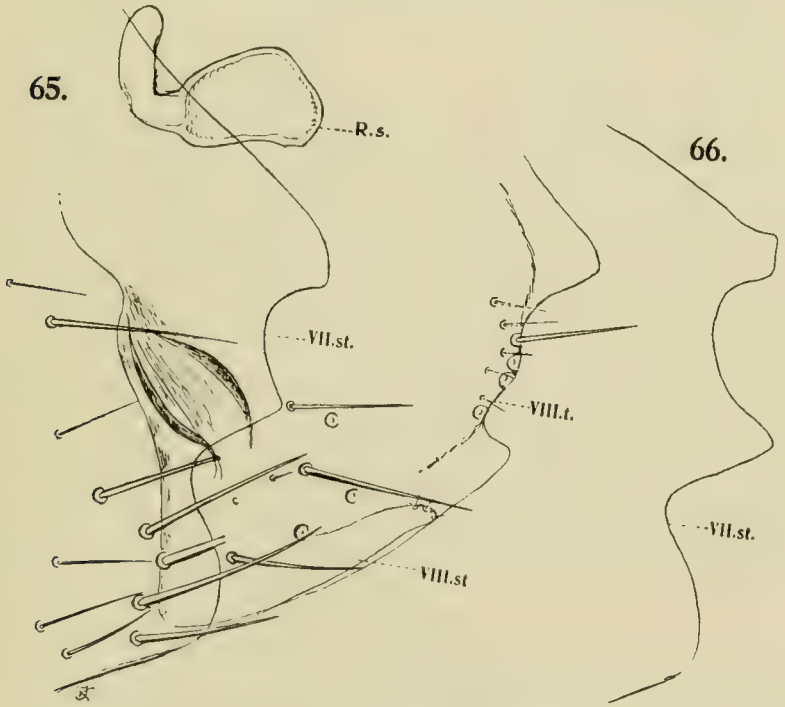
new species almost agrees with *Ct. ansorgei* Roths. 1907, near which it may be placed.

♂♀. There is nothing remarkable in the bristles of the body and legs. Metepimerum in ♂ with 6 or 7 bristles, in ♀ with 6. Apical spines on tergites (both sides together) : in ♂ on I 2 or 3, II 2 or 4, III 2, IV 2, V 0 or 1 ; in ♀ on I to IV 2. Bristles on tergites : in ♂ on III 16, 14 or 15, IV 11 or 15, 14, VII 10 or 13, 14 or 11 ; in ♀ on III 16 or 21, 15 or 14, IV 15 or 22, 15 or 14, VII 10 or 15, 8. On sternites : in ♂ on III 5, 8, IV 4 or 3, 6 or 8, V 3, 7 or 6, VI 2 or 3, 8, VII 3 or 5, 9 or 12, VIII 17 or 19 ; in ♀ on III 8 or 11, 8 or 9, IV 8 or 10,

11 or 10, V 5, 10, VI 9 or 6, 10, VII 10 or 13, 14 (in all cases the two sides together).

On dorsal margin of hindtibia 7 notches (inclusive of apical one), 1 to 6 bearing each a pair of bristles ; on outer side of hindtibia 6 subdorsal bristles ; the longest apical dorsal bristle of hindtibia in ♂ about one-tenth, in ♀ about one-third shorter than first hindtarsal segment.

♂. Dorsal portion of IX. t. (text-fig. 64) less curved forward than in *Ct. ansorgei*, in the second specimen projecting more than in the type (from which our figure is taken), the bay being more strongly rounded than in the figure. Manubrium (M) pointed, curved upwards. Clasper with small apical sinus, which separates the short, rounded, setiferous, dorsal process P^1 from the truncate ventral one P^2, the two processes about equal in width, the sinus rather narrower



Figs. 65–66.—*Ctenophthalmus singularis* ♀.

in the paratype than in the type. Movable sclerite F sublinear, three and one-half times as long as apically broad, apex divided by a terminal sinus into a broad dorsal and a narrower ventral projection, both rounded and of nearly the same length, slightly different in the two specimens and on the right and left sides of the body. Ventral arm of IX. st. short, triangular, in middle nearly half as broad as ventrally long (in a straight line from proximal ventral angle to apex), with about 6 longish bristles and a number of small ones in apical and subapical areas. Parameres of penis-armature without external hooks.

♀. VII. st. bisinuate (text-figs. 65, 66), the upper sinus less deep than the lower one, upper projection broader than lower, this above middle of side, nearly or quite as prominent as the upper angle, triangular, with the tip rounded off, upper

projection truncate in second specimen (fig. 66). On VIII. t. 2 or 3 small bristles above stigma on each side, and 8 or 9 on ventral area ; at apical margin 2 or 3 close together of which only the upper one is preserved ; this evidently much shorter than the bristles below it, a third apical or subapical large bristle (also broken) at apical subventral sinus. Near proximal margin of the segment a very distinct incrassation resembling a pair of rounded brackets, this peculiar thickening about on a level with the dorsal lateral bristles of VIII. t.; from the brackets (a pair on each side of the body) downwards the proximal margin of the segment slightly thickened. Spermatheca with the tail distinctly shorter than the head.

Two pairs from Madangi, Mt. Elgon, Uganda, August 1924 (J. Ford & G. L. R. Hancock), on *Rhabdomis pumilio* (2 ♂♂, 1♀) and *Lophuromys aquilus* (1♀).

SOME SIPHONAPTERA FROM SOUTH AMERICA.

By DR. KARL JORDAN, F.R.S.

(With 9 text-figures.)

1. **Parapsyllus coxalis** Roths. 1909 (text-fig. 67).

WHEN this species was described, no figures were given of the spermatheca and the terminal segments of the ♀ abdomen. We figure here the eighth segment, the spermatheca and bursa copulatrix, for comparison with the next species and in order to facilitate the determination of the ♀. The specimen from which the drawing is made was collected at Valparaiso on *Octodon degus*. Tergite VIII ventrally with 4 to 7 bristles, of which 3 or 4 are placed at or near ventral margin, one on side proximally of setiferous area of inner surface, and one at apical margin, the lateral bristle often absent; farther dorsal a proximal series of from 2 to 5 long bristles, often accompanied by some small ones, and still farther dorsal a submarginal row of 2 or 3; on inner surface a large number of bristles, of which 3 long ones are submarginal. Duct of bursa copulatrix (B.c.) short, upper wall of oviduct more or less regularly corrugated. Head of spermatheca (R.s.) narrowed to apex and gradually merging into tail, without sharp demarcation.

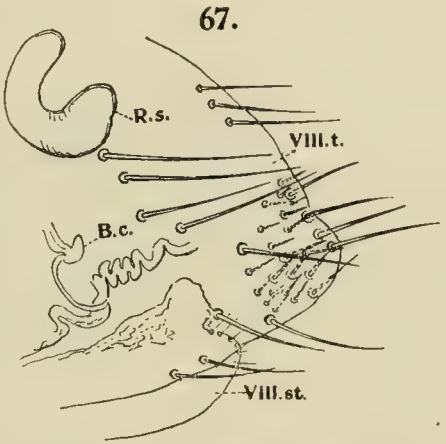


Fig. 67.—*Parapsyllus coxalis* ♀.

2. **Parapsyllus talis** sp. nov. (text-figs. 68, 69).

♂♀. Closely related to *P. coxalis*, with the same peculiar arrangement of large bristles on the forecoxa and with the same short fifth foretarsal segment. Differs in the tail-end.

♂. VIII. st. with a short ventral lobe, more strongly chitinized than the rest of the segment, from which it is separated by an incision, but produced beyond the apical margin of the portion of the segment above it; on side two bristles. Clasper (Cl) much longer than broad (as it is in *P. coxalis*), distally strongly rounded-oblique, dorso-apically projecting, but the angle strongly rounded off, at apex one long bristle, at dorsal and ventral margins a row of smaller bristles and two small bristles at oblique distal margin; manubrium (M) very much narrower than in *P. coxalis*. Movable sclerite F consisting of two portions, a proximal one which forms the joint with clasper and reaches above middle of the free outer portion, the latter widest in middle, more than three times as long as broad (measured from the most ventral point), equally and gradually narrowed ventrally

and apically, with 6 or 7 small bristles along posterior margin, tubercle of anterior margin near apex. Vertical arm of IX. st., which in *P. coxalis* bears on posterior side a large round projection, gradually narrows upwards, with a small hump at anterior margin on a level with lower margin of manubrium ; ventral arm with proximal half somewhat incurved dorsally and ventrally, and distal half first dilated-rounded and then gradually narrowed to a point, this triangular portion symmetrical, with a dorsal and a ventral row of slender

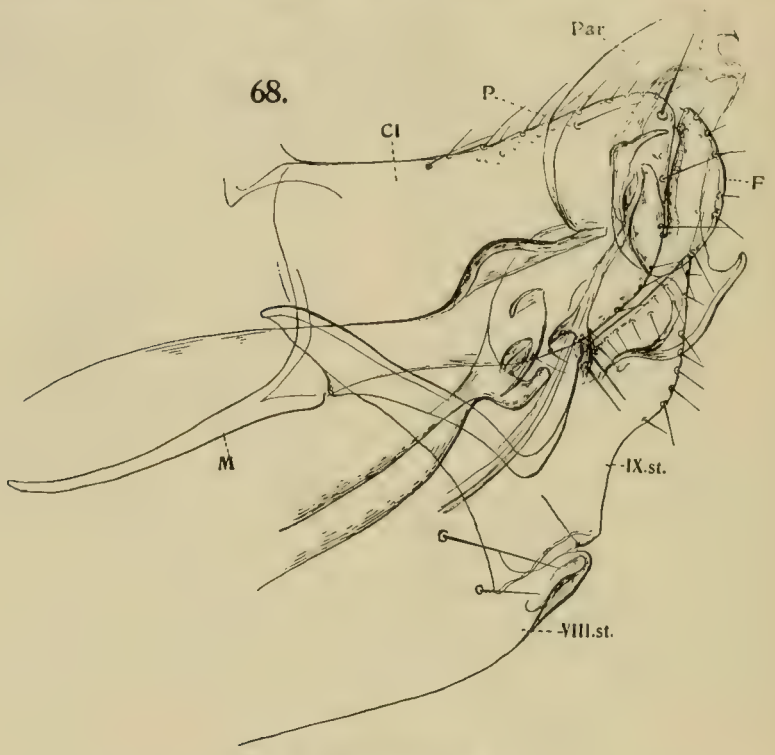


FIG. 68.—*Parapsyllus talis* ♂.

marginal bristles. Paramere of penis differs from that of *P. coxalis* especially in being enlarged ventrally, this ventral sclerite ending with an upcurved blunt hook.

♀. Sternite VII evenly rounded (text-fig. 69), bearing each side a row of 6 or 7 long bristles. On upper portion of widened area of VIII. t. 2 or 3 bristles proximally and 2 or 3 near upper oblique margin, on apical area 4 bristles on outer surface and about 15 on inner ; VIII. st. with a few very thin apical bristles. Spermatheca (R.s.) distinctly separated into head and tail ; head subtriangular, larger than in *P. coxalis*, and tail wider than in that species. Duct of bursa copulatrix (B.c.) much longer than in *P. coxalis*, strongly curved distad ; upper wall of oviduct much less corrugated.

Argentina : Fortin Uno, Rio Negro, 19. ix. 1934, on *Microcavia australis* (Dr. J. M. de la Barrera & M. A. Riesel), 1 ♂, 3 ♀♀, received from Dr. Eduardo del Punte.

3. **Tetrapsyllus litis** sp. nov. (text-fig. 70, 71).

♂. Close to *T. tantillus* J. & R. 1923 from Argentina, of which only the ♀ is known. Bristles on occiput and pronotum and the short apical spines of the abdominal tergites more numerous. Longest bristles of antennal segment II reaching to middle of club. Above antennal groove one median bristle with a small one obliquely above it. Pronotum with an anterior row of about 12 bristles (on the two sides together). Short apical spines on metanotum 1, on abdominal tergite I 18, II 10, III 5, IV 4; bristles on tergite III 19, 18, IV 17, 18, V 18, 19, VI 18, 16, VII 14, 15; number of bristles on sternites (two sides together) III 13, IV 13, V 13, VI 10, VII 9; on sternite II 2 or 3 small ventral bristles each side and

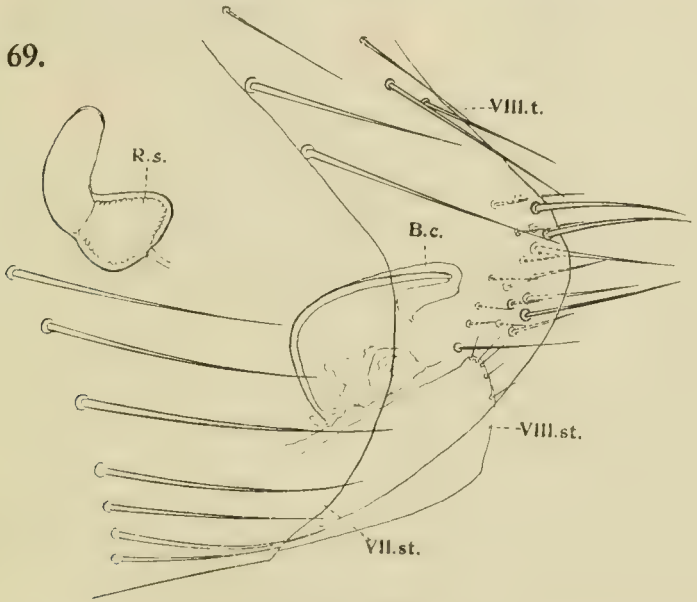


Fig. 69.—*Parapsyllus talis* ♀.

a lateral vertical row of 3 or 4 (several pale dots indicating vestigial additional bristles). On outside of hindfemur a subventral area of 6 bristles (inclusive of subapical ones), on inside 4 or 5. On outside of hindtibia a subdorsal row of 10 or 11. Longest apical bristle of hindtibia reaching to apex of tarsal segment I, that of segment I a little beyond apex of II, and that of II to middle of V.

Modified segments.——On sternite VIII (two sides together) a vertical row of 11 long bristles and in front of it 9 additional ones, most of them small. Clasper (Cl) a little longer than broad, truncate, very slightly incurved, lower angle broader and more strongly rounded than upper, which is somewhat produced (P), four long bristles at posterior margin, two above and two approximate ones below middle, at dorsal margin and on side of P some small bristles and one longish thin one, at lower angle and along ventral margin a row of 11 or 12 slender bristles; manubrium (M) narrowest in middle, broader at strongest proximal curve than widest position of ventral arm of IX. st. Movable sclerite F four times as long as broad in middle, widest at base, gradually curved, apex acuminate, at posterior margin about 6 to 8 short thin bristles. Vertical arm of IX. st. in middle about as

wide as F, hump of proximal side prominent, apex obliquely truncate, posterior margin slightly incurved and then feebly excurved; ventral arm inclusive of heel as long as vertical arm, dorsal margin first incurved and then excurved, ventral margin feebly excurved from base to apex, the sclerite widest beyond

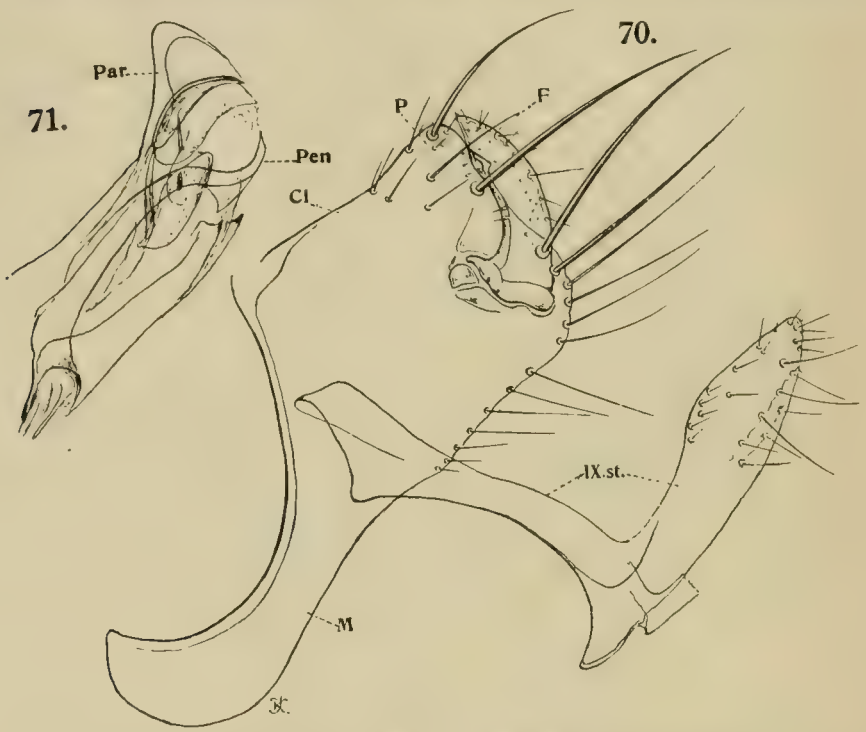


FIG. 70.—*Tetrapsyllus litis* ♂. FIG. 71.—*Tetrapsyllus litis*, penis-armature.

middle and the apical third triangular with the tip rounded off, along dorsal and ventral margins of triangular portion thin bristles, of which 3 or 4 subventral ones are fairly long, but very thin. Armature of penis (text-fig. 71, Par) characterized by the strongly convex hood and by the penis-tube being curved down and then upwards; the ventral sclerite ends in a short sharp tooth.

Length: 1·8 mm.

Chile: Valparaiso, on *Marmosa elegans* (J. A. Wolffsohn), 1 ♂.

4. **Dasypsyllus cteniopus** J. & R. 1920 (text-figs. 72, 73).

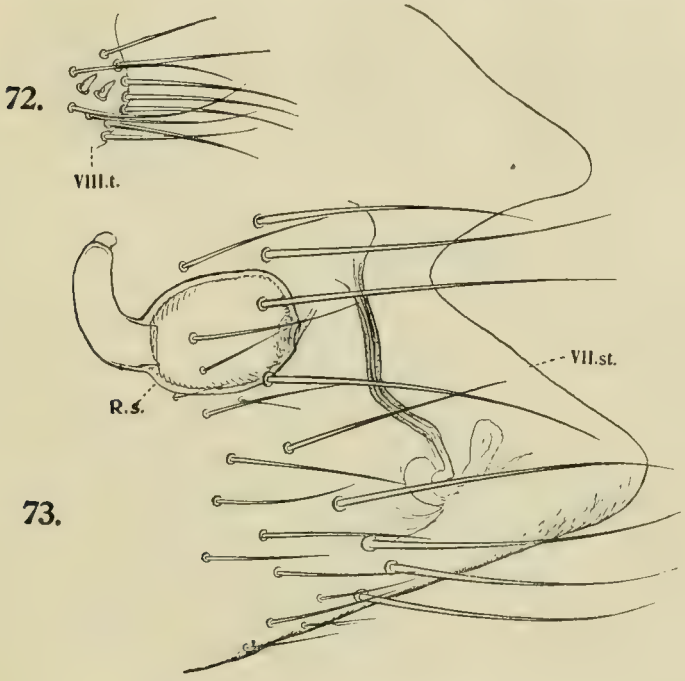
♂. *Ceratophyllus cteniopus* Jord. & Roths., *Ectoparasites*, i, p. 67, text-fig. 66 (1920) (Temuco, Chile).

Described from a single ♂. The ♀ lately received together with a small series of ♂♂ proves the sexes of this species to be more different in the development of the bristles than is usual in fleas. The ♂♂ of this series agree very well with the type-specimen, but show some individual variation, particularly in the number of the short dorsal bristles of the hindtibia varying from 7 to 10.

♀. The bristles more numerous than in ♂. Pronotum longer; between the base and the row of long bristles with more than 25 bristles, which are absent

♂. On mid- and hindfemora, outer surface, a large number of slender bristles

in three or four irregular rows, the bristles numbering on hindfemur over 30. Mid- and hindtibiae also with more lateral bristles than in ♂; the dorsal bristles not modified as in ♂, but normal, there being seven notches (inclusive of apical one), each bearing the usual pair of heavy bristles, with the exception of the first notch of which the inner bristle is thin, and the third notch which bears only one bristle. There is a likewise no comb-like development of the bristles of the first hindtarsal segment. Abdominal tergites I to V with apical spines. On



Figs. 72–73.—*Dasypsyllus cteniopus* ♀.

sternites IV to VI a posterior row of 15 or 16 long bristles, and in front of the row 14 to 16 small ones, on VII more than 25 small bristles and a row of 16, on the two sides together. This sternite (text-fig. 73) with a deep sinus above middle, the lobe above the sinus triangular, with the apex rounded, the ventral lobe similar (lateral aspect), but broader and longer. On each side of VIII. t. 40-odd bristles from the stigma downwards, the apical marginal ones close together; on inner surface two short, very stout spiniforms (text-fig. 72). Duct of bursa copulatrix long and rather strongly chitinized; head of receptaculum seminis about one-fifth longer than broad, tail a little shorter than head, with appendix.

Isla Mocha, Chile, 1. xii. 1932, in nest of *Pteroptochus rubecula* (F. C. C. Platts).

5. **Neotyphloceras crassispina** Roths. 1914.

This species consists of three subspecies distinguished by differences in the process of the ♂ clasper.

(*a*) **N. crassispina crassispina** Roths. 1914.

Process P of clasper shorter and more obtuse than in the other subspecies, the tip slightly curved down, and the last bristle close to the tip.

Peru: Pachacayo, 12,000 ft., on "Rat."——We have also a pair of the closely related *N. rosenbergi* Roths. 1904 from Peru (P. O. Simons), without precise locality, found on *Didelphis* sp.

(*b*) **N. crassispina hemisus** subsp. nov. (text-fig. 74).

Process P of clasper a little longer than in the previous subspecies, the tip slightly curved up, and the last bristle farther away from tip.

Argentine: Otro Cerro, Catamarca, x. 1919, on *Andinomys adax*, small series, type ♂, and on *Reithrodon caurinus*, 1 ♂, 1 ♀ (E. Budin); Chumbicha,

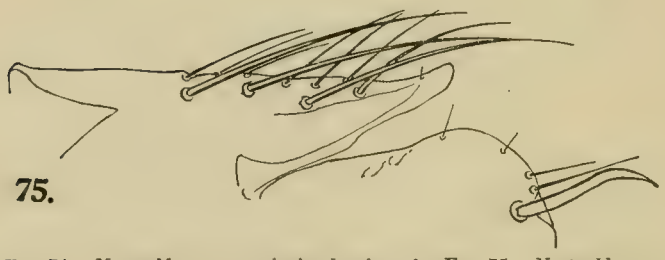


FIG. 74.—*Neotyphloceras crassispina hemisus* ♂. FIG. 75.—*Neotyphloceras crassispina chilensis* ♂.

Catamarca, ix. 1919, on *Phyllotis* sp., 1 ♂, 1 ♀ (E. Budin); Pilcaneu, Rio Negro, xi. 1919, 2 ♀♀ (H. E. Box); Piedra Pintada, Neuquen, on *Marmosa elegans*, 2 ♂♂, 3 ♀♀ (A. Lendl).——Bolivia: Potosi, ix. 1901, on *Akodon albiventer* and *A. boliviensis*, 1 ♂, 5 ♀♀ (P. O. Simons).

(*c*) **N. crassispina chilensis** subsp. nov. (text-fig. 75).

Process of clasper longer, curved up at apex, last long bristles much farther from tip.

Chile: Valparaiso, on *Marmosa elegans*, a series, on *Octodon bridgesi*, 1 ♀, on *Octodon degus*, 1 ♂, 1 ♀, on *Akodon olivaceus*, small series, on *Akodon longipilis*, 1 ♂, 1 ♀, on *Rattus rattus*, a series, on *Phyllotis darwini*, 1 ♂, 1 ♀, on *Abrocoma bennetti*, 2 ♂♂, 2 ♀♀ (all collected by J. A. Wolffsohn); San Christobal, on *Octodon degus*, 2 ♂♂, 2 ♀♀, on *Phyllotis darwini*, 3 ♀♀ (F. C. C. Platts).

DESCRIPTIONS AND RECORDS OF ORIENTAL ANTHRIBIDAE.

By DR. KARL JORDAN, F.R.S.

1. **Physopterus sumatranus ephelus** subsp. nov.

Ph. sumatranus Jordan, *Nov. Zool.*, xx, p. 263, no. 4 (1913) (Perak).

♂♀. Pronotum with fewer spots than in Sumatran specimens, there being no spots in the middle and only three each side, the most lateral one contiguous with the carina ; on the elytrum a single, larger postmedian tubercle, whereas in *Ph. s. sumatranus* Jord. 1897, this large tubercle is accompanied by a small one on the outer side.

One pair from Perak (W. Doherty).

Ecprepia gen. nov.

♂. Near *Merarius* Fairm. 1889, but head and rostrum very different. Rostrum longer than broad, flattened, rather stout at base, vertical, surface slightly concave in lateral aspect, median carina obsolete from base to middle, then thin and low to apical fifth, carina II short, at base close to middle line, curved outward and then running apicad, the two carinae II gradually slightly converging and stopping between antennae, III commencing half-way between eye and antennal groove and terminating above this groove. Frons convex, projecting above surface of rostrum, its dorsal portion impressed. Eye elliptical, prominent in lateral view. Antenna inserted at apical third, club compact, segment X transverse. Pronotum conical, carina abruptly curved forward at side, apex of angle rounded.——Genotype : sp. nov. hereafter described. The only species known has a high median tubercle on each elytrum.

2. **Ecprepia bigrumis** sp. nov.

♂. Pale rufous buff (immature ?), with blackish brown markings. Rostrum grey, five-eighths longer than broad, flat apex rugulose, apical margin straight, carina II conspicuous because naked and accentuated by the pubescence being dense on its outside ; underside with median carina. Cheek densely grey, the patch sharply defined and in front straight. Frons (♂) triangular, very narrow anteriorly, at the narrowest point as wide as middle of antennal segment III, anterior portion vertical, posterior portion horizontal and concave, the angle formed evenly rounded. Antenna reaching beyond base of elytra (if rostrum is in vertical position), shaft more or less pale rufescent, club black-brown, broad, III somewhat longer than IX.

Pronotum almost twice as broad near base than long, very little longer than apically broad (proportions 70 : 39 : 37), strongly narrowed forward from angle of carina, side first somewhat incurved and then evenly slanting to apex, upperside transversely depressed in middle of disc, somewhat uneven, without coarse puncturation, middle area pale rufous, occupying at carina a little over one-fourth the width of pronotum, widening in depression and narrowing at apex, side black-brown, with an isolated dorsal luteous spot before carina and an irregular luteous

stripe from angle of carina to apical margin, this stripe bounded ventrally by a black line ; dorsal carina slightly wavy, feebly concave in middle and towards side, faintly convex in between, lateral angle less than 90°, but its apex evenly rounded off, projecting rather strongly sidewards in dorsal aspect. Scutellum grey.

Elytra rufous buff, with short blackish linear spots, punctate-striate, interspaces irregularly convex, in middle of each elytrum a high tubercle, which is longer than broad, its base expanding between punctate stripes I and V, its top rounded, behind tubercle a white line, similar lines or spots behind some of the blackish spots and one on apical declivous area, a spot on shoulder, a tripartite one on subbasal swelling, a large one on anterior surface of tubercle extending to top, and a largish, elongate, irregular lateral patch behind shoulder black-brown, besides these markings a number of short lines, particularly in interspaces III, IV, V, VII and IX, posterior half of VI subcostate. Pygidium black in middle, as long as broad, evenly rounded at apex.

Prosternum with a transverse fold in front of coxae. Knees, apex of tibiae, base and apex of tarsal segment I and entire segments II to IV blackish brown. Midtibia (♂) with apical tooth. Hypopygidium (♂) with a narrow, curved process each side.

Length : 4·7 mm., width 2·5 mm.

Malay Peninsula : Fraser's Hill, Pahang, 4,200 ft., vi.1931 (H. M. Pendlebury), 1 ♂.

Echotropis gen. nov.

Near *Acorynus* Schönh. 1833. Disc of pronotum with transverse antemedian sulcus, and dorsal carina sharply angulate in middle. Rostrum broader than long, with 5 abbreviated dorsal carinae.——Genotype : *E. retusus* Jord. 1926, described as an *Acorynus*.

3. **Echotropis cultus** sp. nov.

♀. Similar to *E. retusus* Jord. 1926, narrower, carinae of rostrum much less elevate, frons much broader, lateral angle of carina of pronotum much smaller, and grey pubescence of elytra more extended.

Brown, rufescent, pubescent grey. Rostrum one-eighth broader than long, vertical, flattened, with middle of apical fourth somewhat swollen, median carina very feebly developed, very little raised, carina II distinct, but less high than in *E. retusus*, its apex curved obliquely sidewards, carina III distinct, joining cariniform margin of antennal groove. Eye with a rather narrow creamy grey border above. Frons creamy grey anteriorly, nearly as broad as segment III is long (ratio 11 : 14). Antenna pale rufous at base, segment X less than twice as long as broad (ratio 11 : 7), length of segments II to XI : 10, 14, 12, 11, 10, 10, 9, 24, 11, 30.

Pronotum half as broad again as long, conical, smooth, median five-sevenths brown, sides of this area straight, somewhat convergent forward, from scutellum frontad a creamy grey line gradually becoming thinner, almost absent from transverse sulcus to apical margin, at base nearly thrice as broad as scutellum, between apex of lateral carina (a little above it) and apical margin a brown ovate spot ; dorsal carina rather strongly convex from middle to side ; lateral angle less than

90°, but with the apex rounded off, lateral carina straight, somewhat inclining downward. Scutellum grey.

Elytra as broad at base as prothorax, punctate-striate, interspaces flat, except base of sutural one ; the following markings dark brown : a large round patch occupying subbasal swelling, a small spot outside it, a spot at shoulder angle, a rhomboidal antemedian sutural patch extending to middle of interspace III, somewhat angulate, produced forward on suture to a spot placed in between the subbasal swellings, laterally of sutural rhomboid a small spot linear in IV and shorter in III, at side a spot behind shoulder and a smaller one in middle joined together by a line in IX, above them another line joining second lateral spot in a curve, before apical declivity a transverse dentate band extending obliquely backwards from punctate stripe I to outer margin, which it reaches above abdominal segment III, on declivous area an anteriorly open arc from near suture to lateral end of preceding band, inner margin of arc with a small sharp tooth in middle, farther forward a diffuse double spot in interspaces III and IV joined to the arc. Pygidium three-fifths broader than long, nearly semicircular.

Underside densely pubescent grey, derm of sides more or less rufous (immature ?), especially on abdomen. Legs rufescent brown, base and apex of femora and base of tibiae paler.

Length : 4·6 mm., width 2·2 mm.

North Borneo : Samawang near Sandakan, vii. 1927 (C. Boden Kloss & H. M. Pendlebury), 1 ♀.

4. **Cedocus lynceus** Jord. 1911.

Malay Peninsula : Fraser's Hill, Pahang, vii. 1931 (H. M. Pendlebury), 1 ♂.

5. **Mecocerina rhanis** Jord. 1911.

Malay Peninsula : Kapong, 600 ft., xi. 1929, at light (M. L. Webber), 1 ♂.

6. **Nessiodocus angulatus nigrans** subsp. nov.

♀. Like *N. a. angulatus* Jord. 1928, from Tonkin, but dorsal carina of pronotum medianly less distinctly angulate, and most of the black-brown markings of upperside enlarged : on pronotum more than median third black-brown, this area constricted in middle of disc and again at carina, and divided by a grey longitudinal stripe reaching from base to beyond middle ; at side an elliptical patch. On elytra no brown sutural spot behind scutellum ; patch on subbasal swelling, transverse antemedian band, limbal patch at shoulder, and the two patches in posterior half so much enlarged that the grey pubescence occupies much less space than the black-brown markings, the patches connected with one another.

Malay Peninsula : S. Bulok, Selangor, i. 1930 (M. L. Webber), 1 ♀.

Xenopternis gen. nov.

Near *Nessiodocus* Heller 1925, but hindtibia of ♂♀ with rod-like apical process. Rostrum short, vertical, upperside flat, with a lateral carina from eye to near apex, along its outer side a groove, on cheek a distinct channel from eye to antennal groove ; apical margin slightly sinuate. Eyes subdorsal, round, a little longer than broad. Antenna much longer in ♂ than in ♀, in ♂ segment I club-

shaped, twice as long as II, as long as III, club compact, little broader than shaft, VIII longer than IX, X short ; in ♀ I and II nearly alike, shorter than III, VIII about twice as long as broad, half as long as IX, club broader than in ♂, X short. Frons in ♂ one-seventh, in ♀ one-sixth as broad as apex of rostrum. Underside of rostrum somewhat swollen, on a much higher level than throat, from which the labiophore is divided by a deep transverse depression. Pronotum and elytra as in *Nessiodocus* and *Mucronianus* Jord. 1894. Apical ventral process of hindtibia the same in ♂♀, not quite thrice as long as broad, cylindrical, but dorsally somewhat flattened, apex truncate and concave.——Genotype : sp. nov. here described.

7. **Xenopternis lissus** sp. nov.

♂♀. Cylindrical, more than twice as long as broad (head excluded), rufescent brown, underside densely greyish white, upperside more extended brown than buffish grey. Rostrum nearly half as broad again near apex than long, widest point at anterior projection of rim of antennal groove, which is close to apex, upper surface rugate, with a slight indication of a small impressed median line at base, carina from eye to near apical margin slightly and very gradually incurved, the two carinae nearly as far apart at apex as at eyes ; rostrum and head rather sparsely grey except cheek. On occiput the border of eye somewhat yellowish. Eye large, not prominent. Antenna blackish brown, pale rufous at base, in ♂ reaching to near apex of elytra, in ♀ beyond basal margin ; length of segments :

♂ 30, 11, 28, 25, 24, 22, 22, 20, 15, 6, 14.——♀ 9, 9, 10, 10, 9, 7, 7, 6, 8, 5, 10.

♂ 27, 9, 25, 22, 19, 16, 16, 13, 12, 6, 14.——♀ 8, 8, 11, 10, 9, 7, 8, 7, 8, 6, 9.

Pronotum about half as broad again as long, apically truncate, widest some distance from base, minutely granulate-coriaceous, a median stripe widest at base, gradually narrower apically, a narrow sublateral stripe and the border of lateral carina, more or less extended along dorsal carina, whitish grey ; dorsal carina slightly incurved in centre, laterally flexed forward in a wide arc, reaching beyond middle of side. Scutellum transverse, whitish grey.

Elytra parallel, slightly flattened above, half as long again as broad, minutely granulate-coriaceous, with rows of punctures, which are obsolescent posteriorly, no impressed stripes except sutural one, a sutural area from base to beyond middle, laterally extending to third line of punctures, apical margin and apex of suture, and an interrupted, narrow ante-apical band connecting them whitish grey, usually some small whitish grey spots at side and on shoulder. Pygidium whitish grey, much suffused with rufescent brown, flat, almost evenly rounded, nearly as long as broad in ♀, distinctly shorter in ♂.

Legs rufous, segments III and IV of tarsi blackish, I a little longer than II to IV.

Length : ♂ 3·2–3·3 mm., ♀ 3·8–3·9 mm.

Java : Koebangkangkong, Zuid-Banjoemas, 25 m., ii.32 (F. C. Drescher), 2 pairs.

8. **Hucus loratus** sp. nov.

♀. Rostrum without dorsal carinae ; elytra with a creamy white pattern recalling a tennis racket, the loop at apex and the handle sutural, the latter running across pronotum.

Russet (somewhat immature ?), rostrum and sides of pronotum and elytra

blackish. Rostrum vertical to throat, flat, coarsely rugate-punctate, one-fourth longer than broad, lateral margin cariniform from apex to near middle, here very slightly expanded, concealing antennal groove, difference in width of basal and apical portions of rostrum less marked than is usual in this genus ; apical margin truncate, slightly sinuate towards side ; before eye a deep groove bounding a large white genal spot ; in middle of rostrum near base a minute white dot in type, absent from paratype. Frons slightly more than one-fourth as broad as rostrum. Eye circular, but outline straightened towards genal spot, a thin white border, interrupted in several places. Antenna slender, as long as elytra (in dorsal aspect), segments I and II very pale, almost translucent, III to VIII brown, pale at apices, III about one-third longer than IV, IV to VII almost equal in length, VIII shorter, club as long as V to VIII together, black, IX and X nearly linear, XI elongate-ovate, subacuminate, IX one-third longer than X, twice as long as broad, XI as long as IX.

Pronotum conical, as long as broad, minutely granulose, punctate at sides, with transverse groove across disc, a narrow, sharply defined, creamy white median stripe, continued on to head, towards sides indications of small white spots, dorsal carina convex, faintly incurved medianly, lateral angle less than 90°, but rounded off. Scutellum white.

Elytra depressed behind basal margin, which is curved forward, subbasal swelling low, but distinct, blackish, partly encircled by a thin white line, from each side of scutellum a short white line which joins a second line also starting from base but separate from first, this line extends to apex, touching suture in middle, and running as a single line along it from behind middle, narrow at apex and extending along apical margin, from behind middle, where the line is somewhat widened, a branch extends obliquely backwards to lateral margin, here joining the white apical border and a second, curved, subapical branch ; thus an ovate area is separated from anterior portion of elytrum, within that loop a transverse line which does not quite reach to lateral portion of loop, and in interspaces III and V a line forward from transverse one and in VII a line backward ; on rest of elytra a few minute white dots, stripes of punctures feebly impressed, but punctures deep, interspaces of stripes minutely granulose. Pygidium almost semicircular, granulate, dark brown, sides white.

Underside very pale buff, particularly abdomen, densely pubescent white, except sides of prosternum, where pubescence is sparser ; metepisternum with brown spot ; punctures on prosternum large but dispersed, those on metasternite smaller. Femora as pale as base of antenna, apex blackish brown, tibiae likewise brown, with a subbasal and a subapical pale ring, the subapical one less distinct in paratype than in type ; segments I and II brown at base, grey at apex to a varying extent.

Length : 3·6–3·9 mm.

British India : Samaingh, Kalimpong, Bengal, ix. 1934 (N. C. Chatterjee), 2 ♀♀, ex *Polyalthia simiarum*.

9. **Rhaphitropis discus** sp. nov.

♂♀. Dark chocolate-brown, tibiae rufescent. Upperside sparsely marked with grey. Rostrum half as broad again as long, sparse grey pubescence faintly concentrated in middle at base, apical margin slightly curved forward, depressed. Frons in ♂ one-half and in ♀ two thirds the width of rostrum. Eye a little longer

than broad, wider at frontal side than laterally, its margin toward antenna straightened. Interspace between antennal groove and eye much wider than groove, which is small. Antenna short, scarcely reaching to basal angle of pronotum, slightly rufescent at base, segment III a little shorter than II and very much thinner, IV = III or a trifle longer, VIII one-third shorter than VII, club flattened, compact, in ♂ thrice as long as broad, in ♀ a very little shorter, XI ovate, broader than IX, X transverse.

Pronotum with rather indistinct grey markings at sides, namely a broadish lateral stripe from carina to apex, gradually narrowing anteriorly, in this stripe a large brown spot, which is connected with the brown median area if grey stripe dorsally incomplete, in front of carina farther dorsad a short elongate grey spot, in centre faint indications of grey spots ; dorsal carina obtusely angulate in middle, angle very distinct, laterally the carina flexed forward in an abrupt curve, the lateral arm quite short. Scutellum white.

Elytra one-fourth longer than broad, granulose, strongly punctate-striate, basal margin curved forward, behind feeble subbasal swellings a grey transverse band across suture composed of confluent spots extending to stripe V and projecting to scutellum, before apical declivity another band, more broken up, and laterally the bands connected by some grey spots, these markings sometimes distinct, sometimes partially effaced, faint indications of spots also toward margins, in certain lights the elytra appear slightly silky grey, especially between the bands.

Length : ♂♀ 2·7–2·9 mm.

India : Konain Chakrata, U. Prov., vi.1934 (J. C. M. Gardner), a few specimens. Near *R. marchicus* Herbst 1797, but broader, eye less transverse, frons of ♂ narrower.

10. **Rhaphitropis carbo** sp. nov.

♂♀. Pitchy black, inclusive of antenna and legs, pubescence greyish white, evenly scattered, not forming any spots. Proboscis very short, twice as broad as long, coarsely granulate, middle somewhat impressed, apex emarginate. Frons in ♂ one-eighth width of rostrum, in ♀ one-fourth. Eye large, little longer than broad, its outline straightened on side towards antenna. Antennal groove small. Antenna short in both sexes, not reaching to base of pronotum, club compact, IX about as long as broad, X broader than long, XI a little longer than broad, broader than IX.

Pronotum coriaceous, somewhat granulate ; carina parallel with basal margin of elytrum, which is curved forward, median angle very distinct but rounded off, laterally the carina rather abruptly curved forward, lateral branch quite short. Scutellum strongly transverse, pubescent greyish white. Elytra granulose-coriaceous, strongly punctate-striate.

Length : 2·3 mm.

India : Dehra Dun, U.P., vi.1934 (A. K. Sharma), 1 ♂, type, ex *Artocarpus lacoocha* ; Suswa R., Dehra Dun, v.1931 (E. F. C. Beeson), 1 ♀, ex *Bombax malabaricum*.

11. **Rhaphitropis habrus** sp. nov.

♂♀. Near *Rh. elusus* Jord. 1928, from Tonkin, but subbasal swelling of elytrum raised as a broad and fairly high tubercle and carina of pronotum farther from base.

Rufescent brown, derm variegated with pale rufous and dark brown, pubes-

cence of upperside a mixture of brown and grey, with hardly any distinct pattern. Rostrum and head very densely and coarsely rugate, structure not concealed by the sparse pubescence. Eye a little longer than broad, with shallow emargination. Antennal groove somewhat nearer to eye than to base of mandible. Antenna pale rufous at base, darker distally, in ♂ reaching to near middle of elytra, shorter in ♀, length of segments II to XI: ♂ 8, 11, 9, 10, 10, 10, 9, 10, 7, 10; ♀ 8, 10, 9, 7, 7, 7, 6, 8, 7, 9; club about as broad as segment II.

Pronotum one-fifth broader than long, very strongly convex, coarsely and very densely rugate, also behind carina, variegated with grey, a broad basal median patch continued forward by a rather thin stripe, and a small subapical patch about half-way to side fairly conspicuous; carina at one-quarter from base, very feebly concave in middle, then nearly straight to side, lateral arm short, directed obliquely downward, at side much nearer to true basal margin than to dorsal carina; a short transverse carinula which curves upwards laterally, but disappears in the roughness of the derm, not reaching dorsal carina. Scutellum greyish white.

Elytra two-fifths longer than broad, nearly straight at side, base truncate, slightly incurved from shoulder to shoulder, shoulder angle prominent, punctate stripes distinct, interspaces densely and rather conspicuously granulate, subbasal swelling raised as a tubercle which is longer than broad with the top strongly rounded; the tubercle, a spot just before middle in interspace III and another at side as well as a transverse band across suture in front of apical declivity blackish, apex grey, sutural area from tubercle to band and the side more or less variegated with grey, derm pale rufous; at and above shoulder in a view from behind the antemedian spots almost form a black transverse band. Pygidium grey, more convex in ♂ than in ♀.

Underside grey; prosternite coarsely punctate, sides of metasternite with the punctures more dispersed and rather smaller. Legs rufous, femore somewhat darker.

Length: ♂♀ 3·4 mm.

Java: Goenong Slamet, Batoerraden, ii.1932 (F. C. Drescher), 1 ♂, type; K. O. Blawan, Odjen Plateau, 900–1,500 m., xi. 1933 (H. Lucht), 1 ♀.

12. **Rhaphitropis pissodes** sp. nov.

♂♀. Differs from all species in the lateral angle of the pronotal carina being square and the lateral carina extending a little beyond middle. Represents a new generic type, but as the undescribed species of *Rhaphitropis* and allied genera evidently are very numerous and diverse, a generic revision will be required to bring order into this mass of small Anthribids.

Dark brown, upperside with dispersed greyish white markings of which a short basal sutural stripe is the most conspicuous. Rostrum nearly twice as broad as long, apical half flattened, slightly impressed in middle, apical margin feebly sinuate. Frons convex, as broad as rostrum is long, with rather indistinct white median stripe which runs on to rostrum and occiput. Eye transverse, higher than usually, highest near outside, here abrupt. Behind eye a diffuse white patch. Antenna slightly rufescent, segment III shorter than II, III to VIII gradually decreasing in length, VIII half III, club much broader than II, fairly compact, IX triangular, X as long as broad, XI elongate-elliptical, both IX and XI longer than II.

Pronotum a little more than one-third broader than long, minutely coriaceous, widest at angle of carina, sides rotundate-angustate, apical margin faintly incurved in middle ; a narrow, interrupted median line, very thin in posterior half, and on each side of disc 6 or 7 spots, of which the most lateral at lateral carina, white ; dorsal carina at one-ninth from base, moderately concave in middle, then somewhat convex, lateral angle 90° with the tip rounded off, lateral carina reaching beyond middle, gradually fading away, not terminating abruptly, longitudinal basal carinula distinct, joining dorsal carina at angle. Scutellum white, transverse.

Elytra two-fifths broader than long, only a trifle broader than prothorax, punctate-striate, but stripes feebly impressed, interspaces densely granulate, basal margin strongly curved forward, subbasal swelling and depression behind it hardly at all indicated, white basal sutural stripe to beyond one-fourth, followed by a sutural space without grey, all interspaces with narrow grey stripes broken up into spots. Pygidium more strongly rounded in ♀ than in ♂ and shorter, in ♂ nearly as long as broad.

Underside impunctate, minutely coriaceous, greyish-white pubescence not very dense ; prosternum much shorter in front of coxa than coxa is broad ; mesosternal process truncate, about as broad as coxa.

Length : ♂♀ 3·4 mm.

Java : Koebangkangkoeng, Zuid-Banjoemas, 25 m., v. 1932 (F. C. Drescher), one pair.

13. **Uncifer lius** sp. nov.

♂♀. Rufescent, paler in parts, upperside variegated with brown and grey, elytra with blackish band from side to side at commencement of apical declivity.

Rostrum grey, derm of apex broadly pale rufous. Frons and occiput brown, grey at eyes. These transverse, longer in ♂ than in ♀, therefore frons broader in ♀. Antenna pale rufous at base, somewhat darker distally, segments III to VIII almost gradually decreasing in length, III longer than II, club broader than II, IX and XI as long as III, X shorter.

Pronotum nearly half as broad again as long, minutely coriaceous, sides grey, with an elongate brown patch, disc with large brown area, variable in depth of tint, widest at carina, narrowest at apical margin, somewhat constricted behind apex, divided by a grey median stripe which is interrupted in middle and stops at slight subapical depression ; carina distinctly concave in middle, then convex, lateral angle acute and projecting backwards, side branch quite short, without indication of a forward prolongation. Scutellum grey, transverse.

Elytra minutely granulose, punctate-striate, basal margin convex, a large basal spot at some distance from suture, shoulder-angle, a large antemedian patch, oblong, with the angles produced, and an anteapical transverse band, more or less interrupted at suture, brown or blackish, large area from interspace IV sidewards brown mixed with grey, apex grey, derm pale, basal swelling and depression behind it very feebly indicated. Pygidium sparsely grey, evenly rounded, longer in ♂ than ♀.

Underside impunctate, grey, derm of sides of prosternite and abdomen pale rufous ; legs pale rufous.

Length : ♂♀ 2·5–2·9 mm.

Java : Goenong Raoeng, Bojoekidoel, 450–700 m., i. 1933 (H. Lucht), 1 ♂ (type), 1 ♀ ; Goenong Tangkoeban Prahoe, Preanger, 4,000–5,000 ft., vii. 1934

(F. C. Drescher), 1 ♂; Batoerraden, Goenong Slamat, iv.1932 (F. C. Drescher), 1 ♂.

14. **Uncifer stigmosus** sp. nov.

♂♀. Similar to *U. diffinis* Jord. 1925, from Ceylon, of which only the ♀ is known; frons broader, club of antenna shorter (in ♀), pronotum more extended grey, legs darker rufescent.

Upperside grey and rufescent brown, underside grey. Rostrum and frons grey. Frons in ♂ two-fifths, in ♀ not quite one-half as broad as rostrum (in ♀ of *U. diffinis* one-third). Occiput brown, with a median line and a border to the eye grey. Club of antenna in ♂ longer than in ♀, IX shorter than III, one-third longer than broad, X a little longer than broad and broader than IX, XI elliptical, longer and broader than IX, in ♀ IX slightly longer than broad, X broader than long.

Pronotum: grey pubescence variable in extent, sometimes nearly the whole pronotum grey, in middle a large rhombiform grey patch usually with brown centre, the patch joining the grey lateral area and reaching medianly to apical margin and carina, there being a brown spot each side of forward and backward projections of patch, before carina each side one or two other brown spots, which sometimes extend forward to apex, breaking up grey lateral area; lateral angle of carina acute, carina medianly slightly and broadly incurved. Scutellum greyish white.

Elytra with large brown median patch on suture extending sidewards to impressed stripe II, usually with a sidewards projection to stripe III anteriorly and posteriorly, the patch then resembling a stretched tailless mammal skin with the neck and lower portions of the legs cut off, size of patch variable, as are the patches on shoulder and on subbasal swelling, in interspaces III to X a row of brown roundish spots, variable in number, sometimes partly conjoined, no brown transverse band on apical declivity.

In ♂ middle of abdominal sternites I to III flattened, this space flanked by a carina which, on II, bears conspicuous pale pubescence, IV medianly depressed, without carinae.

Length: ♂♀ 3·0–3·9 mm.

British India: Dehra Dun, v.1933 (J C. M. Gardner), a small series.

Illis gen. nov.

♂♀. Recalls *Hormiscops* Jord. 1914, but eye less dorsal and more finely granulose, rostrum longer, apically sinuate, segment II of antenna claviform, angle of pronotum more rounded. Rostrum obliquely porrect, widened at apex, apical margin sinuate, lateral margin projecting over the antennal groove, which is triangular; underside subcarinate or carinate in middle, ridge between buccal sinus and antennal groove channelled; lobes of labiophore rounded at apex; labium with slight indication of median sinus. Antenna much longer in ♂ than in ♀. Eye longer than broad, more or less oblique, subdorsal. Pronotal carina dorsally basal, straight, laterally curved forward in a wide arc to meral suture of prosternum, below it a carinula complete from side to side, curved up at end to near angle of carina. Basal margin of elytrum nearly straight, slightly curved forward near scutellum; pronotum and elytra convex. Segment I of tarsi as long as II to IV, tooth of claw large, projecting from middle.——Genotype: *I. rusia* sp. nov.

15. **Illis rusia** sp. nov.

♂♀. Rufous brown, the portions of upperside covered with grey pubescence as well as legs and base of antenna pale rufous. Underside uniformly grey, upperside with variable brown markings as follows: on each side of occiput a triangular spot extending on to frons; on pronotum between middle and lateral carina three streaks, irregular, entire, or the two lateral ones more or less divided each into two spots, all streaks connected with one another, the two near middle much the broadest, broadly joined together across centre, reaching neither carina nor apical margin, somewhat resembling a capital H, the two streaks separated posteriorly by a broadish, anteriorly rounded, grey projection from the grey basal border, anteriorly the two halves of the H separated by a narrow grey line, sometimes the pronotum more extended brown than grey. Elytra brown, basal margin, a large patch around shoulder, a broad stripe on suture from base to behind subbasal swelling, a transverse apical border bearing a triangular brown spot, and numerous smaller spots from subbasal swelling to apical declivity grey, more or less united, sometimes these spots rather sharply define delongate dashes; subbasal swelling, an antemedian sutural patch and a transverse area on declivous apex devoid (or nearly) of grey spots.

Nearly 2½ times as long as broad, not unlike a small specimen of *Basitropis* Jekel 1855. Rostrum narrowed towards base, one-fourth broader than long, rough with umbilicate punctures, somewhat rugulose, with indication of a median carina at base. Frons half as wide as rostrum, like occiput with a dense net of umbilicate punctures. Eye feebly excised towards antennal groove, interspace between groove and eye very little broader than segment I of antenna. In ♂ antenna reaching beyond middle of elytra, segments III to IX nearly the same in length or (in longer antennae) VII as well as VIII longer than the others, III about as long as I and II together, but thinner, less than half as long as the rostrum is broad, club slender, loose, IX and X triangular, XI elongate elliptical, X not quite twice as long as broad; in ♀, antenna shorter, not reaching much beyond base of elytra, III not much longer than II, VIII shorter than II and X, IX longer than III, club broader and shorter than in ♂, more compact, IX triangular, X nearly square, but somewhat narrowed towards base.

Pronotum nearly half as broad again as long, evenly convex, widest in middle, minutely and densely granulate, slightly regulose. Elytra coarsely striate-punctate, very feebly depressed behind subbasal swellings, evenly convex from this depression backwards. Pygidium rounded, broader than long.

Femore darkened in middle; tarsal segment I about as long as II to IV together; midtibia of ♂ with small sharp mucro at apex.

Length: ♂♀ 2·5–2·8 mm.

Batoerraden, G. Slamet, iv., v., ix., xii., 1932 (F. C. Drescher), a small series.

16. **Illis omopholis** sp. nov.

♀. Rostrum and eye recall *Sintor* Schönh. 1839. Chocolate-brown, underside uniformly silky grey, upperside spotted with grey: on pronotum a transverse apical or subapical row of spots, a median spot before carina and two each side some distance in front of carina; on elytrum a large basal spot above shoulder, two smaller ones in third interspace, one each in middle and before apical declivity, and a spot near apical margin, all the interspaces with a grey line, complete or broken up.

Rostrum rough with umbilicate punctures, somewhat rugulose, narrowed toward base, nearly half as broad again as long, with a flat carina from base to middle; pubescence sparse, denser at sides. Frons half as wide as rostrum, coarsely umbilicate-punctate. Eye more than half as long again as broad, with a small notch toward antenna, interspace between eye and antennal groove broader than segment I of antenna. Segments I and II of antenna pale, III little longer than II, VIII about twice as long as broad, club broad but not compact, IX triangular, one-third longer than broad, broader than long, XI elliptical, broader near base than near apex, as long as IX.

Pronotum densely and finely granulate, nearly evenly convex, broadest close to base, one-fourth broader than long. Scutellum grey. Elytra convex, with a feeble depression behind the almost effaced subbasal swellings, very densely granulate, striate-punctate, the punctures rather large, but the stripes not much impressed. Pygidium brown, rounded, broader than long.

Underside minutely coriaceous, with indications of shallow punctures on prosternum, which is somewhat swollen. Tibiae brown on upperside, excepting a diffuse pale subbasal ring.

Tarsal I as long as II to IV.

Two subspecies:

(a) **Illis omopholis omopholis**

♀. Eye nearly twice as long as broad. Pronotum each side with three sharply defined apical spots and a narrow subapical median spot and from carina forward three small postmedian ones, besides a conspicuous median spot. On elytra two diffuse lateral spots, all the interspaced with a grey stripe, but the stripes in II, IV, VI and VIII thinner and incomplete.

Length: 3·3 mm.

North Borneo: Bettotan near Sandakan, 25.vii.1927 (C. Boden Kloss & H. M. Pendlebury), 1 ♀.

(b) **Illis omopholis seriata** subsp. nov.

♀. Eye somewhat less elongate than in the previous subspecies. Anterior spots of pronotum all subapical, the lateral ones small and ill-defined, the whole pronotum with scattered grey pubescence. Interspaces V, VII and IX with a row of spots, the two in III larger than in the Bornean specimen.

Length: 3·6 mm.

Philippines: Kolambugan, Mindanao, 1 ♀.

17. **Illis medana** sp. nov.

♂. Similar to *I. rusia* sp. nov., but frons and club of antenna broader and colouring different.

Occiput without brown spots. Pronotum for the greater part rufous brown, bearing an interrupted grey median stripe, anterior portion of stripe triangular, broader and posterior portion narrower than in *I. rusia*, in grey lateral area a large elongate-ovate brown spot separated from brown median area by a narrow grey line which does not quite reach the apical portion of lateral grey area, no additional grey stripe between grey lateral area and interrupted median stripe. On elytra the basal sutural patch longer than in *I. rusia*, posteriorly narrower than anteriorly, postmedian dorsal patch broadly connected along suture with apical patch,

extreme end of suture and narrow apical border remaining brown, shoulder patch large, in large brown area between these grey markings several grey lines or elongate spots in interspaces III, V, VII, IX and X, a short streak also anteriorly on subbasal swelling.

Frons more than half as broad as rostrum (9 : 14). Antenna (♂) pale rufous, as are the legs, segment III a little shorter than IV, V to VIII gradually more flattened and a little longer, VIII longer than IX, club flat, IX and X more regularly triangular than in *I. rusia*, less than thrice as long as broad, X one-third broader than long, XI more regularly elliptical than in *I. rusia*, shorter, less narrowed towards base. Midtibia with mucro.

Sumatra : Medan (J. B. Corporaal), 1 ♂.

18. **Mauia rudis** sp. nov.

♂♀. Shorter than *M. subnotatus* Boh. 1859, and lateral carina of pronotum extended to near apical angle.

Rufescent brown, sides of head and of pronotum and anal segment paler, segments I and II of antenna and the legs pale rufous. Upperside with short, broad, scale-like hairs, not very close together, brown portions without these scales, namely the centre of head, median area of pronotum excepting rufescent markings, the suture of elytra and a variable number of ill-defined longish spots, about 12 on each elytrum. Pubescence of underside dense, silky, the hairs being thin.

Rostrum narrower than in *M. subnotatus* ; eye truncate anteriorly, not emarginate. Segment XI of antenna longer than IX. Pronotum two-thirds broader than long, i.e. shorter than in *M. subnotatus*, dispersedly granulate, lateral margin feebly incurved close to basal angle of carina.

Length : ♂ 2·5 mm., ♀ 2·7 mm.

Malay Peninsula : Kuala Lumpur, 8.xii.1934 (H. M. Pendlebury), 2♂♂, 1♀.

19. **Phloeomimus tenuipes** sp. nov.

Represents perhaps a distinct genus. Eye less coarsely granulate ; tarsi and shaft of antenna thinner ; basal margin of elytrum curved forward.

♂♀. Cylindrical, blackish brown, legs and base of antenna as well as mouth-parts rufescent or rufous. Upperside covered with buffish white pubescence, variegated with rather ill-defined white spots : on disc of pronotum 4 spots and on side a diffuse patch, on elytra alternate interspaces spotted, apex more extended white. Pygidium and underside white ; legs uniformly greyish white.

Antennal segments III to VIII thinner than segment II of maxillary palpus ; on that account club appearing much broader than in *Ph. griseus* Jord. 1908, but is only a little wider, segment IX as long as broad.

Pronotum less convex than in *Ph. griseus*, densely granulose ; dorsal carina not quite straight, being slightly convex each side.

Elytra densely granulose, with feebly marked rows of punctures, which are obsolete towards apex and side.

Tarsal segment I twice as long as the tibia is broad, the tarsi of the same type as in *Basitropis* Jekel 1855.

Length : ♂ 4·8, ♀ 3·7 mm. ; width : ♂ 1·8, ♀ 1·4 mm.

Java : Goenoeng Tsijsoeroe, Djampang, Preanger, 2,000 ft., xi.1934, 1 ♀, and i.1935, 1 ♂ (F. C. Drescher).

20. **Tropidobasis trigemmis** sp. nov.

♂♀. Antenna and elytra as in *T. bigemmis* Jord. 1932, but pronotum with a large black circular spot bordered with grey. Black, on upperside densely irrorated with grey, buff and brown, on underside grey pubescence prevailing. Rostrum very short, in front of eye only as long as frons is wide. Antenna rufous, segment III only as long as II is broad, IV and following gradually shorter, VI and VII as long as broad, VIII broader than VII, club compact, twice as long as broad, X transverse. Frons one-tenth narrower than club of antenna is long.

Diameter of black pronotal spot two-thirds the length of pronotum, the spot placed near apical margin, its distance from this margin only half the distance from dorsal carina, its grey border anteriorly more prominent than posteriorly. Scutellum buffish grey, much broader than long. The two spots of elytra as in *T. bigemmis* elliptical. Tibiae spotted with brown, in ♂ midtibia with apical hook.

Length: ♂ 3·9 mm., ♀ 4·3 mm.; width: ♂ 1·9 mm., ♀ 2·2 mm.

Singapore, 1 ♂ (type); North Borneo: Bettotan near Sandakan, viii.1927 (C. Boden Kloss & H. M. Pendlebury), 1 ♀.

21. **Tropidobasis synoris** sp. nov.

♂. General colouring as in *T. trigemmis* sp. nov., but pronotum as in *T. bigemmis* without round black spot. Apex of pronotum margined with greyish white; disc with an irregular, diffuse, transverse, brown area before middle. Scutellum grey, transverse as in *T. trigemmis*. Tibiae without brown spots; apical edge of midtibia, on underside, with a transverse, black, denticulated ridge, whereas in *T. trigemmis* there are two blackish teeth instead; hindtibia shorter than mid- and foretibiae. Abdomen flattened medianly.

Length: ♂ 4 mm., width 2 mm.

Malay Peninsula: Kuala Lumpur, v.1931 (H. M. Pendlebury), 1 ♂.

22. **Basitropis angustifrons** sp. nov.

♂. Remarkable for its very short rostrum, narrow frons and correspondingly large eyes, narrow and loose antennal club and the hooked fore- and midtibiae.

Rufescent brown, nearly three times as long as broad; pubescence grey, dense on underside, dispersed in patches and speckles on upperside, forming on pronotum a narrow median stripe which is widened in centre, and a largish patch before apical declivity of elytra and another behind subbasal callosities.

Rostrum three times as broad as long, with median carina, which extends on to frons. Head coarsely punctate. Eye very large, convergent, occiput therefore strongly narrowing frontad. Antenna rufous, segments IX and X conical, being narrowed to base, longer than broad, XI elongate elliptical, longer than IX and a little longer than III, VIII the shortest.

Pronotum rather densely punctate except apex, which is smooth. Elytra punctate-striate, the stripes feebly impressed.

Legs rufous, uniformly pubescent grey; fore- and midtibiae curved and hooked; all tarsi unusually slender.

Length: ♂ 6·0–6·7 mm.

Malay Peninsula: Buloh, 26.iii.1930 and 3.iv.1935 (M. L. Webb), 2 ♂♂, on *Pterocymbium* (*Sterculia*).

23. **Apolecta dilopha** sp. nov.

Belongs to the section in which the elytra are strongly convex at two-thirds, but differs from all known species of *Apolecta* in this convex portion bearing on each elytrum a large tubercle.

♂♀. Black, clothed with an ashy grey pubescence. Median carina of frons and rostrum broader and somewhat higher than the lateral carina, the latter not joining the median one but the interantennal transverse ridge, which is higher in ♂ than in ♀. Antenna with sparse short grey pubescence, which is more conspicuous on underside of segments I and II.

Pronotum laterally and posteriorly rather minutely granulate, median area depressed, especially before carina, middle itself elevate as in the allied species, a black median stripe widest behind centre, continued across head to rostrum, a less distinct lateral stripe interrupted in middle ; dorsal carina deeply incurved in middle, the vertical space between carina and basal edge much narrower than the scutellum.

Elytra broadly depressed from subbasal callosity to tubercle, irregularly speckled with small brownish black spots, tubercle black, placed in third interspace, which is here widened, the black colouring extending towards suture and laterally to interspace VII, forming a transverse band more or less interrupted at suture and laterally broken up into spots. Pygidium dispersedly punctate-granulate, slightly depressed at apex, with brownish black median stripe.

Underside very distinctly punctate, uniformly, but not very densely ashy grey, as are the legs. Tip of tibiae, especially on inside, and the whole upperside of tarsi brownish black. Abdominal segment I of ♂ without tubercle.

Length : ♂ 6·5 mm., ♀ 7·0 mm.

Malay Peninsula : Rotan Tunggal, F.R., 10.iv.1933 (F. G. Browne), 1 ♂, type ; Selangor, Anipang, x.1932 (Tweedie), 1 ♀.

24. **Apolecta latipennis** Jord. 1916.

Nov. Zool. xxiii, p. 343, no. 3 (1916).

Described from a single ♀. Mr. H. M. Pendlebury has sent me a small ♂ obtained by him at Fraser's Hill, Pahang, 3,500–4,500 ft., August 1923, which agrees very well with the ♀. The derm is not quite fully coloured, being more or less rufous, basal two-thirds of segments III and IV of antenna especially pale. Clay-coloured spots more rounded than in ♀.

Length : ♂ 8·5 mm.

25. **Apolecta malayana** sp. nov.

♀. Close to *A. enganensis* Jord. 1897. Outer dorso-lateral clay-coloured stripe of pronotum interrupted. Elytra at posterior third somewhat more convex, particularly interspace III, here a black patch on III and IV, extending to suture and to interspace V, connected with spot in VI, depressed sutural arc more extended black than in *A. enganensis*, whereas the dark markings of rest of elytra reduced. Brown median stripe of pygidium a thin line which widens at apex. Upperside of tarsi black, whereas in *A. enganensis* segments I and IV are white except at apex.

Length : ♀ 7·5 mm.

Malay Peninsula: Cameron's Highlands, Pahang, 4,500–5,000 ft., 14.vi.35 (H. M. Pendlebury), 1 ♀.

Oxyconus gen. nov.

♀. Near *Araecerus* Schönh. 1835 and *Misthosima* Pasc. 1859. At some distance from antennal groove an anguliform carinula, the angle obtuse and somewhat rounded, anterior portion of this carinula directed obliquely forward, being nearly parallel to lateral margin of proboscis, posterior portion of carinula directed obliquely towards eye and backwards, remaining separate from eye to occiput, where it fuses with rim of eye. Frons somewhat convex. Eye entire. Antenna longer than in *Araecerus*, bristles short, segments III and VIII shorter than IV to VII, club narrow, not wider than segment II, asymmetrical, segments IX and X narrowed at apex, not truncate, the three segments of club alike in length, two together a very little longer than the frons is broad.

Pronotum distinctly inclining forward, lateral angle compressed, prolonged along shoulder, appearing very acute in dorsal aspect, carina basal, not subbasal, its lateral angle sharp, measuring about 45°. Elytra, meso-metasternites and abdomen together elongate-conical, gradually tapering from convex base of elytra to tip of abdomen, pygidium about one-fifth longer than broad, its tip slightly reflexed. Segment I of tarsi about one-third longer than II to IV together. One species.

26. **Oxyconus stipinus** sp. nov.

♀. Rufescent brown, pubescence lutescent grey, almost uniformly covering the body, not very dense, without distinct markings, on pronotum a large space before carina more brown, with a median stripe and on each side a rounded patch more densely pubescent grey, inconspicuous; legs and base of antenna rufous.

Head and pronotum reticulate, the meshes larger than in *Araecerus fasciculatus* Deg. 1775. Antenna reaching to basal third of elytrum. Prothorax not quite twice as broad at base as at anterior margin, one-third broader at base than long, side slightly convex, dorsal carina rounded-angulate in middle, following the rather strong curve of the basal margins of the elytra, lateral carina extending a little beyond one-third. Elytra nearly twice as long as broad, broadest close to basal projecting angle of prothorax, strongly and evenly convex near base, without subbasal humps, coarsely punctate-striate. Pygidium with dispersed granules.

Sides of sterna coarsely and deeply punctate, no punctures on prosternite immediately below carina; on sides of segments I and II of abdomen basal, median and apical punctures, these obsolescent on III and hardly traceable on IV.

Length: 3·6 mm., width 1·3 mm.

1 ♀ from Takar, Dutch New Guinea, received from H. Fruhstorfer.

Araecerus mordellinus Jord. 1924 is similar in shape of body, but has the eye minutely sinuate, the club of the antenna broad, antennal segment III much longer than IV, stripes of elytra vestigial, tarsal segment I shorter than II + III + IV, etc. In *Araecerus eudelus* Jord. 1928, which is much less conical than *O. stipinus*, the angle of the pronotal carina and the basal angle of the prothorax are nearly as acute as in the new species, but in *A. eudelus* the carinula at the margin of the antennal groove and the antenna are of the *Araecerus* type.

ANTHRIBIDAE FROM SOUTH AMERICA AND AFRICA.

By DR. KARL JORDAN, F.R.S.

1. **Sistellorhynchus plumbicolor** sp. nov.

♂♀. In shape similar to *S. posticalis* Blanch. 1851, but uniformly pubescent plumbeous, and each elytrum with a subbasal and a postmedian longitudinal swelling in third interspace, without any other tubercles. Black, the plumbeous pubescence not entirely concealing the derm. Dorsal surface of rostrum concave in apical half, with a faint indication of a median carina. Head rugate-reticulate. Antenna as in *S. posticalis*.

Pronotum conical from middle, about one-tenth broader than long, medianly longitudinally rugate-plicate, laterally rugate-reticulate, somewhat depressed along dorsal carina, otherwise evenly convex ; carina concave from side to side, very slightly convex dorso-laterally.

Elytra one-half longer than broad, strongly punctate-striate, the punctures very conspicuous, subbasal swelling restricted to third interspace, elongate, not much raised, crowned with black hairs, a similar postmedian tubercle in the same interspace ; about median third of interspaces IV to VI somewhat widened and convex, sometimes uneven. Pygidium finely coriaceous, one-fourth broader than long, almost evenly rounded.

Prosternum coarsely punctate ; convex portion of metasternite impunctate ; abdomen impunctate apart from a row of large punctures at bases of segments ; middle flattened in ♂. Tibiae brown, median third grey.

Length : 3·9–4·5 mm.

Chile, a small series.

2. **Acorynus anthinus** sp. nov.

♂. In shape not unlike *Tropideres pallidirostris* Fåhrs. 1839, but rostrum without distinct carinae, and pronotum not punctate.

Brownish black, derm of part of elytra and legs green, pubescence grey, buff and black. Rostrum strongly widened at apex, very little longer than broad, flattened, very densely rugulate-coriaceous, without distinct carinae, median one absent, dorso-lateral one vestigial. Frons one-third as wide as apex of rostrum, brown like rostrum, with two small grey dots at eye, a very thin median carina distinct, extending on to occiput, but not on to rostrum ; occiput brown, with grey median spot and grey eye-border. Cheek with triangular white spot. Antenna reaching beyond base of elytra, extreme bases and tips of segments I to VII pale rufous, VIII and greater proximal portion of IX rufous, III longer than IV, IV to VII nearly alike in length, VIII somewhat shorter and like VII apically broader than the preceding segments, compressed, IX triangular, not quite thrice as long as broad, as long as III, X transverse, XI subovate, somewhat acuminate. Eye circular, broader than frons.

Pronotum three-fourths broader than long, very densely and minutely granulate-coriaceous, with broad transverse depression, without humps, black, variegated with ill-defined buff markings as follows : a median stripe, narrowing

in front, but here connected with subapical buff pubescence, broadish before carina and here enclosing two small black dots, on lateral area four or five spots partly joined together, base behind carina also buff, with two black spots each side ; carina with faint indication of median angle, laterally flexed forward in a short, strongly curved arc. Scutellum buff.

Elytra oblong, a dorso-lateral irregular broad stripe of the derm green from base to near apex, seriated punctures large, sutural interspace flat, the others more or less convex, especially III on apical declivity, this ridge ending abruptly, IX also with an obtuse subapical ridge, much lower than that of III, both ridges terminating at about the same distance from apex, whereas the slightly convex portions of the intermediate interspaces extend less far apicad ; subbasal swelling raised into a prominent obtuse tubercle ; sutural interspace buff, this stripe slightly widened before and behind middle and more so at apical margin, interspaces IX and X buffish grey from large lateral posthumeral black patch and bearing four black equidistant dots, the following markings also black : a patch on tubercle extending to basal margin at side of scutellum, a median double spot in interspaces II and III, whence runs a thin line forward in the direction of shoulder, which it does not reach, and a row of spots slightly backwards towards outer margin, in interspace I a minute dot between those subsutural spots, before apical declivity a transverse band to interspace VII, interrupted at suture, the spots composing it longest in III, V and VII, a small ring on shoulder-angle and a minute dot in V on a level with posterior portion of tubercle ; in between these black markings grey pubescence (partly rubbed away in the unique specimen). Pygidium buff, much broader than long, apical margin round at sides.

Underside buff at side of sterna and at black lateral spots of abdomen, sterna with black lateral spots, the two of prosternum merged together, rest of underside grey. A subapical ring or spot on femora, a basal spot and a median one and a broad apical ring on tibiae, apical two-thirds of tarsal segment I and the whole of III and IV, except rufous claw, black.

Length : 4·4 mm. ; width : 2·4 mm.

Kenya : Nairobi, vii. 1930 (Dr. van Someren), 1 ♂.

The species has close affinities with *Tropideres* Schönh. 1826 and *Homoeotropis* Kolbe 1895, into which genera it might be placed with as much right as in *Acorynus* Schönh. 1833. In a revision of the African and Oriental species now in *Acorynus* probably no African species will remain in *Acorynus*, and as I have provisionally united *Homoeotropis* with *Acorynus*, it is advisable to put the present new species also into *Acorynus*.

3. **Blaberops asemus** sp. nov.

♂♀. Similar in shape and colouring to *B. macrocerus* Jord. 1904, but club of antenna much broader, lateral carina of pronotum longer, tarsi shorter.

Brownish black, pubescent greyish white, irregularly and diffusely variegated with brown, without distinct spots, pubescence of underside much less dense on prosternite and abdomen than in *B. macrocerus* ; antenna and legs rufescent. Rostrum flat in both sexes, apex not impressed in ♂ as it is in ♂ of *B. macrocerus*. Antenna of ♂ about one-fourth longer than body, segments III to VIII nearly alike in length, IV being slightly shorter, VIII somewhat broader apically than the preceding segments, club broad, hairy beneath, IX as long as VIII or nearly, not quite thrice, X less than twice and XI twice as long as broad, XI irregularly

elliptical, sides slightly incurved beyond middle ; in ♀ reaching to base of elytra, IV, V and VII about equal in length, VI and VIII somewhat shorter, III a little longer, IX slightly longer than III, half as long again as broad, triangular, X one-ninth longer than broad, rounded-angustate towards base, XI as long as IX, ovate, with broad base.

Pronotum very densely reticulate-rugate, greyish white pubescence somewhat denser at side and behind carina, half-way to side a brown basal spot ; dorsal carina a little nearer base than in *B. macrocerus*, lateral carina extending forward, but not reaching middle.

Elytra somewhat longer than in *B. macrocerus*, more distinctly punctate-striate, basal margin truncate, not incurved from shoulder to shoulder. Segment I shorter than II to IV.

Length : ♂♀ 3·6–4·0 mm. ; width: 1·4–1·6 mm.

Congo Belge : Lomami–Kaniama, iii.–iv. 1932 (R. Massart).

Noxius nom. nov.

Blaberus Schönh., *Gen. Curc.*, v, p. 248 (1839) (genotype : *B. fallax* Fahrs. 1839) nec *Blaberus* Audin.-Serv., *Ann. Sci. Nat.*, xxii, p. 37 (1831), a genus of *Orthoptera*.

The name *Blaberus* being here occupied, I replace it by its Latin equivalent. *Noxius* differs from *Blaberops* especially in the forecoxae being farther apart and in the ♂ antenna not being prolonged.

4. **Syntophoderes cymatias** sp. nov.

♂♀. Like *S. guineensis* Kolbe 1895, easily overlooked. Club of antenna narrower, especially end-segment. Dorsal double impression of pronotum deeper, in front of carina broader, the humps flanking it higher, dorsal carina much more convex laterally, and lateral carina longer ; subbasal hump of elytrum higher ; pygidium nearly twice as broad as long, anal sternite much shorter than III + IV ; chitin of tarsi pale rufous. Midtibia of ♂ without apical tooth ; hypopygidium broad, rounded-truncate, sinuate in middle, quite different from that of any other known species of the genus, the nearest approach being found in *S. simplicipes* Jord. 1931, in which the midtibiae are unarmed as in the new species; Externally *S. simplicipes* is easily distinguished from *S. cymatias* by the above. mentioned differences in the club of the antenna and the pronotum.

Congo Belge : Lulua, Kapanga, ix. 1921 and x. 1932 (F. G. Overlaet), 1 ♂, 1 ♀; Kiva, Nyamlagira, ix. 1932 (L. Burgeon), 1 ♀.——Type (♂) in Musée du Congo Belge, Tervueren.

5. **Pseudeuparius trifax** sp. nov.

♂♀. Similar to *Ps. monocerus* Fahrs. 1839, but pronotum without median tufted hump. General colouring nearly the same as in *P. monocerus* and *P. centromaculatus* Gyllh. 1833. Disc of pronotum swollen laterally, the swelling nearer to side than to middle, remaining distant from apical margin and basal depression, laterally bounded by white pubescence, lateral surface almost vertical, central area of pronotum feebly convex, almost flat, before middle with a transverse curved whitish line, convex anteriorly, bounded in front by a brown line or band and followed by a more or less interrupted brown band, anticarinal depression brown, from apex to centre a thin white median line, or an indication

of it. Interspaces III, V, VII and IX of elytra with the pubescence somewhat raised and dotted with brown, as is also apical portion of sutural interspace, subbasal swelling with a black spot anteriorly ; before middle a sutural ellipse touching interspace V on each elytrum, longer than broad, its periphery formed by a black line in the typical form and the interior clayish grey, in a second form the whole ellipse is black, in a third form the whole ellipse is greyish clay-colour and the black peripheral line absent or indicated by a vestigial ochraceous line ; from shoulder to apex a diffuse sublateral blackish stripe. Tibiae with two brown spots.

Length : ♂♀ 3·3–4·4 mm.

East Africa, probably Tanganyika Territory, a small series.

6. **Anaulodes oligus** sp. nov.

♂. Similar to *A. cylindricus* Kolbe 1895, without markings, pubescence sparser, especially beneath. Rostrum as in that species. Sinus of eye somewhat larger. Antenna a little longer, segment IX narrower than X, XI the broadest, twice as long as broad. Puncturation of underside much less dense, which is particularly noticeable on abdomen. Anal sternite simple.

Length : 4·5 mm.

Abyssinia (Raffray), 1 ♂.

7. **Anaulodes artius** sp. nov.

♂♀. Like *A. cylindricus* Kolbe 1895, densely pubescent grey ; on elytrum two rufescent brown dorsal patches, the first before middle, longer than broad, quite diffuse in ♂, second before apical declivity, larger, subtriangular in ♂, almost square in ♀. Rostrum shorter, apical margin distinctly incurved. Eye without sinus. Antenna of ♂ with segments IV to VI broad and thick, broader than club, strongly narrowed to base, triangular in outline, more enlarged forward than backward, IV somewhat longer than V and this a little longer than VI, which is as long as broad, other segments normal, but slightly shorter than in ♂ of *A. cylindricus* ; ♀ antenna normal. Pygidium in both sexes at apex with short median carina which projects as a small tooth. Abdomen somewhat flattened in ♂, anal sternite simple in both sexes.

Length : ♂ 5·8 mm., ♀ 6·2 mm.

Zanzibar (Raffray), 1 ♂, 1 ♀.

Apical margin of rostrum, eye, pygidium and ♂ antenna distinguish this species from all others.

ON TWO SOUTH AFRICAN *CHARAXES* (LEPID., NYMPHALIDAE).

BY DR. KARL JORDAN, F.R.S.

THE majority of the specimens on which this paper is based are in the Hope Department of the University Museum, Oxford, and were submitted to me for study by my friend Sir Edward B. Poulton, F.R.S. The material of the two species dealt with contained in the British Museum (Nat. Hist.) and at Tring has also been compared, and, in addition, Mr. John Levick has kindly shown me the specimens of *Ch. xiphares* of the Oberthür collection. Though the number of specimens available, therefore, was not inconsiderable, exact data as to locality were missing in many cases and for that reason my exposition of the various *xiphares*-races must be regarded as tentative only.

1. **Charaxes xiphares** Cram. 1781.

The description we gave of this species in NOV. ZOOL., vii, p. 377 (1900), was taken from Natal specimens; at that time we had not seen any examples from Cape Province and evidently looked upon Stoll's figure as being incorrect in the detail of colouring. It has been known to me for some time that Stoll was right and that our description applied only to one race of the species. The discovery of two subspecies in Transvaal, described by Mr. van Son (1935) and Sir E. B. Poulton (1929) respectively, and the receipt, from another locality in Transvaal, of specimens which did not exactly agree with either, were the main reasons for comparing, at the request of Sir Edward, the material in the collections mentioned above. The species is confined to forest country and evidently not easy to procure, as the number of specimens in collections is small, although the species is said, or, rather, was formerly said, to be fairly abundant in certain localities. Its restriction to isolated wooded localities and, in its northern range, to wooded mountains probably accounts for the development of the four geographical races into which the species is broken up.

(*a*) **Ch. xiphares xiphares** Cram. 1871.

♀. *Papilio Eques Achivus xiphares* Cramer, *Pap. Exot.*, iv, p. 171, pl. 377, fig. A.B. (1781) (Cap. b. sp.).
♂. *Papilio Eques Argonauticus thyestes* Stoll, in Cram., *Pap. Exot. Suppl.*, p. 144, pl. 32, fig. 2, 2B (1).

♂. *Upperside.* Forewing: two blue spots outside apex of cell, anterior one linear, 3 to 4 mm. long, second trapezoidal, nearly twice as long as broad, discal spot M^1–M^2 incised outwardly, its lower projection reaching (or nearly) to submarginal dot. Hindwing: subcostal section of discal band consisting of a small blue outer bar and a rounded proximal spot which is anteriorly white; admarginal bars *blue*.

Underside. Forewing: a patch outside apex of cell and a discal band of three patches grey, corresponding to the white patches of ♀, posterior one of these patches a very large comma and nearly white; submarginal area bounded by postdiscal row of lunules grey.——Hindwing: discal band nearly as pale as in ♀, submarginal and marginal areas much shaded with grey; in both fore- and hindwing the light colouring strongly contrasting with the brown ground.

♀. *Upperside.* Forewing: discal white patch M^1 M^2 reaching to postdiscal row of dots; between this patch and posterior margin three spots, first white, usually accompanied on outside by a buff postdiscal dot, second vestigial, with a postdiscal bar on its outside, third largish, diffuse, buffish, placed at hindmargin. ——Hindwing: admarginal bars ochraceous, not blue as in ♂; discal band always buff.

Underside. Submarginal area on both wings, but particularly on hindwing, more extended grey than in specimens from Natal and Transvaal. Forewing: the two black postdiscal bars separating the white patches from the ochreous lunules thin, usually the large white patch M^1–M^2 extended to the ochreous lunules or even to the black submarginal spots.——Hindwing: white discal band hardly at all shaded with brown, wider from lower median vein M^2 to abdominal margin than in Natal specimens.

Cape Province: Knysna and places farther west.

(*b*) **Ch. xiphares elatias** subsp. nov.

♀♂. *Charaxes xiphares Cram.*, Roths. & Jord., *Nov. Zool.*, vii, p. 376, no. 32 (1900) (partim).

♂. The same size as the previous subspecies. *Upperside.* Forewing: blue spots of oblique median row smaller than in *Ch. x. xiphares*, spot M^1–M^2 widely separate from postdiscal dot, the double spots in submedian cellule also smaller. ——Hindwing: subcostal section of blue band consisting of two spots, inner one the larger, sometimes as large as in *Ch. x. xiphares*, but entirely blue or with the white much restricted.

Underside paler in some specimens than in others, but the whitish-grey band on the outside of the black and white discal bars of fore- and hindwing, which is so conspicuous in *Ch. x. xiphares*, indicated only, submarginal areas of both wings and interspace between the black and white subbasal and submedian bars of hindwing also less washed with grey.

♀. *Upperside.* Forewing: white patch outside apex of cell larger than the one following, last white patch of this oblique median row smaller than in *Ch. x. xiphares*, no white spot below this patch; middle and posterior dots of postdiscal row at most indicated.——Hindwing: median band buff as in *Ch. x. xiphares.*

Underside. Forewing: black and white antemedian bar in cellule 2 more proximal (i.e. at some distance from base of M^1) than in *Ch. x. xiphares* (as is also the case in ♂), posterior large white patch of oblique median row smaller (as it is above) and usually the black interspace between it and the ochraceous bar much wider than in *Ch. x. xiphares.*——Hindwing: white discal band outwardly more or less shaded with brown, sometimes only the white bars bordering the band on proximal side remaining white, last section of band from M^1 to abdominal margin narrower than in *Ch. x. xiphares.*

West Pondoland, Natal, Zululand.——Type ♂ from St. John's district, W. Pondoland, v. 1908, at Tring.

(*c*) **Ch. xiphares draconis** subsp. nov.

A large edition of the next race; smaller than the previous ones in both sexes.

♂. *Upperside.* Forewing: discal blue patch M^1–M^2 somewhat larger than in *Ch. x. elatias*, oblique; upper postdiscal dot white, second shaded with blue, the others blue as in the previous races. ——Hindwing: subcostal section of blue

discal band broader, last section obscured, with its distal portion separated as a postdiscal spot, the division of the band into its original components (discal and postdiscal spots) indicated also farther forward, no pale scaling below M^2, the submedian area being brownish black, darker than in the previous races, abdominal margin lighter ; admarginal bars ochreous, somewhat obscured by black scaling.

Underside. Forewing : in one specimen (type) the black and white bars much more prominent than in the other (which also has shorter tails), in both the first postdiscal dot smaller than in *Ch. x. elatias.*

♀. *Upperside.* Forewing : tripartite anterior patch of oblique white band smaller in comparison with the discal patches than in *Ch. x. elatias*, the discal patches nearly as in *Ch. x. xiphares*, the last almost a parallelogram, below it one or two white spots, the anterior two dots of postdiscal row conspicuous, white, the next two more or less distinct, the others absent.——Hindwing : discal band either buff as in the previous races or white with a bluish tint ; in the buff form the band much broader, its second section measuring 11 to 13 mm. in length, in the white specimen only 9·5 mm.

Underside. Forewing : antemedian bar in area 2 close to base of M^1 as in *Ch. x. xiphares* ; triangular white discal patch, divided by the submedian fold, larger and more sharply defined than in *Ch. x. elatias.*——Hindwing : discal band more densely shaded with brown than in any *Ch. x. elatias* I have seen, only the bars which form its proximal border remaining white, subbasal interspace between the two lines of bars not paler than basal area, the white border of these bars not enlarged ; black bars of postdiscal halfmoons weak, the anterior ones more or less effaced, particularly the outer bars ; white submarginal bars also weaker than in the previous race.

Length of forewing : ♂ 43·5 mm. ; ♀ 49–52 mm.

Transvaal : Marieps Mt., south of Olifants R., 4,500 ft., 24° 35′ S., 30° 50′ E., 2♂♂, 3 ♀♀ collected by G. van Son, March 1932.

(*d*) **Ch. xiphares kenwayi** Poult. 1929.

Charaxes xiphares kenwayi Poulton, *Proc. R. E. Soc. Lond.*, p. 48 (1929) (Haenertsburg).

♂. Not known to me.

♀. Like *Ch. x. draconis*, smaller. *Upperside.* Forewing : discal patch R^3–M^1 more trapeziform and the next patch a little longer than in *Ch. x. draconis*, dots 4 to 8 of postdiscal row traceable in one specimen (type), more distinct in other.——Hindwing : band either white, anteriorly and outwardly slightly shaded with buff (type), or creamy white, anteriorly more strongly shaded with buff.

Underside. Hindwing : discal pale band white on proximal side, the brown shading not extending everywhere to the white bars ; subbasal bar in front of cell vestigial or absent.

Length of forewing : 46 to 47 mm.

Transvaal : Haenertsburg, Drakensberg district, north of Olifants R., 23° 60′ S., 30° E, 5,000 ft., 2 ♀♀ collected by H. Cecil Kenway, Dec. 1926.

(*e*) **Ch. xiphares bavenda** van Son 1935.

♂♀. *Charaxes xiphares bavenda* van Son, *Ann. Transv. Mus.*, xv, p. 487, text-fig. 2, ♂ (1935) (Entabeni).

♂. *Upperside.* Hindwing : according to the photograph published by Mr. van Son, the subcostal section of blue band more widely separated than in

Ch. x. draconis, and the band without the black spots which, in *Ch. x. draconis*, indicate a division into discal and postdiscal spots (in *Ch. nandina* Roths. 1901 there is a row of postdiscal spots some distance from the discal band) ; the band described as being much lighter than in previous races, " somewhat resembling that of *Ch. cithaeron*."

♀. *Upperside.* Hindwing : band either creamy buff shading outwardly into isabella colour, or deep lavender with the outer edge brown. In a third colour-form (one specimen) the discal patches of forewing washed with brown instead of being pure white, and the band of hindwing horny-yellow. In the specimen before me the discal band of upperside of hindwing buff, on underside the band shaded with brown.

Transvaal: Entabeni, Zoutpansberg district, about 23° S., 30° E., described by van Son from 1♂, 5 ♀♀, collected by himself in Nov. 1931.

Further research based on a larger material may possibly prove that the three subspecies from the Transvaal, all dimorphic in the ♀♀, belong to a single subspecific population.

(2) **Charaxes druceanus moerens** subsp. nov.

♂♀. *Upper-* and *Underside* darker than in *Ch. d. druceanus* Butl. 1869, from Natal, the tawny (♂) or pale buff (♀) discal band of forewing narrower, the post-discal costal branch of this band more distinctly divided into spots. Very near *Ch. d. kivuanus* Jord. 1925, differing as follows :

♂. *Upperside.* Tawny discal band of both wings somewhat narrower, especially on hindwing.

Underside. Forewing : anterior black submarginal spots each edged with a metallic bar more distinct.——Hindwing : tawny antemedian band from costal margin to cell narrower, silvery median band divided by a tawny costal spot which is continued backwards by a nearly complete line or by an indication of a line ; black reniform ring of anal lobe smaller.

♀. *Upperside.* Discal band of both wings paler than in ♂ of *Ch. d. druceanus* (♀ of *Ch. d. kivuanus* not known), outer costal branch of this band broken up into spots and proximal costal branch narrower than in *Ch. d. druceanus*, sometimes also broken up into isolated spots.

Underside. Hindwing : silvery median band usually divided by a dark stripe running from costal margin backwards ; in area 4 three silver-bordered black bars, first in cell, second on discocellular, anteriorly joining the first, third in silver-band, between these bars two tawny spots, the outer one of them absent from *Ch. d. druceanus* ; outer margin of median silver-band more convex above middle than in *Ch. d. druceanus*, as is also the silver-line placed between it and the submarginal line of silver and black bars.

Transvaal : Marieps Mt., Drakensberg district, 24° 35′ S., 30° 50′ E., about 4,000 ft., a series of both sexes collected by H. Cecil Kenway, March 1931, in heavy forest facing south ; in Tring Museum also a ♀ from Shilouvane, collected by H. Junod, May 1901.

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