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NOVITATES ZOOLOGICAE.

Vol. VII., 1900.





# NOVITATES ZOOLOGICAE.

A Journal of Zoology

*IN CONNECTION WITH THE TRING MUSEUM.*

EDITED BY

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ERNST HARTERT, AND DR. K. JORDAN.

VOL. VII., 1900.

*(WITH TWELVE PLATES.)*

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# NOVITATES ZOOLOGICAE.

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No. 1.

## THE BIRDS OF RUK IN THE CENTRAL CAROLINES.

### ERRATA.

- Page 26, line 18, for "**Corythaeala**" read **Corythaeola**.  
,, 35, line 7 from the top, for "**Melitta**" read **Melittophagus**.  
,, 41, line 3 from the bottom, for "**Lagonostica**" read **Lagonostieta**.  
,, 339, line 3 from the top, for "**Copsychns salamis**" read **Copsychns saularis**.  
,, 357, line 12, for "**Philagnoma**" read **Philognoma**.  
,, 534, line 14, for "**Lyons**" read **Lyon**.  
,, 541, line 3 from the bottom, for "**Columba oeneas**" read **Columba oenas**.

ABOUT three years ago the same very able Japanese collectors of our correspondent, Mr. Alan Owston, in Yokohama, who collected so successfully on Guam and Saipan in the Marianne Islands,\* proceeded to Ruk and sent a large collection to Tring.

The most important feature of this collection is the new *Tephros* (No. 3), and the very fine series of nests and eggs of nearly all the species inhabiting the island.

The notes on the colours of the soft parts are all given from Ridgway's *Nomenclature of Colours*, and we may say that we have found them most accurate. The nests and eggs were also labelled with the greatest care and accuracy. Out of many hundreds of nests and eggs in the two collections we could not trace one error, and had only one doubtful egg of a Tern, which is not mentioned in either list.

To enable a reader of this article to inform himself of the entire bibliography on the species, I have to all the species added the no. and page of Wilesworth's

\* Cf. Nov. Zool. V. p. 51.

most accurate and useful work *Aves Polynesiae*, in *Abhandl. & Berichte Mus. Dresden* 1891.

The literature on the birds of Ruk Island is thus briefly summarized :—

1853 : Hombron and Jacquinot in *Voy. Pôle Sud. Atlas*, Jacquinot & Pach, *Zool.* v. III.

1880 : Finsch, *P. Z. S.* pp. 574-77 (Birds of Ruk).

1891 : Wilesworth, *Aves Polynesiae* p. VII. (List of Caroline Birds).

1897 : Hartert, *Bull. B. O. Club* VII. p. 5 (*Tephros ruki*).

1899 : Nehrkorn, *Katalog d. Eiers.* (Descr. of some Eggs).

### 1. *Myzomela rubrata* (Less.) (Wilesworth No. 131, p. 31).

Evidently very numerous on Ruk Island. Its native name is "*Nitekabal*." "Bill black (Pl. II. fig. 1, Ridgway's *Nomencl. Col.*) ; iris burnt umber (Ridgway III. s) ; legs and toes slate-grey (II. 5) ; claws black."

Nov. Zool. V. p. 55, I have said that *females* differ from the *males* not only in size, but also in having olive-brown wings and greenish olive edges to the remiges. I find now, however, that these are characters of immature *females* only, and that the fully adult *female* differs from the *male* only in its smaller size, and generally in a somewhat more restricted extent of the red on the back and abdomen.

Many nests were found from the end of May to July, and one in March. The nests and eggs are described in Nov. Zool. V. p. 56. On Guam they were collected in January, February, and March.

### 2. *Zosterops semperi owstoni* subsp. nov. (Wilesworth No. 183, p. 37, *partim*!).

The greenish *Zosterops* of Ruk, hitherto united with typical *Z. semperi* from the Pelew Islands, is, in fact, different. As all the land-birds of Ruk, except the widespread *Myzomela rubrata*, are more or less different from those of the Pelew Islands, this is not at all remarkable. The differences, however, are so slight, that I prefer to regard them as representative forms of one species, and to designate the Ruk form as above, as a compliment to Mr. Alan Owston, of Yokohama, who organized the collecting expedition to the Marianne and Caroline Islands for Mr. Rothschild.

*Z. semperi owstoni* differs from *Z. semperi semperi* in the following characters : The colouration of the upperside is less yellowish, but more green. The ear-coverts are more olive-greenish than in *Z. semperi semperi*, where they are paler and more yellowish. The spot on the lores and under the fore part of the eye, which is indistinct and dusky, is pure black and more distinct. The whitish edge on the inner web of the outer rectrices is less developed. The upper bill, which is horn-brown in *Z. semperi semperi*, is black. We have received a large series from Ruk, which I have compared with three Pelew specimens, kindly lent by the authorities of the Liverpool Museum, and two in the Tring Museum, collected by the late Mr. Kubary. The collectors have marked the upper bill as "pure black, iris raw-sienna (Ridgway V. 2) ; feet pale slate colour." The native name is "*Nikikitebn*."

Nests with single eggs were found from May to July. They were placed in various heights, but generally between four and eight feet high, in various bushes and trees. They are very neatly woven of fine halms and fibres, and outside nicely ornamented with cobwebs and white cocoons or wool. Some hang in the fork of a

twig, exactly like an Oriole's nest. The eggs are pale blue, like all *Zosterops* eggs, and measure: 17.5 : 12.8, 17.7 : 12.5, 18 : 12, 16.5 : 12, 17.6 : 13, 17 : 12.3 mm.

*Zosterops conspicillata* of Guam lays generally two and even three eggs. The fact that so many Passeres on the Pacific Islands lay only one egg is commented on by Wigglesworth in "*Aves Polynesiae*" p. V., where this noticeable fact is explained as a "remarkable preventative of a too rapid multiplication."

### 3. *Tephras ruki* Hart. (*Bull. B.O. Club* v. VII. p. 5, October 1897).

Entirely sepia-brown, a shade darker on the crown, the outer edges of the inner webs of the remiges and the under wing-coverts paler, the former inclining to whitish; the primaries darker, almost black, their outer webs bordered with the colour of the back. No complete white ring, but a narrow semi-ring round the eye, only visible in well-skinned specimens. Bill black, legs and feet light orange-rufous; claws brown, iris poppy-red. Total length about 135—148 mm.; wing 78—83, tail 52—53, bill 15—17, culmen from forehead 21, metatarsus 21. The sexes do not seem to differ, unless the *female* is a little smaller than the *male*.

The native name is "Nikildon."

Only eight specimens were obtained in November and December. It is most peculiar that the late J. Kuby, who was an excellent collector, and who spent more than fourteen months on Ruk, did not obtain this bird. It is probably not numerous, and occurs only on a certain secluded spot not visited by Kuby.

I have provisionally accepted Hartlaub's generic term *Tephras*, because I think this group may with advantage be separated from the host of *Zosterops*.

*T. finschi*, the type of *Tephras*, and *T. ruki* agree and differ from typical *Zosterops* in the following characters:—the first primary, which in typical *Zosterops* is quite reduced and not visible from below, is well developed and visible from below (7 mm. in *T. finschi*, 10—11 in *T. ruki*), the bill is longer, the feet (especially in *T. ruki*) very strong, the colouration almost uniform brown. I do not know if *Zosterops cinerea* and *Z. ponapensis* belong to this same group, but I doubt it, because (judging from the figures) they have the typical Zosteropine bill, although in the style of colouration they are like *Tephras*.

*T. finschi* differs from *T. ruki* in its much smaller size and lighter under-surface.

### 4. *Acrocephalus* (*Tatare of many authors*) *syrinx* (Kittl.).

(Wigglesworth No. 209, p. 41).

We have received a large number of specimens. *Females* do not differ from *males*, except in being slightly smaller: wings of *males* average 80—81 mm., of *females* 76—77 mm. Young birds do not differ from adults, except in being somewhat lighter and more yellowish. In November, especially in the latter half of this month, a good many were in moult. "Iris mars-brown (Ridgway III. 13); upper bill brownish slate-colour, lower cream-colour. Legs and toes dark grey. Length in the flesh about 6.7 inches."

Many nests, most of them containing one fresh egg, some two, were found from the end of May to the beginning of July. They stand on bread-fruit, cocoanut-palm, and ivory-palm trees, and in bushes, in a height from about 7 to 20 feet. The nests are strongly woven together and constructed of dry grass, fibres of cocoanut palms and other fibres, dry leaves and similar material,

and form a very deep cup, like nests of other Reed-warblers. They are, however, evidently *not* hanging up on reeds or twigs, like those of our *Acrocephali*. The eggs are white, covered with darker and lighter brown patches and smaller spots, and underlying ashy grey or lavender-grey spots. These spots are generally thicker near the broad end, sometimes forming a loose ring, and they are sometimes equally spread over the whole surface. Four dozens measure: 24:15.7, 23:16, 25.2:18, 21.5:16.2, 22.5:15.9, 21.5:16.2, 21.5:16.1, 21.5:15.7, 24:15, 22.5:16.4, 23:16, 22:15.1, 22.5:15.7, 22:16, 23:16, 22.5:16.5, 22.5:16.5, 22.5:15.5, 22:16, 20.5:17, 21:16.1, 22:16.1, 20.7:16.1, 23:15.6, 22:21.5, 23:16, 21.6:16.3 mm., and so on. Nehrkorn, *Kat. Eiersamml.*, p. 33, gives 21—23:15 mm., and mentions the whitish (instead of greenish) ground-colour.

##### 5. *Metabolus rugensis* Hombr. & Jacq.

(Wiglesworth No. 71, p. 19: *Cat. B. Brit. Mus.* IV. p. 238; Finsch, *P.Z.S.* 1880 p. 575.)

The extraordinary sexual dimorphism in the colouration of this bird, and the colour of their young has not been fully understood. In the *Catalogue of Birds* (IV. p. 238), the adult *male* is correctly described as white with black throat and forehead, and partly blackish shafts to the rectrices and remiges. The adult *female*, however, is not correctly described in that work. What is described there as the adult *female* is evidently a young *female* changing to the adult dress.

The admixture of white on the abdomen and under tail-coverts in that description is somewhat peculiar, but the description is made from Hombron and Jacquinot's figure, in which the white is accidental or an addition of the artist. The adult *female* is quite sooty black all over. This was evidently known to Dr. Finsch, for (*P.Z.S.* 1880 p. 575) he says: "Young *females* change from the cinnamon into the black garb." This same author, however, was of opinion that the adult *male* changes into a sooty black plumage in August, while in July they are still in full white dress. He says, after describing the adult *male*: "In August the same birds are of a uniform dull sooty black." Such is not the case, but the black birds are the adult *females* only, while young birds are of a cinnamon colour, paler and almost white below. Examples changing from the cinnamon dress to both the white of the adult *male* and the black of the adult *female*, were obtained in December, but some also in November and January, and one in June.

The plumages of this bird may thus be briefly diagnosed:

White with black throat and forehead: ♂ ad.

Uniform sooty black: ♀ ad.

Cinnamon: ♂ and ♀ juv.

Mixed cinnamon and white: ♂ hab. trans.

Mixed cinnamon and black: ♀ hab. trans.

The birds in transitional plumages are remarkable in many ways. Although they are, of course, passing through a moult, there are *males* in evidently cleanly moulted plumage with a great amount of cinnamon to the feathers, especially their tips and outer webs. The question now arises, and cannot be settled by me at present, whether these individuals retain this cinnamon colour until the next moult, or whether it is lost before—in the latter case we would have to accept a change of colouration without moult. I may remark that the usual abrasion cannot produce this change, as there is too much cinnamon in the plumage. In



an evident young *female* (though not sexed) the tail consists of some abraded old cinnamon feathers, and of the fresh sprouting feathers some are black, others side by side with the black, cinnamon, and some mixed black and cinnamon. This same specimen has mixed feathers on many parts of its body and wings, while sprouting remiges are sooty black.

Some of the adult *males* have the black tips to the wings more extended, while in others they are nearly quite absent. Two adult *females* have single tail-feathers pure white or irregularly marked with white, and one has a quite white chin, while most examples have only three to six tiny chin-feathers white.

The adult *male* and *female* have the bill and feet slaty grey, the iris clove-brown. The young have the base of the lower bill yellowish. The local name is "Ouaf" or "Uaf," and from the natives having the same name for all the plumages it is evident that they are aware of their history.

The species is apparently only to be found on Ruk Island. Its song is strong and pleasant.

Two nests were found on June 1st and 4th, both twenty feet high, on breadfruit trees. A third was taken on June 12th on a "Chiya" tree. The nests are built of dry palms, of fibres and grass, with a few decomposed leaves and rootlets, and each contains one single egg only. According to Finsch (*Proc. Zool. Soc.*, 1880, p. 575) Kubary found either one or two eggs. The eggs are cream-coloured, speckled with brownish red, more frequently and often very thickly on the large end, and with some deeper lying pale purplish grey patches, and one has some very fine black lines on the large end.

The eggs measure : 25.6 : 18.4, 26.5 : 18.6, and 26.6 : 19.5 mm. The shape is that of shrikes' eggs.

A very good figure of the egg is given on pl. I., fig. 5, in Nehr Korn's "*Katalog der Eiersammlung*."

## 6. *Myiagra oceanica* Jacq. & Pach.

(Wiglesworth No. 101 p. 23.) (Nehr Korn, *Kat. Eiersamml.* p. 30, Egg !)

Very numerous on Ruk Island. The *female* differs from the adult *male* in having the crown not steel-blue, but dark grey, with a faint steel-blue gloss, and in being very little smaller—the wing perhaps two or three millimetres shorter. "The iris is seal-brown (Ridgway pl. III. 1); the upper bill blue-black, with a pale plumbeous streak near the cutting-edge; lower bill dark plumbeous; legs and toes blackish slate-colour." Native name on Ruk "Koi-Koi."

A good many nests were found from March to July, but chiefly in June. They contained all one egg only, but one had two, of which, however, one was broken by the finder. The nests are neatly and strongly woven, beautifully round and somewhat flat. The bottom is thick, but the walls thin. They are composed of fibres and rootlets, and outside are more or less ornamented, with pale greyish green lichens and cobwebs, some very beautifully. They are placed on breadfruit and other trees, about seven to twenty feet from the ground. The eggs are pale greenish or brownish white, not much pointed, generally marked with a wide belt round the middle, closely resembling many shrikes' eggs. The spotting is generally reddish brown, but sometimes of a paler brown, often spread all over the egg, and there is nearly always some lavender-grey or ashy grey colour in the form of underlying patches and spots. Some eggs are white with only a few small brown



spots. The eggs measure: 21:16, 21:15·8, 21:16, 21·5:15·6, 22·1:16·3, 21:16, 20:15, 20·5:15·6, 20:15, 21:15·5, 21:16, 21:16·1, 20:15·6, 20:15·1, 21·5:16·1, 20·5:16·1, 20·5:14·8, 20:16·2, 20·1:14·5, 20:15·5, 21:16 mm.

### 7. *Aplonis kittlitzi* Finsch & Hartl.

(Cf. Nov. Zool. V. p. 58.) (Wiglesworth No. 239 p. 44.)

Common. "Iris deep yellow; bill and feet black." The natives seem to believe that the striped, immature birds are belonging to a different species, as they call—according to our collectors—the uniform glossy black birds "Aga," the striped ones "Boei."

Numerous nests were found from May to July and one in March, all in holes of trees, in various heights from four to nearly twenty feet. The clutches consisted of one, two, and three eggs. The eggs vary much in size and shape, but are always similar to other spotted Starlings' eggs. Most of them are light blue, marked with rufous brown and lavender-grey or purplish grey. One is very pale, almost white, and is at the same time the smallest, measuring only 28·3:20·3 mm. The two largest eggs from Ruk measure: 31·5:22 and 33·5:22 mm.

### 8. *Erythrura trichroa* (Kittl.).

*Fringilla trichroa*, Kittlitz in *Mem. Acad. Petersb.* 1835. 8 pl. 10; Salvadori, *Orn. Papuas. e Moluc.*

II. p. 442 (1881) (*partim*!); Sharpe, *Cat. B. Brit. Mus.* XIII. p. 385 (*partim*!); Wiglesworth No. 220 p. 42 (Carolines only!).

*Erythrura glauca* (*spec. ex spirit!*), Finsch in *J. M. Godeffroy* 1876, XII. p. 35.

We have received a large series from Ruk Island. The local name is "Lugöpal." "Iris seal-brown (Ridgway III. 1); bill black; legs and toes wood-brown; claws paler brown." Specimens shot in November are mostly in moult.

The somewhat remarkable distribution attributed to *Erythrura trichroa*—viz., Carolines, Northern Moluccas, New Guinea, and Solomon Islands—led Mr. Rothschild and me to study this species more closely, and we found that it is separable into a number of geographical forms:

#### a. *Erythrura trichroa trichroa* (Kittl.).

Carolines: Kushai, Ponapé, and Ruk. We have not been able to examine skins from Kushai, but those from Ponapé and Ruk are perfectly alike, and the description and figure of the types from Kushai agree entirely with them.

These birds are of a dark green, the under wing-coverts are generally washed with greyish-brown, the wing does not exceed 60 mm. in length, being 56—60 mm. long.

#### b. *Erythrura trichroa modesta* Wall.

Wallace in *Proc. Zool. Soc. Lond.* 1862 p. 351.

Moluccas: Batjan, Ternate, Halmahera. Specimens from the three islands in the Tring Museum. Generally of a less deep and more yellowish green, especially on the underside. The under wing-coverts are clear buff, without the greyish wash so frequent in *E. trichroa trichroa*. The wing is always over 60 mm. long, reaching from 62—65 mm.

*c. Erythrura trichroa papuana* subsp. nov.

Differs chiefly in its larger size. The beak is much thicker than in the allied forms, the wing in one male from Arfak is fully 67 mm. long. The colour is of a deep green. The blue on the head in the one *male* before us occupies practically the entire crown of the head, while in forms *a* and *b* it does not reach beyond the hinder margin of the eyelids in the middle of the crown. Salvadori, *Orn. Papuas. c. Mol.* II. p. 442, has already mentioned the large size of an Arfak specimen, and the less intensely green colour of the Moluccan skins.

*d. Erythrura trichroa woodfordi* subsp. nov.

Solomon Islands: Aola, on Gnadalcanar. Sharpe (*Cat. B. Brit. Mus.* XIII. p. 386) has remarked that the blue frontal band is narrower, and that they are "otherwise identical with those from Ternate." They are indeed as yellowish green as Ternate ones, and the bill is not as thick as in those from Arfak. The wing of two *females* in the Tring Museum is 63—64 mm. long. This form is certainly not our form *c*, but very near to form *b*, from which it seems merely to differ in a narrower frontal band, and perhaps a somewhat longer wing.

*e. Erythrura trichroa cyanifrons* E. L. Layard.

*Ann. and Mag. Nat. Hist.* (5), I. p. 374 (1878); Wiglesworth No. 216 p. 42.

New Hebrides: Tanna, Erromango. Differs in its much smaller size from forms *a*, *b*, *c*, *d*. In colouration it is like *a*; wing 54—55 mm.

*Er. trichroa* was frequently found nesting on Ruk Island in March, May, and June. The nests are large and very loose structures with a big opening on the side, so that the eggs are easily seen in the nest. The nests are placed on banana-trees and bushes. The eggs are three to five in number, of a glossless white, and measure: 17:13, 17·6:13, 15·5:12, 16·3:12·2, 16:13·5, 16·8:12·3, 16·1:12·1, 16·1:13·5 mm., and so on. Nehrkorn, *Kat. Eiersammlung*, gives 17:13 mm.

9. *Urodynamis taitiensis* (Sparrm.) (Wiglesworth No. 47, p. 11).

Ruk, 1. 7. 1896. Local name: "Nikiyap." Only this one specimen was obtained.

10. *Ptilinopus ponapensis* Finsch. (Wiglesworth No. 261, p. 50).

Very common. Local name: "Ute-ute." "Colour of bill light apple-green; iris between cadmium yellow and chrome yellow (Ridgway Pl. VI. figures 6 and 8); feet light chrome-yellow; claws blackish slate." The sexes of the adult bird are perfectly alike, only the *female* has the wing generally 2 or 3 mm. shorter. In the first plumage of the young bird the feathers of the upper and underside, and especially those of the wing-coverts, are tipped with yellow; head and neck uniform dark green. In the next stage the plumage is like that of the adult bird, except that the crown is still green and the hind-neck more greenish.

I have not seen sufficient material from Ponapé to say with certainty that

birds from Ruk and Ponapé are entirely the same, but Finsch and other authorities inform us that they are the same.

Open nests on boughs of large trees were found in May and June. They contained two eggs, measuring 33 : 23, 33·5 : 23·5, 33 : 23, 33·3 : 22, 33 : 23·2 mm. They are all remarkably pointed on one end, the narrowed point being very short.

#### 11. *Carpophaga oceanica* (Less.).

(Wiglesworth No. 266 p. 52 ; *Globicera oceanica*, Salvadori, *Cat. B. Brit. Mus.* XXI. p. 176).

Common on Ruk. Local name : "Muranoniloy." "Colour of bill blackish slate-colour ; iris carmine ; feet light rose-red, claws black." This species differs widely from *C. pacifica* in its chestnut abdomen and thighs. One specimen (adult *male*) has a wide light chestnut bar to the tip of the tail, and most of the feathers of the upperside tipped or edged or overspread with chestnut, some others show the same peculiarity in a lesser degree. A young bird (*female*) has the crown and hind-neck much darker than the adult ones, and the abdomen washed and spotted with blackish brown.

#### 12. *Phlegoenas kubaryi* Finsch. (Wiglesworth No. 284 p. 55.)

While we received a great number of the *Ptilinopus*, only eight of this fine pigeon were sent. The *female* is a little smaller than the *male*. "Colour of bill blackish slate-colour ; iris seal-brown ; legs and toes dark pink ; claws mouse-grey." The local name is "Sleep."

I have no Ponapé specimens to compare, but specimens from Ruk and Ponapé are said to be alike.

*Phlegoenas kubaryi* differs at a glance from *P. xanthonura* (= *pampusan* = *virgo*, cf. Nov. Zool. V. p. 60) in having a slate-coloured hind-neck and posterior part of the crown, but, as young *P. xanthonura* also have a slaty brown hind-neck and posterior part of crown, the young of *P. xanthonura* is very near to a dull *kubaryi*, and the two forms might perhaps better be considered to be subspecies only.

#### 13. *Numenius phaeopus variegatus* (Scop.). (Wiglesworth No. 333 p. 66.)

One pair shot on May 5th. (*N. phaeopus* of Finsch in *Proc. Zool. Soc.* 1880 p. 576.)

#### 14. *Limosa lapponica novaezealandiae* (Gray). (Wiglesworth No. 332 p. 66).

One *male*, October 18th.

#### 15. *Totanus incanus* (Gm.) (Wiglesworth No. 329 p. 65).

Obtained in February and October. One adult *female* shot June 15th, 1895, with a wing fully 181 mm. in length.

#### 16. *Heteropygia acuminata* (Horsf.) (Wiglesworth No. 327 p. 64.)

Not rare in February and early in March. Local name : "Klyn."

17. *Charadrius fulvus* (Gm.) (Wiglesworth No. 322 p. 63).

Common on February 6th.

18. *Aegialitis mongolus* (Pall.).

One *female*, February 8th, 1896. Local name: "Klyn." Not mentioned by Wiglesworth and Finsch.

19. *Squatarola squatarola* (L.)

One *female*, Ruk, January 29th, 1896. Not mentioned by Wiglesworth and Finsch.

20. *Streptilas interpres* (L.) (Wiglesworth No. 320 p. 63.)

Common in February and March.

21. *Poliolimnas cinereus* (Vieill.) (Wiglesworth No. 312 p. 61.)

Five specimens sent from Ruk. The local name is "Iliilinebon." (Nov. Zool. V. p. 64).

Two nests were found on the swampy ground among the reeds, one containing four, the other three eggs. The eggs are pale buff, or cream-colour, speckled all over with brownish rufous, more frequently near the broad end. In some eggs these spots are larger, in others minute, and there are often some underlying pale purplish grey spots. If held against the light the eggs shine through very pale greenish yellow. They measure: 32 : 22.8, 31.1 : 23.1, 33 : 23.5, 30.3 : 22.4, 30.2 : 23.5, 31 : 23.3 mm.

22. *Micranous leucocapillus* (Gould).

(Wiglesworth No. 376 p. 77, sub nomine *Anous melanogenys*.)

Half a dozen specimens were shot in November. Local name, "Pohlicki."

23. *Anous stolidus pileatus* (Scop.) (*A. stolidus*, Wiglesworth No. 375, p. 76).

*Le petit Fouquet des Philippines*, Sonnerat, *Voyage à la Nouv. Guinée* p. 125, pl. 85 (1776).

*Sterna pileata*, Scopoli, *Del. Faun. et Flor. Insubr.* II. p. 92, no. 73, ex Sonnerat (1786).

*Sterna philippina*, Latham, *Ind. Orn.* II. p. 805, ex Sonnerat (1790).

*Anous rousseaui*, Hartl. *Beitr. Orn. Madagascar*, p. 86 (1861).

*Anous frater*, Coes in *Proc. Acad. Philad.* 1862 p. 558 (South Pacific).

*Anous stolidus rousseaui*, Ridgway in *Proc. U.S. Nat. Mus.* XIX. pp. 645, 646.

Messrs. Coes and Ridgway are perfectly correct in separating the Noddy of the Pacific from that of the Atlantic Ocean. The tail of *A. s. pileatus* is longer and more graduated than that of *A. s. stolidus*, the pileum more greyish and never so whitish, the general colouration more sooty and not so brown, the wing generally longer. There is, however, no doubt that *Sterna pileata* is the oldest term for this form, and that also *Sterna philippina* applies to it. **Both** these names are based on the "*Petit Fouquet des Philippines*" of Sonnerat, who distinctly describes (and figures rather badly) a white-crowned Noddy. The facts, that only *Anous stolidus* and not *Micranous leucocapillus* is known to frequent the Philippines, and that Sonnerat describes the size of his bird as twice that

of *Sterna anaetheto*, and that he calls the bill curved, forces us to accept his name for the Pacific form of the *Anous stolidus*.

For want of better knowledge I follow Ridgway in uniting the form from Madagascar and the southern Indian Ocean with the Pacific one, but I agree with Ridgway that a further subdivision may in future be necessary, and I think specially that it is likely that the Red Sea bird (*Anous plumbeigularis* of Sharpe) may be found to differ, if a large series is studied.

Our collectors found *Anous stolidus pileatus* frequent on Ruk Island. Local name, "Pohlicki." Nests, containing one egg each, were found from March to July 1st "on 'Tako' trees, or on the roots of Mangrove bushes." The "Tako" is described as a "tall tree resembling the cocoanut palm."

24. *Sterna bergii* Licht. (Wiglesworth No. 364 p. 74).

Ruk, December 5th, 1895, and May 7th, 1896. Local name "Nipawalne" or "Nipowalne."

25. *Sterna melanauchen* Temm. (Wiglesworth No. 367 p. 74).

One specimen (? ♀) was obtained on February 1896. It agrees fairly well with Saunders' description of the immature bird in *Cat. B. Brit. Mus.* XXV. p. 128, but the wing-coverts are nearly white, the four outer pairs of rectrices are marked with black on the outer webs.

26. *Gygis alba kittlitz* Hart. (*Gygis alba* Wiglesworth No. 381 p. 78).

Frequent and breeding on Ruk Island. Cf. Nov. Zool. V. p. 67. Local name: "Arakal" and "Alakal," also "Ekigab."

The single egg was found in June in the fork of branches and on the bare ground.

27. *Phaethon lepturus* Daud. (Wiglesworth No. 361 p. 73).

♂ ad. 14. 6. 1896. Local name: "Uhk."

28. *Puffinus obscurus obscurus* (Gm.) (Wiglesworth No. 388 p. 79).

Three *males* and one of doubtful sex were obtained on June 15th and 16th. Their local name is "Niffolo." "The colour of the bill is blackish: the iris seal-brown." The outer toe is blackish in skin, the inner and middle toe of a light colour.

See Nov. Zool. V. p. 194, where the subspecies of this species are discriminated.

A single egg, laid on a small heap of dry leaves, was found on June 16th in a hole about four feet deep on the side of a cliff. It is white, and measures 42:35.5 mm.

29. *Nycticorax caledonicus* (Gm.) (Wiglesworth No. 134 p. 68).

One *male* was shot on May 25th, 1896. Its local name is given as "Kao-Kao." It has a rather dark back and somewhat darker wings than other specimens of this species before me.



30. *Demiegretta sacra* (Gm.) (Wiglesworth No. 337 p. 67).

Rather common. Local name "Soppu" and "Kao-Kao." There are slate-coloured and white individuals, and many two-coloured ones. These do **not** change from a slate-coloured to a white or from a white to a slate-coloured dress, but have white and slaty feathers at the same time and get them again by moult.

31. *Ardetta sinensis* (Gm.) (Wiglesworth No. 339 p. 68).

Rather common on Ruk Island (Cf. Nov. Zool. V. p. 65). Local name "Liob."

The nests, containing one and two eggs, were found in May and June, among reeds. The eggs are of the palest green, almost white, and measure 33·6 : 26, 38 : 24·8, 38·5 : 34·3, 30·8 : 24·5, 31 : 24·2, 35·5 : 25·5, 35 : 24·5, 34·3 : 24·3 mm.

Finsch, in his list of Ruk birds in the *Proc. Zool. Soc. Lond.*, 1880, pp. 574-77, enumerates twenty-nine species, of which he had examined specimens of fifteen species, the others being inserted on the authority of Kubary. The following are not in my list.

32. *Collocalia vanicorensis* (= *fuciphaga* Cat. B. Brit. Mus. XVI., p. 500).

It is strange that our collectors did not come across this bird.

33. *Phaëthon rubricauda* (Bodd.)34. *Tachypetes aquila* (= *Fregata aquila*).35. *Dysporus sula* (= *Sula sula*).

Thus we know thirty-five species of birds to occur on Ruk. We may with certainty suppose that no more land-birds are to be discovered, but that sea-birds will occasionally visit the islands, which were not hitherto observed. The only fact of first-rate interest yet to be discovered, is the breeding and the eggs of *Tephras ruki*, which were not found this time. Poor as the ornithology of Ruk is, the land-birds are of great interest. The beautiful *Metabolus rugensis*, *Myiagra oceanica*, and *Tephras ruki*, are, as far as we know at present, only found on Ruk Island.

The absence of all *Alcedinidae*, of which species are found on all the neighbouring groups of islands, the Pelew and Marianne Islands, and on the other Carolines, of hawks, owls and of *Rhipiduræ* on Ruk is remarkable.

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## THE BIRDS OF DAMMER ISLAND IN THE BANDA SEA.

BY ERNST HARTERT.

DAMMER, Dammar or Damma, is a volcanic island in the Banda Sea, north of the line of the so-called "Serwatty Islands," which extend in an east-north-eastern direction from Timor. It is about half-way between Timor and Timorlaut. It is less than ten miles in length and about five miles wide. The island is one of the prettiest in the Eastern Archipelago, and almost entirely covered with dense forest and vegetation; only the top of the volcanic peak in the north, which is often emitting a stream of white smoke, and which rises to about 4000 feet, is bare of forest growth. The forest is so dense, that it is very difficult to penetrate it for any distance. Many boiling hot springs and streamlets are found, which are utilized by the natives for cooking. The island is scantily inhabited by two races of Papuan and Malay type, who live in separate villages. They are all friendly and well disposed towards foreigners. They keep some pigs and fowls, and are most expert fishermen. Sago and cocoa-nut palms, enormous mango trees, jack-fruit (*Artocarpus*) and bread-fruit are found in abundance, as well as bananas and tobacco. Birds, lepidoptera and coleoptera are numerous. Messrs. J. Walker and Bassett-Smith, who visited Dammer on H.M. surveying ship *Penguin* in 1891, brought home one species of mammals (a form of *Cuscus maculatus*), ten species\* of birds, namely *Rhipidura elegantula*, *Rhipidura bättikoferi*, *Graucalus melanops*, *Zosterops bassetti*, *Stigmatops squamata*, *Hirundo gutturalis*, *Psitteuteles euteles*, *Ptilinopus xanthogaster*, *Carpophaga rosacea* and *concinna*, five species of reptiles, namely, *Gecko verticillatus*, *Calotes cristatellus*, *Lygosoma striolatum* and *fuscum*, *Ablepharus boutonii fuscata*, ten mollusca, one hundred species of coleoptera, thirty of other insects and one freshwater crustacean. Besides this interesting, but fragmentary collection from Dammer, I am only aware that A. B. Meyer enumerates three species of birds:—

*Urospizias torquatus* = *Astur polionotus* (No. 27).

*Pitta brachyura* = *Pitta rigorsi* (No. 20) and *Carpophaga concinna*, which were sent to him by Mr. Riedel.†

The entire ornithological literature relating to Dammer Island is therefore:—

1884, A. B. Meyer, in *Abh. "Isis,"* Dresden, p. 7 (three species).

1894, R. B. Sharpe, in *Ann. & Mag. Nat. Hist.*, ser. 6, v. XIV. pp. 56-58 (ten species).

In connection with this last-named article a very interesting account of a visit to Dammer Island is given by Mr. J. Walker, from which most of the foregoing notes are taken.

In 1899 our esteemed correspondent Heinrich Kühn, to whom we owe already several other valuable collections from the Eastern Archipelago, made a trip to Dammer and sent us a large collection of birds and lepidoptera. Here follows the list of the birds collected by him. They are mostly collected at a place called Woeloer, some at Bebber and Ili.

\* Mr. Walker says his party collected only nine, but Sharpe enumerates ten.

† Care must be taken not to mistake Dammer Island in the Banda Sea for the island south of Halmahera which is variously spelt Dama, Damme, Dammar or Dammer. It is this latter island where Bernstein collected a few birds (cf. *Stigmatops chloris*, *Myzomela simplex* and others), not the Dammer visited by Kühn.

1. *Geocichla peronii audacis* Hart.

(*Bull. B. O. Club* v. VIII. No. LXII., p. 43, April 1899).

This fine Thrush differs from *G. peronii* of Timor in having the upperside more uniform and of a much deeper chestnut-rufous colour. The chest and sides of the body are much darker and more chestnut-rufous. The wing is shorter.

"Iris brown, feet pale flesh-colour, bill pale greyish-brown, paler below."

Wing 10—104 mm. (at least 110 in *G. peronii peronii*), tail about 75, tarsus 32—33, bill 19 mm.

This bird is named in honour of Mr. Kühn (*kühn* in German = *audax* in Latin).

2. *Rhipidura elegantula* Sharpe.

Sharpe in *Notes Leyden Mus.* 1879 p. 23; Büttikofer in *Notes Leyden Mus.* 1893 (v. XV.) p. 76; Sharpe in *Ann. Mag. Nat. Hist.* 1894, ser. 6, v. 14, p. 56.

Five specimens from Dammer seem to agree in every respect with *Rh. elegantula*, described from a single specimen from Lettie. The comparison of a series from Lettie would be desirable.

"Iris very dark brown; feet plumbeous black; bill black."

3. *Rhipidura setosa büttikoferi* Sharpe.

Sharpe in *Bull. B.O. Club* v. 1, No. 4, p. 18 (1892); *Ann. & Mag. Nat. Hist.* 1894, ser. 6, v. 14, p. 56.

This interesting form belongs doubtless to the group of *Rh. setosa*. From typical *setosa* it differs in being much deeper brown above, in having sharply marked white spots on the chest, and in having much more white on the outer rectrices. The chest is marked with longitudinal narrow white shaft-stripes. In this respect it resembles *Rh. setosa isura*, but the spots are narrower and sharper, the chest and upper surface darker. *Rh. hoedti* from Lettie is evidently very closely allied, but more greyish above. We know thus (cf. *Nov. Zool.* V. p. 525) :

*Rh. setosa setosa*, New Ireland and New Britain.

*Rh. setosa gularis*, New Guinea.

*Rh. setosa nigromentalis*, Louisiade Islands.

*Rh. setosa hoedti*, Lettie.

*Rh. setosa büttikoferi*, Dammer.

*Rh. setosa isura*, Australia.

*Rh. setosa assimilis*, Key Islands. More to come!

"The iris of *Rh. s. büttikoferi* is deep brown, bill and feet blackish."

This form is common on Dammer Island.

4. *Myiagra rufigula* Wall.

Woeloe, Bebbier and Ili on Dammer. Only a few specimens received.

5. *Monarcha trivirgata* (Temm.).

A good series from Woeloe.

### 6. *Monarcha inornatus kisserensis* A. B. Meyer.

All the specimens from Woeloe agree with Dr. Meyer's from Kisser (*Sitzber. d. Abb. "Iris,"* Dresden, 1884, p. 22) in being very light whitish grey. The study of a sufficiently large material will probably enable us to separate several more local forms. Specimens from the Sula Islands are almost equally pale as those from Dammer, while *M. inornatus commutatus* from Sangi is a darker form.

### 7. *Heteranax mundus* (Scl.).

(For synonymy see Salvadori, *Orn. Papuas. e Molucc. Aggiunte* II., p. 75.)

We have received a good series from Dammer, and we cannot find any differences from specimens of Timorlant. Only the adult male seems to be described. The adult female does not differ from the adult male, except that it is a trifle smaller, the wings of the males measuring 80 to 85 mm., those of the females 77 to 78 mm. The young, in both sexes, differs considerably. It is above earthy brown, forehead whitish, caused by the white bases to the feathers. Remiges deep brown, margined outwardly with rufous brown, inwardly with whitish. Rectrices blackish brown, margined with brown, the three outer pairs with wide buff tips, largest on the outermost pair. Lores, sides of head and neck, and throat white, breast and abdomen cinnamon-buff, thighs grey. Under wing-coverts whitish buff. Adult: "Iris dark brown. Feet slaty-grey. Bill bright ash-grey with blackish tip and whitish cutting-edges."

### 8. *Dammeria henrici* Hart.

In *Bull. B. O. Club*, v. VIII., pp. LVII., LVIII., I described this interesting flycatcher about as follows:—

#### *Dammeria* gen. nov. Muscicapidarum.

Remarkable for its strong, high, and arched beak, with large nostrils plainly to be seen in front of the stiff, short, frontal plumes, which are continued on the beak to the nostril. In the well-developed wing the fifth primary is the longest, the first a little more than half the length of the second. Tail composed of twelve feathers, rather more than two-thirds of the length of the wing; rectrices about equal in length, slightly pointed. Metatarsus long, longer than the middle toe with claw, covered in front with a lamina, which shows some two or three divisions near the toes. Sexes dissimilar in colouration.

*Dammeria henrici*, ♂ ad. Above dark slaty blue, lores and feathers of the forehead darker, nearly black. Above the lores, from eye to middle of forehead, a line of pure white feathers, similar to that found in many species of *Brachypteryx*. Underside dark slaty blue, chin darker, almost black; in the middle of the throat a white, sometimes concealed patch. Feathers of chest and breast with narrower or wider longitudinal white spots near the tips, those of the belly and sides of the rump tipped with white, under tail-coverts nearly black, with white patches. Remiges slaty black, brownish grey towards the bases of the inner webs; under wing-coverts slate-colour, partly tipped with white. "Iris brown, bill black, feet blackish plumbeous." Total length about 130 mm., wing 68—69, tail 50, metatarsus 20, culmen about 15, bill from end of nostril to tip 7 mm.

♀ ad. Above olive-brown with a slaty wash, upper tail-coverts slaty-brown:



a buff superciliary line from the forehead to above the eye. Remiges olive-brown, outer webs edged with rusty brown, pale brown towards the base of the inner webs. Ear-coverts with pale shaft-lines. Under surface rusty buff, brighter on the throat and chest, and washed with olive on the sides and flanks; feathers of the chest with olive patches, producing a somewhat striped appearance. Feet pale flesh-colour. Wing 64—65 mm.

♂ immat. Resembles the adult female, but with the upper surface darker and the feathers with ferruginous tips, chest more streaked, superciliary stripe less developed.

Mr. Heinrich Kühn sent nine specimens of this most interesting bird. The bird is named in commemoration of Mr. Kühn's Christian name, Heinrich = Henriens.

### 9. *Gerygone kühni* sp. nov.

♂ ad. Above rufous-brown, the head paler and more ashy brown. Sides of head pale ashy brown, lores with a whitish spot. Remiges dark sepia-brown, outwardly margined with olive-rufous-brown, the inner secondaries with the colour of the back, inwardly with whitish grey. Rectrices deep sepia, with a wide blackish bar and an ill-defined whitish anteapical patch on the margin of the inner webs. Chin, throat, chest, middle of breast and abdomen white, sides of breast and flanks rufous brown, almost chestnut, a little brighter than the back, and having very little white in the middle of the abdomen. Under wing- and under tail-coverts white with a rusty wash. "Iris burnt-sienna-red, feet plumbeous, bill black." Wing 55—57, tail about 43, tarsus 21, bill 11 mm.

♀ ad. Like the adult male, only a little smaller; wing 53 mm. Juv. underside sulphur-yellow instead of white.

Named in honour of its discoverer.

This form is apparently nearest to *G. keyensis* Büttik; described from a young bird in the Leyden Museum (*Notes Leyden Mus.* v. XV. 1893, p. 258), but it is much more rufous above and on the flanks, also smaller. It differs from *G. inornata* and *G. everetti* in the markings of the tail, and the colour of the upperside. It seems to agree very nearly with *G. hisserensis* Finsch (*Notes Leyden Mus.* v. XX., p. 133, 1898) in the markings of the tail, but it is not at all olive-brown, but rufous-brown on the upperside.

No doubt several of these forms will in future be treated merely as subspecies, but at present a satisfactory review cannot be given from the material in the Tring Museum.

### 10. *Edoliosoma dispar* Salvad.

A fine series from Dammer. Comparing them with a series from Key and Banda, I found no constant differences. The size is rather variable. ♂ ad.: "Iris dark brown, feet and bill black." ♀ ad.: "Iris dark brown, bill brownish black, feet slaty grey."

### 11. *Dicaeum salvadorii* A. B. Meyer.

One single male from Woeloe, Dammer, agrees fully with Dr. Meyer's description of *D. salvadorii* from a single male from Bebbier. It differs from *D. mackloti* in having a larger and wider bill, the red of the throat being more extended towards



the breast and a shade less bright, and the abdomen not pure white but buffy. "Its iris is dark brown, bill and feet black."

Comparison of a good series both from Bebbier and Dammer would be of interest.

#### 12. *Anthus gustavi* Swinh.

♂, Woeloei, 9. 12. 1898. "Iris dark brown, feet pale flesh-colour."

#### 13. *Motacilla boarula melanope* Pall.

Common in November and December.

#### 14. *Zosterops basseti* Sharpe.

In *Ann. & Mag. Nat. Hist.* 1894, ser. 6, vol. 14, p. 57, Dr. Sharpe described this form as follows:—"Similis *Z. albiventris*, sed paullo major, loris et gatture aurantiacis nec sulphureis, et corporis lateribus cinerascanti-brunneis nec isabellinis distinguenda. Long. tot. 5.0 poll., culm. 0.6, alae 2.45, caudae 1.75, tarsi 0.75." There is no doubt that this diagnosis refers to this *Zosterops*, of which I have before me eight skins sent by Mr. Kühn from Dammer, even if I had not compared the type; but I do not consider the comparison with *Z. albiventris* from the Torres Straits a very lucky one. In my opinion the nearest ally is *Z. citrinella* from the Timor group, from which *Z. basseti* differs in having a larger beak, in being less yellowish and more olive above, in being much more brownish on the sides of the breast and flanks, and in having a longer wing. From *Z. grayi* of Key it differs in being much less bright yellowish, especially on the wings and upper tail-coverts, and in being brownish, not ashy grey on the sides.

Mr. Kühn describes the iris as "brown, feet ash-grey, bill dull greyish brown." The sexes do not differ, except that the female is perhaps a trifle smaller. There is no doubt that *Z. citrinella*, *basseti*, *grayi*, and others will ultimately be classified as subspecies of one form, but without an elaborate study of the whole group this is not to be done, and I should at present even hesitate to say how the species should be named. Therefore I leave this to a future time.

*Zosterops lettiensis* Finsch in *Notes Leyden Mus.* v. XX. p. 136 (1898) seems fully to agree with *Z. basseti*, except that it is slightly smaller. The comparison of a series from Lettie is desirable.

#### 15. *Stigmatops squamata* Salvad.

A good series from Dammer. "Iris yellowish grey, sometimes more brownish, bill black, feet dark grey."

Dr. Sharpe (*Ann. Mag. Nat. Hist.* 1894, ser. 6, v. 14, p. 57) identifies the bird from Dammer with *St. kebirensis* A. B. Meyer, but it is *squamata*. Mr. Rothschild and I have carefully compared eight adult Dammer skins with ten adult specimens from Koor (or Koer), also collected by Herr Kühn, and we found them quite alike. Sharpe's Dammer bird is immature, and that is the reason for the less extended scaling on the under surface. We have no specimens from Bebbier (or Kebir), but—unless all those examined from the latter island are immature—they seem to differ in several points, and to be similar to young *squamata*. Sharpe (*l.c.*) says that

he fails to see the characters for separating *St. salvadorii* from Timorlaut from *St. squamata*, but *St. salvadorii* is apparently a distinct form, being very much smaller, the wings about 1 cm. shorter. We have four Timorlaut birds for comparison.

The female of *St. squamata* is a little smaller than the male; the young bird has the area behind and below the eye, which in the adult birds is covered with short scaly deep black feathers with silvery white tips, quite bare and of a light flesh-colour, and the breast is pale greenish grey without scales. Sharpe (*l.c.* p. 57) questions the correctness of the occurrence of *St. chloris* on Dammer, mentioned by Salvadori (*Orn. Pap.* II. p. 326), but it is Dammer in the Moluccas, not our Dammer, where Bernstein collected this and other birds.

The nest of *St. squamata* is a neat structure, ornamented on the outside with white little cobwebs and wool and cotton, with a "tail" hanging down from the bottom, and an entrance hole on the side, which is sometimes overhung by a protecting leaf and with a little porch-like roof. The eggs (two in number) are white, finely speckled and punctated with a light-brownish red or bright brick-red. They measure : 17.5 : 13.2, 17.7 : 14, 18.5 : 12.9, and 18.6 : 12.5 mm.

#### 16. *Pachycephala melanura dammeriana* subsp. nov.

I have no doubt, that *P. melanura, clio, buruensis, macrorhyncha, obiensis, everetti* and several others will be treated as subspecies of one form, and I therefore do not hesitate to call the new form also merely a subspecies of *melanura*. In the distribution of colours it agrees with the other forms. Chin and throat pure white, surrounded by a 5 to 10 mm. wide black collar. The yellow collar above well defined. The wing-coverts are olive-green with small black bases. Primary-coverts and bastard-wing black with olive-grey borders. Outer webs of remiges edged with greenish olive-grey. Rectrices black, outwardly edged with yellowish olive-green, broader towards base, very narrow near tip. All the rectrices tipped with olive for about 4 mm. The back is olive-green, less yellowish than in *P. m. clio*, breast and abdomen yellow, less bright and golden than in *clio*. This latter form is perhaps the most similar one to *dammeriana*, differing, however, in the much more extended black bases to the upper wing-coverts, uniform black primary-coverts, more golden upperside, deeper yellow underside, and an almost pure black tail with almost imperceptibly narrow olive tips. The female of *P. m. dammeriana*, of which, however, only one is received, seems not to differ from that of *clio*. The size is about that of *clio*.

#### 17. *Pachycephala arcitorquis* Sel.

A series from Dammer agrees with Timorlaut specimens in the British and Tring Museums.

#### 18. *Calornis circumscripta* A. B. Meyer.

*Calornis gularis* (errore, non Gray), *Cat. B. Brit. Mus.* XIII. p. 141 ; *C. circumscripta*, A. B. Meyer in *Sitzungsber. u. Abh. Ges. Isis* 1884, 1 p. 49 (Timorlaut) ; *C. circumscripta*, Salvadori, *Agg. II. Orn. Pap. e. Mol.* p. 141.

A series from Dammer (Woeloe) agrees so well with typical *circumscripta* from Timorlaut, that I cannot separate them. In some, but not in all, the bill is less high. The iris of *C. circumscripta* is vermilion, feet and bill black.

The name of *gularis* cannot be used for this species, because the bird from Morty is not distinguishable from *C. metallica*.

19. *Erythrura tricolor forbesi* Sharpe.

I have compared a series from Dammer with the single type of *E. forbesi* in the British Museum, and did not notice any differences. The comparison of a series would, of course, be desirable. *E. tricolor* of Timor is, of course, closely allied, differing merely in the blue colour of the crown being spread over the mantle.

" Iris dark brown, feet pale flesh-colour, bill black."

The eggs are white, rather pointed on the narrow end, and measure 17.5 : 13, 17.9 : 13.2 and 17.8 : 13 mm.

20. *Pitta vigorsii* Gould.

A series from Dammer agrees in every respect with a series from Banda. " The iris is brown, feet flesh-colour, bill black."

This beautiful *Pitta* inhabits Banda, Dammer and Timorlaut, while on Flores it is represented by the black-throated *concinna* Gould, with a bi-coloured superciliary stripe, on Alor and Lomblen by the perfectly similar *ecoretti* Hart., with a longer beak, on Timor by *irena* Temm., with a uniform superciliary stripe, on Sula Mangoli by the perfectly similar *crassirostris* Wall., with a larger bill, on Djampea by *virginalis* Hart., with a much broader stripe, on Sumba by *maria* Hart., without black on the abdomen and with a narrow uniform superciliary line, in North Queensland by the larger *simillima* Gould, with nearly the whole crown brown, in other parts of Australia by the still larger *streptopus* Temm. There can be no doubt that all these forms, representing each other on the various islands and agreeing in the pattern and general colouration as well as in structure, are all best treated as subspecies of one species, only the last two are more specialized and might be kept specifically distinct from the rest. Also *Pitta bertae* Salvad., which represents this type in Borneo, is allied to this group, while *moluccensis* P. L. S. Müll. stands much more apart, and occurs together with *P. bertae* on Borneo and on other islands of the Archipelago.

21. *Collocalia neglecta* Gray.

Five specimens from Woeloer. " Iris of the darkest brown, feet and bill black."

This swiftlet differs from *C. esculenta* only in being smaller, duller and less glossy above, and by some of the feathers of the rump and some of the upper tail-coverts having narrow whitish edges. The expression used in the *Catalogue of Birds* (v. 16, p. 510), " back, rump, and wing-coverts dark plumbeous grey," is far too strong, but I had then only four old skins, which were indeed very pale, and might very well be called "dark plumbeous."

22. *Eurystomus orientalis australis* Swains.

Not rare on Dammer.

Young individuals have a brownish black bill and no blue on the throat.

23. *Eos reticulata* (S. Müll.).

Two adult *males*, Bebbier, Dammer, 30. 12. 1898. "Iris with an outer burnt-sienna ring, followed by a sepia-coloured and an inner narrow yellowish grey ring. Feet black. Bill blood-red."

This species is only known from Timorlaut or Tenimber, but Mr. Kühn has also sent us one shot on Little Key Island.

24. *Psittuteutes euteles* (Temm.) (? subsp.).

We have a good series of this bird from Dammer. Only one of them approaches typical *euteles* from Timor, while most of them have the head much more greenish, the abdomen shaded with green. As, however, immature *euteles* from Timor are similar, I must leave it to future research whether such yellow-headed individuals as on Timor are ever found on Dammer. If the characters stated above—which are those of immature birds on Timor—serve to distinguish the Dammer form subspecifically, then the Wetter-bird (judging from one example received in exchange from the Leyden Museum) might belong to it, and those from Alor and Pantar would seem to be intermediate. "The iris in the Dammer birds is orange, feet olive-grey, bill yellowish vermilion."

I have no doubt that *Trichoglossus aloreensis*, described as a new species from Alor by Finsch (*Notes Leyden Museum*, XX., p. 226), is the young of *euteles*. The differences given are the characteristics of the immature birds. The only peculiarity of them is the dark brown bill. As our immature individuals have a brown tip to the bill, I must believe that the very young birds have totally brown bills. It is most unlikely that two so closely allied species of *Psittuteutes* inhabit the small island of Alor.

25. *Halcyon australasiae dammeriana* subsp. nov.

The specimens from Dammer, from where I have nine skins before me, differ from those from Timor, Lombok and Sumba, collected by Everett and Doherty, in having the crown of the head dark cinnamon with a dusky green patch in the middle, and some dusky green stripes on the forehead, while the entire crown is green in *H. a. australasiae*, only striped with cinnamon on the forehead. One of the specimens from Dammer closely approaches the typical form, but there is still more cinnamon on the anterior part of the crown. The specimens with the greatest amount of cinnamon are *females*. In typical *australasiae* I find no difference in the sexes with regard to the extent of cinnamon on the crown. The young bird has cinnamon edges to the upper wing-coverts, blackish ones to the feathers of the underside.

The iris of *H. a. dammeriana* is dark brown; bill black, lower bill whitish with dusky tip; feet pale brownish black.

Another subspecies of *H. australasiae*, the *minor* of A. B. Meyer, inhabits Timorlaut.

26. *Halcyon chloris* (Bodd.) (? subsp.).

In the series from Dammer all the *males* are remarkably blue, the *females* more greenish. The ear-coverts are black with a bluish wash. I do not believe that they can ultimately be classed with typical *chloris*, but at present the time and



material at my disposal are too limited to solve the question. I cannot think that Sharpe is right in separating *H. lunii* as a species, nor am I able to recognize all his races, but I do not either believe that all the forms can finally be united as one race. One of the Dammer birds has the bill curiously flat and upturned, very much like a *Todirhamphus*, and much like Sharpe's *meiyeri* from Togian, which, however, is also an individual aberration.

## 27. *Astur polionotus* Salvad.

Three *females* of a hawk from Dammer seem to be Salvadori's *A. polionotus*, described from Timorlaut. These birds are above of a considerably darker grey than *A. albicentris* from the Key Islands, and the rufous collar is more developed than in most *A. albicentris*. All the *females* (*males* are not in the collection) have very distinct cross-bars on the breast and abdomen, while the chest is uniform rufous. This rufous colour is darker than in most *albicentris*. The throat is very pale, whitish rufous, under wing-coverts white with narrow rosy-rufous cross-bars, thighs of a pale rufous, with or without faint cross-bars. "The iris is ochreous, feet ochreous, bill black."

Wing (♀) 240—245 mm.

A series from Great Banda seems to belong to the same form, but the thighs are quite white (as they seem to be in the type of *A. polionotus*); only one *female* has a faint red tinge and the faintest indication of cross-bars on the thighs. The *male* from Banda has a broad and distinct rufous collar, and the underside is uniform, only on the abdomen are faint indications of bars.

## 28. *Baza subcristata reinwardti* (Müll. & Schleg.)

Four skins of *Baza* from Dammer differ enormously from each other in the colouration of the underside, two having dark rufous, one ashy brown, one (a young example) narrow rufous brown zigzag bars.

I almost doubt the possibility of separating *Baza subcristata* and *reinwardti* even subspecifically! The only difference is in fact, as already shown by Salvadori, in his great "Ornithologia Papnasia," the smaller size of *B. reinwardti*, the differences in colouration, which Sharpe (*Cat. B. v. I.*) and others thought to be of specific value, being individual variations. While recognizing the generally smaller size of *reinwardti*, I find individuals (Djampea, Fergusson), which differ not from some Australian skins in size. If, however, *reinwardti* can be separated subspecifically (a specific separation is impossible), then *B. subcristata subcristata* should be restricted to Australia, the birds from the Moluccas, Lesser Sunda Islands and New Guinea being *all reinwardti*.

*Baza subcristata rufa* from Batjan, Halmahera and Obi Major is a mere rufous closely allied form.

*B. subcristata gurneyi* from the Solomons seems to be fairly distinct, but

*B. subcristata bismarchi* from New Britain and New Hanover does not seem to differ from *gurneyi*, except in having a longer bill.

*B. subcristata timorlaensis* from Timorlaut is somewhat doubtful, being based on a young bird, the adult of which is not yet known.

## 29. *Cuculus canorus intermedius* Vahl.

♀, Kuwray, Dammer Island, November 11th, 1898.

30. *Chrysococcyx rufomerus* sp. nov.

The adult male differs from *Chrysococcyx malayanus* as follows :—

The crown of the head is not brownish or purplish brown, but deep metallic green with steel-blue and bronze reflections ; the back is darker ; the entire underside is widely barred with deep greenish bronze, these bars being of a much deeper colour than in *C. malayanus* ; **the tail has no rufous colour whatever** ; some of the greater upper wing-coverts have some edges and bars of white. The wings have very pale or no rufous colouration to the inner webs. "Iris dark vermilion, feet and bill blackish." The adult female seems to have a well-marked uniform white patch in the middle of the abdomen. The iris of the female is described on the label as "ochreous grey." Wing 95—99 mm.

The young of both sexes is above pale greyish bronze, below greyish brown, with more or less dark brownish bars on the flanks: the iris is "reddish grey." This new form is perfectly distinct from *C. malayanus*, and all the other species of the genus known to me. It is probable that this and several others should only be treated as subspecies, but as yet their history and distribution are too little known to advance theories about their relationship. Future investigations will show, whether *C. rufomerus* is only found on Dammer Island, or also on other islands.

31. *Ptilinopus xanthogaster* (Wagl.).

Not rare in different parts of the island, at Batoe Merah and Wulur. "Iris orange, feet greenish grey, bill sulphureous."

All the specimens from Dammer have the neck more or less washed with green, the green of the upperside somewhat yellowish, the foreneck rather greenish. In this they agree with specimens from Banda. Some specimens from the Key Islands are perfectly similar to those from Dammer, while the perfectly adult Key birds have the neck beautifully greyish-white, the breast and abdomen very bright, the back pure green. As, however, our Key series is selected from a larger collection, and shot at different times of the year, while our six or eight birds from Banda and Dammer were all shot at the same time of the year, and as we know that the greenish neck is a sign of immaturity, I am not able to say that the Key birds are really different, and I am inclined to think that equally adult birds from all the islands are perfectly alike. Meyer has separated the Timorlant race as *P. flavocirescens*, but Salvadori seems to think that his characters are based on immature individuals. We have, at present, not sufficient material to decide this question.

32. *Ptilinopus lettiensis* Schleg.

A fine series from Dammer agrees with an adult male from Bebber (April 1898), received in exchange from the Leyden Museum. The yellow on the neck is, however, deeper in the Bebber specimen than in the eight from Dammer, but the depth of the yellow colour on the neck is not constantly alike in those from Dammer, which were all shot in November. Until, therefore, a large series from Lettie and Bebber are compared, the Dammer bird must stand as *P. lettiensis*. The iris of the Dammer birds is "burnt-sienna red, the bill yellow, slaty-green at base, feet bluish carmine."



33. *Carpophaga rosacea* (Temm.)

October and November. "Iris carmine. Bill dark grey with carmine nostrils. Feet bright carmine."

34. *Carpophaga concinna* Wall.

One male and two females were shot in November. Their iris was orange. They are typical *concinna*, and not a bit like *C. concinna separata* from the Key Islands.

35. *Columba metallica* Temm.

Found frequently in November and December. The specimens fully agree with those from Timor. The breast, neck, and mantle vary somewhat, the metallic gloss being sometimes beautifully purplish red, sometimes almost pure green. A young bird has the head and neck dull brown, the breast rufous brown. Adult birds have the "iris" orange, feet carmine, bill bright carmine, tip yellowish white. "The young birds have the "iris pale brown, feet brown, bill brownish black."

36. *Chalcophaps chrysochlora* (Wagl.)

Both sexes and young were shot in December.

37. *Rallina tricolor* Gray.

One female, Woeloe, 1. 12. 1898. "Iris brownish red, feet brown : bill light green. Eyelid ochreous."

This specimen is rather small, measuring only as follows : wing 138, tarsus 43, bill 22 mm. Being somewhat out of its generally known area of distribution, it is quite possible that it belongs to a smaller subspecies, but it is not possible to decide about this from a single specimen.

38. *Amaurornis phoenicura* (Forst.) (? *leucomelaena*).

One (apparently adult) specimen. In this the sides of the head and neck are perfectly slaty-black, and there is no white on the forehead ! This bird—a similar one is before me from Sumba—differs very much from young *A. phoenicura* from India. I am therefore inclined to think that there is after all a Timorese species or subspecies, to be called *leucomelaena*. (Cf. Sharpe, *Cat. B. Brit. Mus.* v. XXIII. p. 159, Mey. & Wigl., *Birds of Celebes* v. II. p. 708, Hart., *Nov. Zool.* V. p. 475, no. 74.)

39. *Charadrius fulvus* Gm.

♀ Ili, 16. 11. 1898.

40. *Numenius phaeopus variegatus* (Scop.)

♀ Woeloe, 9. 12. 1898.

41. *Limosa lapponica novaezealandiae* Gray.

Woeloer, 9. 12. 1898.

42. *Heteractitis brevipes* (Vieill.)

Woeloer, November and December.

43. *Tringoides hypoleucus* (L.)

Not rare in December.

44. *Glottis nebularius* (Gunn.)

♀ Woeloer, Dammer, 9. 12. 1898.

45. *Tringa crassirostris* Temm.

♂ juv. Kumur, Dammer, 14. 11. 1898.

46. *Bubulcus coromandus* (Bodd.)

♂, Woeloer, 12. 11. 1898.

47. *Demigretta sacra* (Gm.)

♂, Woeloer, 9. 12. 1898. Pure white, with a few small slaty-black spots on the neck and wing-coverts.

48. *Sula sula* (L.)

One adult bird, sex doubtful, Woeloer, Dammer, 5. 11. 1898.

49. *Megapodius duperreyi* Less. et Garn.

Common on Dammer Island. "Iris burnt-sienna red, feet yellowish vermilion, bill dirty yellow."

Thus Mr. Kühn sent forty-nine species, of which ten were previously known to occur on Dammer, although three were not quite correctly identified before. Two birds mentioned by Dr. Sharpe were not procured by Kühn: "*Graucalus melanops*" and "*Hirundo gutturalis*." Of these the *Hirundo* is only a winter visitor, and might not be of regular and frequent occurrence, but it is strange that the very conspicuous and large *Graucalus* was not obtained. As Dammer is quite within its range, I have no right to doubt its occurrence there, but it should be noticed that Sharpe names ten species of birds from Dammer, while Walker says nine only were collected.

It is remarkable that Dr. Sharpe from the scanty material before him drew correct conclusions about the zoogeographical relations of Dammer, which he said were with Timorlaut on the one hand, and with Timor on the other, "while some species may be found peculiar to the Damma, Lettie, and Wetter groups of islands." From our larger material it is evident that the relations with Timorlaut are very obvious (cf. *Heteranax mundus*, *Pachycephala arctitorquis*, *Eos reticulata*).

Some forms are exactly the same as those found on the so-called Serwatty Islands (Lettie, Moa, Bebbler, etc.), and those that are hitherto only known as Timor

species will probably all be found to occur on the Serwatty group as well, which is by no means sufficiently explored. It is remarkable that some forms are common to Timorlant, Banda and Dammer, and apparently not to be found elsewhere (cf. *Pitta vigorsi*, *Astur polionotus*).

The butterflies of Dammer seem to show a close relationship to those of Timorlant.

The number of birds at present only known from Dammer is small, and we do not doubt that many of them may ultimately be found on the Serwatty group of islands. One might therefore suppose that Dammer is not a very ancient island; and Mr. Doherty, who visited me when I had just written this note, tells me that, on a hurried visit to Dammer some years ago, he had the impression that Dammer was such a recent volcanic island, that it would not be worth while for him to sacrifice time and money for a long stay to collect lepidoptera. Until the Serwatty Islands are thoroughly explored, all these theories, however, are mere suppositions.

## DESCRIPTION OF THE HITHERTO UNKNOWN FEMALE OF *OENETUS MIRABILIS* ROTHSC.

By HON. WALTER ROTHSCCHILD, Ph.D.

♀ *Wings, upperside*: Ground colour of forewing gamboge yellow, completely covered with a network of dull apple-green; the meshes of the network are hexagonal in shape, and at each point of the hexagon is a thickened spot, and in the centre of each mesh is an irregular spot or dash of the same green colour. On the costal area are a number of chocolate brown patches, first a small one, then three large ones reaching to, and sometimes beyond, the subcostal veins. These three large spots are followed by one or more smaller ones.

The forewing is crossed transversely by a band of chocolate brown almost parallel to the outer margin and about one-third from the apex. This band is forked from the costal margin to SC<sup>3</sup>, and is traversed for its whole length by a chain of dull purple spots. Between this band and the outer margin is an irregular row of dull purple and brown spots each standing on the edge of a hexagon. Half way between the main transverse band and the base of the wing is another irregular and broken band of spots, some chocolate and others dull purple. Between the nervures at outer margin is a row of dull purple spots.

Basal half of hindwing a most delicate salmon pink, outer half chrome yellow, more or less reticulated with pink spots standing mostly along the nervures.

*Underside* of both wings chrome yellow, heavily washed with pink on basal half, while outer half is spotted with pink; on the costal margins of both wings is a row of pinkish brown patches.

Head, thorax, end of abdomen and legs greenish wax yellow, metathorax and basal two-thirds of upperside of abdomen greenish pink. Underside of abdomen pinkish white.

Length of forewing: 52 to 80 mm.

Breadth of forewing: 25 to 38 mm.

Described from several bred *females* from Townsville, North Queensland, where the collector obtained also a number of *males*.

## ANOTHER SMALL CONTRIBUTION TO AFRICAN ORNITHOLOGY.

BY ERNST HARTERT.

THE following article is based on collections made by Dr. W. J. Ansorge during his third stay in the African Continent. A list of the birds collected during his second stay in Africa is given by me in the Appendix to Dr. Ansorge's book "Under the African Sun," to which I have sometimes to refer in the following pages. Occasionally birds from other collections, specially some collected by Dr. Felix Roth at Warri, in the Niger Coast Protectorate, have been discussed.

Dr. Ansorge has this time crossed Africa from east to west, taking from Uganda about the same route as Mr. A. B. Lloyd. Most of the localities mentioned are therefore to be found in Lloyd's book "In Dwarf Land and Cannibal Country" (London, J. Fisher Unwin, 1899).

From Mombasa Dr. Ansorge travelled to Uganda, collecting very interesting birds in the sandy plain of the Athi River and at Nairobi. From Uganda proper he marched westwards to Toro (or Toru, as Ansorge spells it), where a good number of birds were procured. Toro is the country east of Mount Ruwenzori, and a description and a map, showing some of the places where Ansorge collected, is given in Lloyd's book, p. 159. At Fort George, on Lake Albert Edward, the collector seems to have stayed for some time, then proceeded to "Karimia in Ussongora,\* Congo Free State," hence northwards to Fort Mbéni, or Béné, on the lower course of the Semliki, or, as it is here called, Kakibi River; then, entering the "Great African Forest," *i.e.*, the enormous primeval forest, inhabited by a Pygmy race, he travelled in a north-westerly direction to the Ituri River, which at its lower portion is called the Aruwimi, and sailing down the Aruwimi and Congo, reached the west coast, where he found a Belgian steamer ready to sail. He thus accomplished the journey in the marvellously short time of seventy-nine days from Fort George to London. The collections that could be made on such a record journey are of course very fragmentary, but they contain some highly interesting specimens. A box with probably some very good birds from East Africa is unfortunately lost, and has not been traced. A longer stay in the Great Forest would doubtlessly have yielded many wonderful things. On pp. 299—302 Mr. Lloyd has given some notes on the "animal life in the forest," but he is not a naturalist, and his description cannot be accurate, since "many species of gazelles, chimpanzee and gorilla" do not live there, or have not yet been identified, and we do not believe in hyaenas in the middle of the forest, although Mr. Lloyd mentions "leopards, panthers, wild cats, civets, hyaenas, and reptiles."

Of bird-life in the Great Forest Mr. Lloyd says: "Birds of every description and varied hue abound, parrots undoubtedly predominating, paraquets, swifts, owls, guinea-fowl, kingfishers, fish eagles, divers, kites, hornbills in great variety; pigeons, doves, honey-birds, and all kinds of night-birds. In the daytime it is delightful to sit and listen to the singing of the birds, their songs being so different from the bird-songs of Europe; some with deep musical sounds like the tolling of a

\* Spelt Ussogara by Dr. Ansorge, but on the maps I find Ussongora. This place must of course not be mistaken for the country of Usagara, in German East Africa. Ansorge's Karimia is the Karimi on the Isango, a continuation of the Semliki-Kakibi River, on Mr. Lloyd's and other maps.

bell. The black-and-white wagtail is so tame that he will sit within a few yards and pour forth his beautiful notes. The tiny honey-bird darts here, there, and everywhere, like streaks of light, issuing forth its twit, twit, as it lights upon some honey-bedewed blossom. Overhead the ungainly hornbill ploughs its way above the tree-tops, calling to its mate, and the screaming of the parrots as in great flocks they make their flight along the river banks, or through the tangled mass of vegetation overhead, is almost deafening. By the little streams are countless numbers of wonderful butterflies, some as large as swifts, and all (*sic*!) most gorgeously coloured. The insect life baffles description. . . .’ Exaggerated as this statement may perhaps be, it is of interest to hear it, since it seems to contradict the reports of the scarcity of bird-life in the Great Forest.

The birds collected by Dr. Ansorge belong to three more or less faunistically different countries. In the Athi Plain and at Nairobi he collected in the southern parts of the North-East African desert and steppe fauna, which reaches south at least to Masailand (cf. *Drepanoplectes jacksoni*, *Mirafra africana athi*, *Passer diffusus gongonensis* and others); then the so-called East African fauna was touched; while soon afterwards, without a very sharp line of demarkation, the West African area was entered (cf. *Corythaeala cristata*, *Columba unicincta*, and many others).

It may here be remarked that at present a general account of the birds of Africa is one of the greatest, if not the greatest, desideratum of ornithologists. The publications on African birds are so numerous, and especially in small contributions—often descriptions of one or two species or subspecies—and nearly all nations, as German, British, French, Swedish, Portuguese, Italian, American, Austrian, partake of the ornithological work in Africa, that it is most difficult, I think more difficult than in any other country, to be informed about all the literature. It is therefore to be hoped that the works of Professor Reichenow and Captain Shelley will soon appear.\*

I am obliged to my friends Professor Reichenow, Dr. Sharpe, and Mr. Grant for comparing some of the specimens with the types and other examples in their collections, and thank them for their kindness.

### 1. *Phalacrocorax africanus* (Gm.)

♂ ♀. Ituri River, twenty-second day from Fort Mbéni, 26. 5. 1899.

“Iris golden-brown. Feet black. Upper jaw dark grey with yellow edge, lower yellow.”

### 2. *Podiceps cristatus* L.

Lake Varangot, Fort Gerry, Torn, 13. 4. 1899.

### 3. *Nettapus auritus* (Bodd.)

♀ ad. Near Ripon Falls, Somerset Nile, 10. 3. 1899.

“Iris dark brown. Feet greenish black. Upper bill greenish grey with a greenish yellow patch on each side near the base. Lower bill pinkish grey with orange-yellow skin between rami.”

### 4. *Nettion capense* (Gm.)

♀ ad. Lake Varangot, Torn, Uganda Protectorate, 16. 4. 1899.

“Iris dark brown. Feet slate-blue; bill slate-blue with dark central greenish grey streak.”

\* While this passed through the press Part 1. of Vol. II. of Shelley's work has actually been issued.



5. **Oedicnemus vermiculatus** Cab.

♀ ad. Fort George, Lake Albert Edward, Torn, 26. 4. 1899.

6. **Hoplopterus spinosus** (L.)

♂ ♀. Fort George, Lake Albert; Edward, 26. 4. 1899, ♀, Salt lake Kikorongo, one day's march from Lake Albert Edward, 25. 4. 1899.

"Iris blood-red ; bill and feet black."

7. **Chettusia melanoptera** (Cretzschm.)

♂ ♀. Nairobi, British East Africa, 28. 1. 1899.

"Iris lemon-yellow ; red ring of bare skin round eyes, more developed in the *male*. Feet brownish-red, lighter on the thighs. Bill black."

8. **Chettusia inornata** (Swains.)

♀ ad. Lake Kikorongo, salt lake one day's march from Lake Albert Edward 25. 4. 1899.

"Iris lemon-yellow, inwardly shaded with greenish ; bill and feet black."

9. **Ochthodromus asiaticus** (Pall.)

♀ ♀. Athi Plain, British East Africa, 25. 1. 1899.

One of these shows beginning of moult on chest, the other not.

10. **Glareola pratincola** (L.)

Five *males*, Salt lake Kikorongo, Torn, 25. 4. 1899.

Only one has the throat quite unspotted, and in that specimen it is rather deep rusty buff. It would be interesting to investigate whether the Pratincole is really, as it is supposed to be, merely a migrant in Africa, or if a special darker race is resident in the Dark Continent.

11. **Galachrysea nuchalis** (Gray).

♂ ad. Enguatuara on the Ituri River, 31. 5. 1899.

"Iris dark brown. Feet copper red. Bill black with red base." This bird has the inner (not outer) webs of the secondaries white at base, its wing measures 6 inches ! Cf. *Cat. B. Brit. Mus.*, v. XXIV. p. 64. Is *G. emini* a different species ?

12. **Otis melanogaster** Rüpp.

♂ ad. Nakabimba in Toru, Uganda Protectorate, 2. 4. 1899. "Iris brown ; feet yellowish grey, becoming brownish grey below the knee, dark grey on the toes, especially the middle one. Bill : upper jaw dark grey with yellowish grey edges, lower yellowish grey."

13. **Fulica cristata** Gm.

Lake Varangot (Toru), Uganda Protectorate, 16. 4. 1899. "Iris blood-red ; feet slate-colour, darker on the joints and orange-red patches above the knees. Bill pale grey with a bluish tinge. Bare patch on forehead greyish white, terminating in two dark brown-red protuberances with orange-red tips."

14. *Gallinula chloropus* (L.)

♂ ♀. in nuptial plumage, Lake Varangot in Torn, Uganda Protectorate,  
13. 4. 1899.

15. *Limnocorax niger* (Gm.)

♂. Lake Varangot, Torn, 13. 4. 1899.

16. *Pterocles exustus* Temm.

♂ ♀. Campi-ya-Simba, British East Africa, 14. 1. 1899. "In both sexes iris dark brown : feet bluish grey ; bill greyish white."

Temminck described his *P. exustus* from West Africa and North-East Africa. The African Birds were therefore the "typical" ones, which means that they must be called *P. exustus exustus*, if subspecies are distinguished, and there is no doubt, in my opinion, that this can be done.

I have not been able to compare a series of Abyssinian skins, but as several writers have declared that they are like those from North-Eastern Africa, and in view of the close relationship of the fauna of North-Eastern Africa and Senegambia, I must take their similarity for granted at present. The North-East African birds (Abyssinia, Egypt) and those from Eastern Tropical Africa (Kilimanjaro, Machakos, Campi-ya-Simba) do not seem to differ and are above rather dark olive-brown, while the greater wing-coverts are much more yellow, especially on the tips. This is evidently pigment, and not at all due to staining. Bogdanow's name *P. ellioti* (*Bull. Ac. Sci. Petersb.* v. XXVII., p. 167, 1881) is based on one (!) Abyssinian example collected nearly seventy years ago by Rüppell. The differences he mentions are evidently due to the faded condition of this old veteran of a mounted specimen, and the white patch he describes is found in all adult males. *P. ellioti* is therefore, for the present, to be regarded as a synonym of *P. exustus*.

The wing of Central African adult *males* measures about 185 mm.

From this form differs the bird inhabiting the deserts of Somaliland, in being smaller, paler and more sandy isabelline on the upperside, chest and breast. The under tail-coverts in the one *male* at Tring are unspotted. The *female* is less thickly spotted on the foreneck, less blackish and more reddish on the upperside. The wings of two adult *males* and two *females* measure about 170 mm. This form might be termed

*Pterocles exustus somalicus* subsp. nov. (Type Donaldson Smith coll. Milmil,  
30. 7. 1894.)

A third distinct form is the Indian bird, which is lighter above than *P. exustus exustus*, not so dark olive-brown, but not so bright yellowish isabelline as *P. exustus somalicus*. The larger wing-coverts are paler and not so yellowish. The *females* show the same differences. This form might be named

*P. exustus orientalis* subsp. nov.

We have thus, for the present :—

*P. exustus exustus* : West and N.E. Africa generally, south to the Masai-steppes, Kilimanjaro and Arusha.

*P. exustus somalicus* : Somaliland.

*P. exustus orientalis* : India.

17. **Pterocles gutturalis saturator** subsp. nov.

(Type : Campi-ya-Simba, British E. Africa, 23. 4. 1898.)

♀ ♀. Athi Plain, British East Africa, 24. 1. 1899. " Iris chocolate-brown; feet bluish grey; bill bluish grey."

*Males* of *P. gutturalis* from British East Africa, the Kilimanjaro district and Bogosland have the rust-coloured extremities to the greater series of wing-coverts of a much deeper rufous colour, while those from Transvaal, Nyassaland and the Zambesi have them paler and somewhat more yellowish. The back and rump in the northern birds is also darker brown than in those from Southern Africa. The southern form being first described, the northern one requires a new subspecific name : *P. gutturalis saturator*.

The *females* of the two forms are perhaps not distinguishable, unless those of *P. gutturalis saturator* are more blackish above.

18. **Hagedashia hagedash** (Lath.)

♀. Bomili on the Ituri River, Congo Free State, 30. 5. 1899. " Iris blood-red; feet black with brick-red down the front of the toes and lower half of metatarsus; bill black with reddish brown tip, basal half of culmen bright red."

I think that the colour of the iris is given wrong, probably, the blood having broken out into the eyes, for the Hagedash has not red eyes.

I am inclined to believe that there are two subspecies of Hagedash, birds from N.E. and Eastern Africa being smaller and paler than those from the West African region, which have longer bills and darker breasts. Our material, however, is not sufficient to settle this question.

19. **Phoyx purpurea** (L.)

♀. Yanga on the Ituri River, Congo Free State, 29. 5. 1899. " Iris lemon yellow."

20. **Bubulcus ibis** (L.)

♀ ad., twentieth day from Fort Béni in Great African Forest, 24. 5. 1899. " Iris lemon yellow; bill lemon yellow."

21. **Columba unicincta** Cass.

An adult ♀ of this rare pigeon was shot at Diapanda, a Suaheli settlement in the Great African Forest, on the sixth day's march from Fort Béni. " The iris is blood-red; feet slate-blue; bill slaty blue, with paler tip; each eyelid with narrow crimson ring, followed by a fleshy brown area, and finally a crimson outer patch."

*Columba unicincta* is described from Gaboon (Agobai), and recorded also from Liberia by Büttikofer, who figured it in the Notes of the Leyden Museum v. VII. pl. 6. The specimen from the Great African Forest agrees perfectly with the original description as well as with Büttikofer's figure.

Dr. Ansorge says these pigeons are very shy and difficult to approach.

22. *Turtur semitorquatus* (Rüpp.).

Nairobi, 5. 2. 1899.

23. *Chalcopelia afra* (L.).

Dwangiri (Singo), Uganda, 28. 3. 1899.

24. *Tympanistria tympanistria* (Temm.).

♂ ♀ Kikanja, Toru, 3. 4. 1899. "Iris brown : feet purple-red ; bill black with purple tinge ; gape purple-red."

These specimens are darker on the back and smaller (wing ♂ 115, ♀ 110) than South African examples. There are probably two races.

25. *Vinago calva nudirostris* (Swains.).

Kichuchu, Toru, 5. 4. 1899.

26. *Pternistes cranchi* (Leach).

Specimens of both sexes from the Mokia River in Toru agree perfectly with typical *P. cranchi*. Young birds have a good deal of white on the abdomen. An adult *male* from Ngombe on the Congo has the rufous-brown edges to the feathers of the abdomen deeper rufous, but both Professor Reichenow and Mr. Grant are of opinion that this is not a subspecific character.

27. *Numida reichenowi* Grant.

♂ ad. Campi-ya-Simba, British East Africa, 13. 1. 1898. "Iris dark grey ; feet black ; upper jaw of bill dark grey-brown, lower bluish grey ; wattles blood-red, and a patch of similar colour on lower bill near the base, extending round the nostrils and over two-thirds of the helmet ; sides of throat bright blue, with black mottlings over the throat and neck."

28. *Numida ptilorhyncha* Licht.

♀ Nakabinba, Toru, 2. 4. 1899. "Iris golden brown ; feet pale chocolate, brown scaling in front ; upper jaw red-brown, lower yellowish brown ; upper rim of nostrils, and a double caruncular ridge between them, orange-red ; skin of chin and throat pale lilac ; the blue wattles have no speck of red ; skin round eyes lilac-black."

♂ Mokia River, Toru, 24. 4. 1899. "Iris dark brown ; feet dark brown ; bill reddish brown, but horn-grey towards tip ; wattles very pale blue ; two whitish blue spots on upper eyelid ; all the blue marks are whitish blue or white ; throat greyish black ; neck black ; no red spot on wattles ; bristly wart between nostrils reddish brown."

♂ ♀ Holulu River, tributary of Semliki River, Congo Free State, 6. 5. 1899. "Iris dark brown ; feet chocolate brown ; upper jaw dull red-brown near base, rest of bill dull greenish grey ; the blue markings are a mottling of dark and light blue ; wattles with a dark edge."

All these specimens have very short bristly tufts between the nostrils, and in the last-mentioned ♀ these tufts are entirely absent, although it doubtless belongs to this species. Probably all these Central African birds belong to an unnamed subspecies. O. Neumann has separated several races of *N. ptilorhyncha*, but it must be said that Jesse's Abyssinian skins in the British Museum do not bear out Neumann's character of the long tufts in the Abyssinian form, as they have the bristly bunches rather short. The markings on the outer webs of the primaries seem to vary considerably.

29. **Buteo augur** Rüpp.

♂♂ ad. Fort Gerry and Lake Varangot (1½ hour from Fort Gerry), Toru, Uganda Protectorate, 12. and 13. 4. 1899. "Iris dark brown; feet lemon-yellow; cere lemon-yellow; bill dark grey with bluish tinge near base of mandible; skin round eyes greenish yellow."

30. **Milvus aegyptius** (Gm.).

♂ ad. Nairobi, British East Africa, 2. 2. 1899. "Bill lemon yellow."

31. **Falco cuvieri** Smith.

♂ ad. Nairobi, 31. 1. 1899. "Iris dark brown; feet and cere lemon-yellow; bill dark grey, shading off into greenish grey near base."

32. **Poeocephalus aubryanus** Sonacé.

♀ ad. Sakarumbi, one day from Fort Mbéni, Congo Free State, 5. 5. 1899. "Iris orange; feet covered with small black scales with white edges; upper jaw of bill horn-grey with black tip, lower black."

33. **Turacus hartlaubi** (Fischer & Reichen.)

♂ ad. Nairobi, British East Africa, 5. 2. 1899. "Iris dark brown; feet blue-black; bill reddish brown."

34. **Corythaeola cristata** (Vieill.).

♀. Great African Forest, twentieth day from Fort Mbéni.

35. **Colius leucotis berlepschi** Hart.

Specimens from Fort George on Lake Albert Edward and Kitagwetoa in Toru (April), as well as from Buaia (Bnsori), Uganda (March 1899), are all referable to *C. l. berlepschi*, as separated from *C. leucotis leucotis* and *C. l. affinis* in Appendix p. 333 to Ansorge's "Under the African Sun" (London, 1899).

36. **Coccystes afer** (Licht.).

♂ ♀. Karimia, Ussongora, Congo Free State, 1. 5. 1899. A uniform blue egg, cut out of the female's body, measures 26 by 20·5 mm.



37. *Centropus superciliosus* (Hempr. & Ehrb.).

♂. Karimia, Ussongora, 1. 5. 1899. "Iris blood-red."

38. *Chrysococcyx cupreus* (Bodd.) ?!

An evidently young ♀ was shot on the second day's march from Fort Mbéni. "Its iris was pinkish-brown; the feet yellowish-green; bill black." It differs from young of *C. cupreus* in the very narrow barring of the underside, each feather having four or five distinct pale whitish buff and bronzy green bars. I am inclined to think that this bird is the young of an undescribed form of *Chrysococcyx* nearest to *cupreus*.

39. *Indicator indicator* (Gm.).

Wemi River, Torn, 21. 4. 1899. "Iris ochre. The song of this bird is a constant 'wit-purr, wit-purr.'"

40. *Tricholaema lachrymosum* Cab.

♂ ad. Kitagwetoa (Torn), 6. 4. 1899. "Iris orange-gold; feet greenish grey; bill black." The spots on the sides of this *male* are round, not ovate as in the *female* recorded from Masongoleni in British East Africa (Ansorge's "Under the African Sun," p. 335).

41. *Melanobucco bidentatus aequatorialis* Shell.

♀ ad. Kichuchu, Torn, 5. 4. 1899. "Iris brown, bare; skin around the eyes greenish yellow."

42. *Barbatula subsulphurea* (Fras.).

♀. Kitima, Government station on the Ituri River, twenty-first day's march in Great African Forest from Fort Béné. "Iris brown; feet deep grey; bill black."

43. *Melanobucco leucocephalus* (Defil.).

♂ ad. Kikanja, Torn, 3. 4. 1899. "Iris brown."

44. *Iynx pectoralis* Vig.

Nairobi, British East Africa, 5. 2. and 27. 1. 1899.

45. *Thripias namaquus* (Licht.) (? an snbsp.).

A *male* from Ussongora, collected 17. 11. 1889 by Emin Pasha, has the wing longer than four South African *males*. The wing in the Ussongora bird is fully 5.5 in. long. In the *Cat. B. Brit. Mus.* v. XVIII. p. 307, 5.2 is given as the length of the wing, those before me measure 5.2 to 5.3 inches. The bars on the underside seem also to be narrower in the Ussongora bird.

46. *Thripias namaquus schoensis* (Rüpp.).

A *female* shot at Nairobi, 3. 1. 1899 by Dr. Ansorge. "Iris blood-red ; feet and bill greenish grey."

47. *Dendropicus poecilolaemus* Rehw.

♀. Kinyomozi (Torn), 4. 4. 1899. "Iris red-brown ; feet greenish-grey ; bill greenish slate."

48. *Dendropicus tropicalis* Rehw.

♀. Kichuehu (Torn), 5. 4. 1899. "Iris red." ♀ Ngombe, Congo, August Bohndorff coll.

49. *Dendromus permistus* Rehw.

♂ ♀ jnv. Sakarumbi, one day's march from Fort Béni, 5. 5. 1899. "Iris dark brown ; feet pale green ; bill grey with greenish blue tinge."

50. *Iyngipicus obsoletus ingens* subsp. nov.

One adult *male* from Nairobi differs from specimens from Senegambia and Gambaga in being considerably larger and darker brown. Not having specimens from N.E. Africa for comparison, I sent the bird to Prof. Reichenow, who kindly writes : "Das Exemplar ist wesentlich dunkler im Ton der brannen Gefiederfärbung, als Stücke von Nordostafrika, auch grösser." Therefore, although I am not generally inclined to describe subspecies from the evidence of single specimens, I do not hesitate to separate this gigantic specimen under the name of *ingens*. The measurements of the type are : wing 90 mm. (3.55 inches) ; tail 46 ; metatarsus 14 ; culmen 21 mm. "The iris is red-brown, feet greenish grey ; bill slate grey."

51. *Coracias caudatus* L.

♂. Nairobi, British East Africa, 2. 2. 1899. Outer rectrices sprouting.

52. *Eurystomus afer* (Lath.).

♂ ad. Kilgirma (Buekulla), Uganda, 29. 3. 1899.

53. *Eurystomus gularis* (Vieill.).

♀ ad. Kitima, Government station on the Ituri River, twenty-first day from Fort Béni in Great African Forest.

54. *Lophoceros erythrorhynchus* (Temm.).

♂ ad. Kinani, British East Africa, 2. 5. 1898. "Iris light yellow."

55. *Lophoceros melanoleucus* (Licht.).

♂ ad. Kibwezi, Ukamba, British East Africa, 28. 4. 1898. "Iris whitish yellow ; feet black ; bill red."

56. *Lophocerus fasciatus* (Shaw).

Tambue, Government station on the Ituri River, twenty-second day from Fort Béni, in Great African Forest. "Iris dark brown; feet purplish black; bill straw-yellow, with deep red tip, line on upper jaw and under surface of lower jaw." This specimen is marked ♂, but according to the *Catalogue of Birds* it is a ♀.

57. *Halcyon chelicuti* (Stanley).

Kaboa (Buekulla), Uganda and Holulu River (tributary to the Semliki), Congo Free State.

Glancing over our series of *H. chelicuti*, it seems to be evident that South African Birds (Transvaal and Natal) are larger and have longer bills, while being generally somewhat paler. Their wings measure 82, 84, 85, 86, 87, 87 mm. Specimens from Senegambia and Somaliland are much smaller, the wings measuring only 76, 76, 79, 80 mm., and their bills are smaller. The former would be *H. chelicuti damarensis* Strickl., the latter *H. chelicuti chelicuti* (Stanl.) 1834. The difficulty in separating these two forms is presented by the examples from Tropical Africa, West Africa to East Africa, which are intermediate, their wings measuring 75, 76, 78, 80, 80, 81, 82, 83, 83, 83, 84, 85 mm., but they have always much smaller bills. Thus it would seem, that all the forms from North-East Africa and Senegambia to about the Zambesi cannot be separated at present, those from South Africa, however, being *N. chelicuti damarensis*.

58. *Alcedo quadribrachys guentheri* Sharpe.

♂. Panga, on the Aruwimi River, 1. 6. 1899. "Iris dark brown; bill black; feet coral red." This form, although easily distinguishable from true *quadribrachys*, can hardly be looked upon more than a subspecies of the latter, being only smaller and of a lighter green on the back, which is more like cobalt.

59. *Merops persicus* Pull.

♀ ad. Kasesi (Torn), 22. 4. 1899.

60. *Merops apiaster* L.

Nakabimba (Torn), 2. 4. 1899.

61. *Melittophagus gularis australis* Rehw.

♀ ad. Kitima, Government station on the Ituri River, twenty-first day from Fort Béni, in Great African Forest, 25. 5. 1899. "Iris blood-red, feet dark purple-black; bill black."

This specimen agrees in every respect with another Congo skin, and both differ from twenty skins from Liberia, Sierra Leone, and Gold Coast in the following characters:—

There are less blue feathers on the forehead. The superciliary pale cobalt-blue superciliary streak is quite indistinct, and no trace of it is continued beyond the eyes. The cobalt-blue longitudinal spots on the breast are smaller, and the blue on the rump is generally darker.

*M. gularis australis* is therefore a very distinct subspecies. (Cf. *Journ. f. Orn.* 1885, p. 222; *Cat. B. Brit. Mus.*, v. XVII, p. 51.)

62. *Melittophagus cyanostictus* (Cab.).

Mubende (Bucknulla), Uganda, Nakabimba (Torn) and Fort George on Lake Albert Edward.

This Bee-eater has been somewhat unfortunate with regard to its name. Cabanis first described it under the name of *Merops cyanostictus*, as a doubtful variety of "*Merops erythropterus*" in 1869 in v. d. Decken's *Reisen in Ost-Afrika*, v. 3, p. 34, and elevated it to specific rank as *Melitta cyanostictus* in 1875, in *Journ. f. Orn.* v. 2k, p. 340. There is not the slightest doubt from the description and distribution (Natal, Loango, and East Africa), given by Cabanis, that his *M. cyanostictus* is the bird which has been mixed up with *M. minutus*=*erythropterus*=*pusillus* by Finsch and Hartlaub (*Vög. Ost-Afrika's*, pp. 188-91), Dresser (*Monogr. Merop.* p. 111) and others, while Sharpe (*Cat. B. Brit. Mus.* v. XVII. p. 43, 1892), who must have misunderstood Cabanis' description, renamed it *M. meridionalis*, applying at the same time the name *M. cyanostictus* to a bird found in Shoa, Somaliland and the coast districts of East Africa to Mombasa, Dar-es-Salaam, Lamu, and Melindi southwards. This species, which is characterized by a broad blue frontal band, connected with an equally broad blue superciliary stripe, has apparently no name, and I have named it

63. *Melittophagus sharpei*,

in honour of our friend Dr. Sharpe, who worked out the *Meropidae* for vol. XVII. of the *Catalogue of Birds* (Type: ♂ ad. The Haul, Somaliland, 22. 7. 1894, Donaldson Smith coll.).

With regard to the synonymy of the *Melittophagus meridionalis* in the *Catalogue of Birds* (recte: *M. cyanostictus* Cab.), I may add that *Merops angolensis* (ex Brisson, *Guêpier d'Angola*) is rightly quoted with a ? as a synonym, the description being quite obscure. On the other hand, *Merops variegatus*, Finsch and Hartlaub, *Vög. Ost-Afrika's*, p. 191, is not correctly quoted under this species, the description leaving no doubt that the authors really described the true *M. variegatus* Vieillot's, while they mixed *M. pusillus* and *cyanostictus* Cab. under their *M. minutus*.

64. *Irrisor jacksoni* Sharpe.

♀ ad. Nairobi (B. E. A.), 29. 1. 1899. "Iris dark brown, feet dark copper-red, bill blood-red, eyelid red."

The adult female differs from the adult male only in the shorter and straighter bill (♂ 40, ♀ 35 mm.), and considerably smaller feet. The greater extension of the green on the head is not a character of the female sex, but probably due to immaturity. (Cf. *Cat. B. Brit. Mus.* v. XVI. p. 21).

Another specimen, adult ♂, was shot on the second day in the Great African Forest from Fort Mbéni, on May 6th, 1899. It agrees in every detail with ♂. *Irrisor jacksoni*, except that the bill is much higher at the base and 45 mm. long. It would be rash to establish a new subspecies without further evidence, but I hardly think that this is typical *I. jacksoni*.

65. *Hirundo senegalensis* L.

♀ ad. Kabuka (Singo), Uganda, 27. 3. 1899. "Iris dark brown." ♀ ad. Great African Forest, fourth day from Fort Béné, 8. 5. 1899. ♂ ad. Ituri River, twentieth day from Fort Béné, 24. 5. 1899.

It would be worth while to measure a series of Senegambian skins and others, in order to find out if there are several subspecies. We have only one bird from Moshi (Wagudugn) from those regions. This has a wing of 155 mm., although it is a ♀. Our other examples measure :

♀ Kabnka wing 141, ♀ African Forest 140, ♂ Ituri River 141, ♂ Unyoro 141, ♀ Unyoro 145 mm. It also seems to me that the Moshi specimen is somewhat paler on the rump.

66. *Hirundo rustica* L.

Two specimens, with the underside rather reddish, were shot at Nakabimba (Torn) on April 2nd, 1899. They were still both moulting their primaries.

67. *Hirundo nigrita* Gray.

♂ ad. and ♀ juv., Bafwazabangi, on the Ituri River, 28. 5. 1899. The young bird is dusky brown, and has the white patch on the throat larger than the adult bird.

68. *Psalidoprocne nitens* Cass.

Kitima, on the Ituri River, 25. 5. 1899.

69. *Melaenornis edolioides* (Swains.).

Fort George and Kikanja, in Torn.

70. *Cassinia frazeri* (Strickl.).

♂ Olinga (Snaheli settlement in the Great African Forest, eighth day from Fort Béni), 12. 5. 1899.

71. *Bradyornis murinus* F. & H.

Karimia (Ussongora), Kichnehu (Torn), April and May.

72. *Tarsiger stellatus orientalis* Fisch. & Rehw.

♂ Nairobi, 30. 1. 1899. (Cf. App. to Ansorge's "Under the African Sun," p. 338).

73. *Platystira cyanea* (P. L. S. Müll.).

Kichnehu, Torn, 5. 4. 1899.

74. *Batis puella* Rehw.

Nairobi, Dwangiri in Uganda, Kimbugu in Torn.

75. *Bias musicus* (Vieill.).

♂ ad. Great African Forest, Ituri River, twentieth day from Fort Béni, 24. 5. 1899. "Iris and feet lemon-yellow, bill black."



76. **Elminia longicauda** (Swainson).

Diapanda on the Ituri, Uganda and Unyoro. *Elminia theresita* does not seem to differ at all. Neither Reichenow nor I can see the supposed differences.

77. **Artomyias fuliginosa** J. & E. Verreaux.

♂ ♀ Diapanda, Suaheli settlement in the Great Forest, sixth day's march from Fort Béni, 10. 5. 1899. "Iris greyish brown."

78. **Alseonax pumila** Rehw.

♀ ad. and ♂ pull., Nairobi, 5. 2. 1899. "Iris dark brown, bill and feet black." The pullus is above spotted (like all young flycatchers) with rusty buff, and the feathers of the underside are fringed with blackish brown.

79. **Muscicapa infulata** Hartl.

♂ ad. Lake Varangot in Toru, 16. 4. 1899.

80. **Muscicapa lugens** (Hartl.).

♀ juv. Yanga on the Ituri River, 29. 5. 1899. Tips of wing-coverts rusty brown, edges of secondaries buff.

81. **Muscicapa toruensis** sp. nov.

♀ ad. Fort Gerry, Toru, 9. 4. 1899. Differs from *M. caeruleascens*, its nearest ally, in being much more and uniform grey, not so whitish on the throat and middle of abdomen, in having grey, not white, under wing-coverts, and a larger bill. *Muscicapa nyikensis* Shelley from Nyassaland is much larger, whiter below, and has the lores and forehead white. The latter is almost a *Dioptrornis*. Wing of *M. toruensis* 81, tail 66, culmen from forehead to tip 17.5, from nostrils to tip 9.5 mm. "Iris dark brown, feet black, bill slate-colour with black tip."

82. "**Dioptrornis**" **fischeri** Rehw.

Nairobi, 28. 1. 1899. "Iris and feet chocolate-brown, bill bluish grey with dark grey tips." I do not consider that the genus *Dioptrornis* deserves to be separated generically from *Muscicapa*, there being no structural differences of any importance.

83. **Laniarius aethiopicus major** (Hartl.).

Kaboa (Buekulla) and Mondo in Uganda Proper, March and April 1899. "Iris reddish brown, feet slate-blue, bill black."

84. **Laniarius erythrogaster** (Cretzschm.)

♂ Dwangiri (Singo), Uganda, 28. 3. 1899. Lake Kikorongo (salt lake near Lake Albert Edward), 25. 4. 1899. "Iris straw-yellow."

85. *Dryoscopus angolensis* Hartl. (an subsp. ?)

One *male* from Diapanda in the Great Forest, sixth day from Fort Bèni, 10. 5. 1899, differs from typical *D. angolensis* in the Berlin and British Museums,\* in having the crown not so black, but more slate-colour, the back and wing-coverts darker, the roots of the rump-feathers white, not greyish. I cannot, from the single specimen, venture to say whether this is a new form or not.

86. *Telephonus senegalus* (L.).

Fort George, Mokia River, and Kitagwetoa in Toru.

87. *Telephonus minutus* Hartl.

Lake Varangot and Kinyomozi in Toru. "Iris pinkish red."

88. *Lanius excubitorius* Des Murs.

Kichuchu and Butiti in Toru, April 1899. "Iris brown, feet and bill black."

89. *Lanius collaris humeralis* Stanley.

♂ ad. Nairobi, 26. 1. 1899, ♂ ♀ ♀ juv. Nairobi, 26, 27, 29. 1. 1899, ♀ ad. Lake Varangot, 16. 4. 1899.

✓ 90. *Corvultur albicollis* (Lath.).

♂ ad. Fort Gerry, Toru, 14. 4. 1899. "Iris dark brown." The feathers on head and neck are liver-brown, but some sprouting new feathers show that this colouration is merely due to the age of plumage.

91. *Dicrurus afer* (Licht. sen.).

♂ ♀ Kikanja in Toru. "Iris blood-red." The ♀ is much smaller than the ♂.

92. *Oriolus larvatus* Licht.

♂ ad. and imm. Kikanja (Toru), 3. 4. 1899. "Iris blood-red." These are large birds and apparently not distinguishable from South African specimens. The wing is about 140 mm. long. *O. rolleti* is evidently merely a smaller northern race of *O. larvatus*, with the wing not more than about 125—129 mm., but two Somaliland skins, collected by Dr. D. Smith, have the wings 133 mm. long. The distribution of the two forms, *O. larvatus larvatus* and *O. larvatus rolleti*, must therefore be worked out in greater detail.

\* The former—three from Cameroons—compared for me by Prof. Reichenow; the latter—one single specimen only—by me.

✓ 93. *Oriolus laetior* Sharpe.

♂ ad. Great African Forest, thirteenth day's march from Fort Béni, 22. 5. 1899. "Iris blood-red, feet bluish grey, bill pinkish red." This oriole has been mixed up with *O. brachyrhynchus* for a long time. It differs from the latter, of which I know specimens from Sierra Leone and Liberia only, in the following characters:—The back is lighter yellowish green; the yellow collar wider and more spread over the back, the lesser upper wing-coverts are golden-yellow, not olive-green as in *O. brachyrhynchus*; the tail and wings are lighter and less tinged with olive. Sharpe (in *Bull. B. O. Club*, no. 48, November 1897) described this form as differing from *O. brachyrhynchus* "in being smaller, and having a conspicuous yellow collar, the yellow also being spread over the mantle." The smaller size, however, attributed to this form, is not apparent in the specimens before me. *O. brachyrhynchus* has also a yellow collar, but it is less clear and narrower. *Oriolus laetior* differs from *O. luteatus* and *O. luteatus rolleti* in being smaller, having a smaller white alar speculum, the conspicuous golden yellow shoulder, and in having the outer edges of the secondaries and greater wing-coverts grey. The presence of an alar speculum (the tips of the primary coverts being white), the yellow least wing-coverts and grey edges on the wing, separate *O. laetior* also at once from *O. nigripennis*.

✓ 94. *Lamprocolius glaucovirens* Elliot.

♂ ad. Great African Forest, seventh day's march from Fort Béni, 11. 5. 1899. "Iris almost white with faint yellow tinge; bill and feet black." The head in this species is not steel-blue in any Congo specimen before me, nor on fig. 2 pl. VII *Cat. B. Brit. Mus.* v. XIII. These figures are not very accurate, and do not fully agree with nature, nor with the descriptions (pp. 172, 173). *L. glaucovirens* is very closely allied to the Senegambian *L. splendidus*, and perhaps only subspecifically separable.

95. *Lamprocolius chalybeus* Ehr.

♂ ad. Nairobi, 28. 1. 1899. "Iris light yellow."

96. *Lamprotornis purpuropterus* Rüpp.

Dwangiri (Singo) in Uganda, Karimä in Ussongora, Congo Free State.

97. *Pholidanges verreauxi* Bocage.

♂ ad. Msarosaro, Uganda, 11. 3. 1899.

98. *Buphaga erythroryncha* Stanley.

♂ ♀ Luba's (Usoga), Uganda Protectorate, 9. 3. 1899.

The four skins before me agree fully with the description, except that the *females* do not differ from the *males* except in their smaller size, the wing being about 5 mm. shorter. The birds described as the females by Reichenow (with a whitish belly and under tail-coverts) may possibly be immature. Dr. Ansorge's birds are probably not sexed wrongly, such mistakes occurring very seldom in his collections, and their smaller size makes an error improbable.

99. *Sitagra ocularia crocata* (Hartl.)

♂ ad. Kitagwetoa in Torn, 6. 4. 1899. "Iris: inner circle greyish-white, outer pale yellow. Feet pale slate-blue, bill black."

100. *Melanopteryx nigerrima* (Vieill.)

Bafwazabangi, on the Ituri River, 28. 5. 1899. "Iris bright lemon-yellow."

101. *Hyphantornis fischeri* (Rehw.)

Fort George, 26. 4. 1899. "Iris dark brown."

102. *Hyphantornis xanthops* Hartl.

Kitagwetoa and Kinyomozi in Toru, April 1899. "Iris pale golden yellow, feet pale brown, bill black."

103. *Hyphantornis castanops* (Shelley).

Kichuchn, Kinyomozi and Butiti in Toru, April 1899. "Iris golden yellow, bill black. feet pale brown."

104. *Hyphantornis abyssinicus* (Gm.)

Typical *males*, not differing from Abyssinian specimens, were procured at Kahangi in Toru, and near Fort George on the Albert Edward Lake. One from Kampala in Uganda has the black slightly more extended towards the nape, and was therefore recorded by me as *H. bohndorffi* Rehw. in Ansorge's "Under the African Sun," p. 343). However, I am now of opinion, that those from Uganda and Unyoro must be called *abyssinicus*, while males from Stanley Falls (type or typical specimens before me) have the black of the crown extended in the middle for about 4 to 8 mm. more backwards. They were named *bohndorffi*, but are merely a slight subspecies of *H. abyssinicus*. Males from Bafwazabangi and other places on the Ituri River are rather more like typical *abyssinicus*, but one or two have the black intermediate in extension between the two forms. This is, of course, not very easy to observe, if the skins are not first-rate; and those before me are not so.

105. "*Ploceus anomalus*" Rehw.

This interesting form is described from a single young bird by Reichenow in the *Journ. f. Orn.* 1887, p. 214. Three young birds, collected by the late Mr. Bonny in the camp of the notorious "Rear-column" at Yambuga, on the Aruwimi River, have been examined by Prof. Reichenow and found to be the same as his *Ploceus anomalus*. All three are evidently immature, two have no black feathers on the throat, while the third, very mutilated one, has a black throat. The first primary is in length between that of a *Hyphantornis* and a *Pyromelana*, and the tail resembles more that of a *Pyromelana*. Unfortunately the adult male is not yet known.

106. *Icteropsis pelzelni* (Hartl.).

♀. Fort George, 27. 4. 1899. "Iris brown."

107. *Drepanoplectes jacksoni* Sharpe.

A good series of this fine bird, described and beautifully figured in the *Ibis*, 1891, p. 246, pl. 5, was obtained at Nairobi on January 31st, 1899. The adult *males* have the "iris dark brown; feet mauve-black; bill light greenish with black near gape and along the edges of the lower bill." ♀ "Iris dark brown; feet light brown; lower brownish grey."

✓ 108. *Penthetria eques* (Hartl.).

Holulu River (tributary of the Semliki), Congo Free State, 2. 5. 1899. ♂ ad.: "Iris dark brown; feet black; bill slate-blue."

109. *Urobrachya phoenicea* (Heugl.).

Banda (Chagwe), in Uganda Proper: Kikauja, in Toru; Holulu River, in the Congo Free State.

✓ 110. *Pyromelana nigrifrons* Böhm.

♂♂. Kasesi, in Toru, and Fort George. "Iris dark brown; feet pale brown; bill black." In both these specimens the chin shows irregular black spots.

111. *Plocepasser melanorhynchus* Rüpp.

♂ ad. and nestling, Campi-ya-Simba, 13. 1. 1899. ♂ ad.: "Iris red-brown," nestling, "Iris dark grey." Colour and markings of the nestling are exactly as in the adult *male*!

112. *Philetaerus arnaudi* Bp.

Campi-ya-Simba, 17. 1. 1899. "Iris red-brown."

✓ 113. *Spermestes stigmatophorus* Rehw.

Tambue, Government station on ferry across Ituri River, twenty-second day in Great African Forest from Fort Béni.

114. *Spermestes fringilloides* (Laf.).

From various places on the Ituri River.

The difference in size between various individuals is remarkable, but it does not seem to be geographically limited. Some specimens from Liberia before me look much darker on the back, but they have been in spirits, although this is not said on the labels.

115. *Lagonostica brunneiceps* Sharpe.

Mondo, in Uganda Proper. (See Ansorge's "Under the African Sun," Appendix, p. 345.)



✓ 116. *Pytelia ansorgei* Hart.

One *male* in a wretched condition—the head smashed—was shot on the Wemi River, in Toru, on April 21st, 1899. The bill is slate-blue, blackish grey towards the tip. The crown (and apparently the head all round) deep black. Hind-neck, breast, abdomen, thighs, and under tail-coverts slaty or ashy grey; back rump and upper tail-coverts golden olive. Quills and upper wing-coverts black with broad edges of greenish olive, thus outwardly appearing greenish olive. Sides of chest golden olive. Under wing-coverts and inner quill-lining white. Tail black, outer rectrices more slate-colour. "Iris and feet dark brown." Wing 51, tail 40, metatarsus 12, bill 9 mm. (*Bull. B. O. Club*, December 1899).

117. *Nigrita canicapilla sparsinguttata* Rehw.

Kichuchu, in Toru, 5. 4. 1899. "Iris ochre-yellow."

This form, differing from *N. canicapilla canicapilla* only by the lesser number of spots on the wing, which are restricted to the smaller series of wing-coverts, can only be regarded as a geographical race of the latter.

118. *Symplectes reichenowi* Fischer.

♂ ♀ ad. Nairobi, 30. 1. 1899. "Iris in both sexes yellow: feet light brown; bill black."

✓ 119. *Symplectes stuhlmanni* Rehw. (*Orn. Monatsber.* v. 1. p. 29 (1893).

Kawelli (Buekulla), in Uganda; Kitagwetoa, in Toru; Masindi, in Unyoro. "Iris in the male ochre, in the female light yellow; bill slaty black; feet pale brown."

120. *Passer motitensis rufocinctus* Fisch. & Rehw.

♂ ♀. Nairobi, 27. 1. 1899. "Iris straw-yellow; feet dark grey with a slaty tinge, bill deep grey, almost black."

It is evident that *P. rufocinctus* and *shellegi* are only geographical forms of the same group as *motitensis*. They may be compared as follows:—

a. *Passer motitensis motitensis* A. Smith.

1849, A. Smith, *Illustr. Zool. S. Afr.* pl. 111; 1888, Sharpe, *Cat. B. Brit. Mus.* v. XVI. p. 324

Larger, wing 88 mm., bill very thick and high, about 12 mm. long, sides of head almost white (S. Africa).

b. *Passer motitensis rufocinctus* Fisch. & Rehw.

1884, *Journ. f. Orn.* p. 55; 1891, Sharpe, *Ibis* p. 256.

A little smaller, wing 78 mm., bill equally long, but much less high, sides of head grey (Masailand).

c. *Passer motitensis shelleyi* Sharpe.

1891, *Ibis* p. 256 : *P. motitensis* Henglin and Brehm (non Smith!).

Smaller and paler than forms *a* and *b*, wing 74 mm.; bill short and thick, about 10 mm. long; sides of head white as in *P. motitensis motitensis*. The black patch behind the ear-coverts is present, more or less, in all the three forms, but it is more conspicuous and larger in *P. m. shelleyi*. Kordofan (Melpesz, Brehm. coll.) and Lado (Emin coll.).

121. *Serinus* (an potius *Crithagra*) *albifrons* Sharpe.

1891, *Ibis* pp. 118, 255.

♂. Nairobi, 30. 1. 1899. "Iris and feet light brown; bill brownish grey; lower bill greyish white." This specimen agrees with Dr. Sharpe's description, but it has five white feathers on the crown.

122. *Fringillaria tahapisi* (A. Smith).

♂ ♀. Fort George, on Lake Albert Edward. 29. 4. 1899. "Iris dark brown."

123. *Passer diffusus gongonensis* Oust.

Nairobi. "Iris sepia: feet pale brown: bill black."

This is a distinct subspecies of *Passer diffusus*, nearest to the form to be called *P. diffusus swainsoni*. It is best diagnosed as follows:

Formae "*Passer diffusus swainsoni*" nominandae colore simillimus, sed differt magnitudine ingente, rostro altiore, alis longioribus. Altit. rostr. 10—11 mm., al. 90—95 mm.

*Hab.* Gongoni, Witu, Lamu, Nairobi, in Africa orientali. In 1890 Dr. Oustalet described this form as the representative of a new genus in the *Naturliste*, calling it *Pseudostruthus gongonensis*. He diagnosed the genus and species as follows:

"*Pseudostruthus*, novum genus ex familia *Ploceidarum*, rostro crassiore a generi *Ploceipasserum* diversum."

"*Pseudostruthus gongonensis*, nova species *Passeri diffusi* coloribus simillimus, sed rostro multo crassiore alisque longioribus valde diversus."

A detailed description is then added, which leaves no doubt that this form is meant.

While Oustalet created a new genus of the family *Ploceidae* for this sparrow, which, it must be said again, does not agree with *Passer diffusus*, but with *swainsoni*, Berlepsch enumerated it as *P. swainsoni* in the list of Witu and Lamu birds in *Abhandl. Senckenb. Nat. Ges.* vol. XXI. pp. 481, 483, calling, however, attention to the enormous size of these specimens, and British ornithologists have not separated it from *P. d. swainsoni*. Although I am decidedly of the opinion that this form must be separated from *P. d. swainsoni*, I cannot consider it to be more than a subspecies or geographical race of the latter, and I regard it as most unfortunate that in ornithology the larger size and higher culmen of a bird is ever thought to be sufficient for a new genus, while the entire similarity in colours is deliberately disregarded.

I am grateful to my friend Dr. Sharpe, who called my attention to Professor Onstaelet's description of *Pseudostruthus*, or I would most likely have given a new subspecific name to this large form of African sparrows.

I must add that *Passer swainsoni*, differing only in its dark ashy grey sides of the head and crown, its rather grey underside and less whitish throat and abdomen from *diffusus*, must be united with the *diffusus* group, and kept as a subspecies of the latter. For those who make bold to separate *swainsoni* and *diffusus* specifically, *Passer gonyonensis* will also be a species in their sense, being the most distinct of all these forms.

#### 124. *Passer diffusus ugandae* Rehw.

♂ Kaboa (Buekulla), Uganda, ♂ ♀ Fort George, Torn, end of April, Kitima, Government station on the Ituri River, twenty-first day from Fort Béni, in Great African Forest, 25. 5. 1899, ♂ Bafwazabangi, on the Ituri River, 25. 5. 1899. All these specimens seem to belong to exactly the same form, and, if separable from typical *P. diffusus*, must be called *P. diffusus ugandae* Rehw. This form has been separated by Professor Reichenow in *Orn. Monatsber.*, v. VII. p. 199 (December 1899), on account of its red-brown back which approaches the colouration of the rump, and its very long wings: measurements of the latter are not given. The length of the wing I cannot fully appreciate. The wings of sixteen skins from Uganda, Unyoro, Torn, and the Upper Congo region have the wings 78 to 85 in length: six from Natal about 80 to 82: one from Nyassaland 86 mm. The more reddish brown back, however, of the Central African birds is distinctly visible, if compared with the (typical) South African birds.

On the same page Professor Reichenow names the specimens from Mangu in the Togo Hinterland *Passer diffusus thierrii*, in honour of the energetic collector, Lieutenant Thierry. He informs us that they are strikingly pale on the upperside. This I find to be the case in some Senegambian skins in the Tring Museum, and they seem also to be smaller, the wings measuring only 79 to 81 mm. The fauna of Senegambia agreeing with the Mangu fauna, the Senegambian (and Mangu) form must, I think, bear the name *Passer diffusus gularis* Lesson, 1839. It remains to be found out whether there is again a darker-coloured race in the forest region of West Africa. I have before me, in the Tring Museum, a *male* brought to England by a palm-oil ship from the West Coast, and one collected by Ussher in Fantee. Both have the wings long (83 and 84 mm.), and the former appears very deep red on the back. Perhaps the sparrow collected by me at Loko on the Benué, and a series of Niger skins, can throw a light on this question. If they are different they would have to bear the name *occidentalis* of Shelley, under which I recorded them in the *Journ. f. Orn.* for 1886 p. 584.

We would then have in Africa the following forms of sparrows of this group:—

1. *Passer diffusus diffusus*: South Africa. Back rather ashy brown, in sharp contrast to the rump. Generally large.

2. *P. diffusus ugandae*: Central Africa (Uganda to Congo). Back rufous, not in such a sharp contrast to the rump (? smaller than No. 1).

3. *P. diffusus occidentalis*: West African forest region. Deep rufous brown above. Wings rather long. *This form is possibly not separable from P. d. ugandae*, which then would have to be called *occidentalis*.

4. *P. diffusus gularis*: Senegambian region to Niger, as far as the "Steppen-gebiet" reaches, and Lado (Emin). Paler above, wing rather short. (Synonym *P. d. thierryi*.)

5. *P. diffusus swainsoni*: North-East Africa. Darker grey on the underside; throat and abdomen less whitish. Rather large.

6. *P. diffusus gongonensis*: Gongoni, Witn, Lamu, Nairobi, in East Africa. Like *P. d. swainsoni*, but with enormous bill and long wings.

#### 125. *Anthus pyrrhonotus* (Vieill.).

♀ ad. Fort George, Toru, 28. 4. 1899. (Cf. *Cat. B. Brit. Mus.* X, p. 555.)

#### 126. *Anthus rufulus cinnamomeus* Rüpp.

Nairobi and Fort George, common.

I have named this bird as above, since I am not fully convinced that the Indian and African forms are quite the same. The latter seems to be more brownish above and the legs lighter (yellowish brown according to Dr. Ansorge's labels). I am convinced that Vieillot's name *rufulus* refers to the Indian form of this pipit, and that the name *rufulus* therefore cannot stand for the *Certhilanda*, to which it is likewise applied in the *Cat. B. Brit. Mus.* This latter will have to be called *Certhilanda albobasiata* Lafr. (Cf. *Cat. B.* X, p. 574 and XIII, p. 515.)

#### 127. *Motacilla flava* L.

♂ ad. Luba's (Usoga), Uganda Protectorate, 9. 3. 1899, ♀ Fort Gerry, 10. 4. 1899.

#### 128. *Mirafra africana* (A. Smith).

This lark must be divided into four geographical representative forms, according to the present state of my knowledge.

##### a. *Mirafra africana africana* (A. Smith).

South Africa, evidently south of the great mountain range. Wing in males 96—102, females 94 mm. Colouration as described in detail by Sharpe in *Cat. B. Brit. Mus.* XIII, p. 608.

##### b. *Mirafra africana transvaalensis* subsp. nov.

Transvaal. Wing in males 96—98, females 87 mm. Bill and feet smaller, colouration more rufous, the rufous colour on the crown not confined to the nape, but reaching almost to the forehead. (Cf. *Cat. B. Brit. Mus.* XIII, p. 608 note.) (Type from Rustenburg.)

##### c. *Mirafra africana tropicalis* subsp. nov.

Tropical East Africa to Lake districts and Uganda. Size of *M. a. africana*, but the markings bolder, the black centres to the feathers larger and more defined, generally more rufous brown and less ashy.

I am unacquainted with specimens from the West Coast, where *M. africana* is said to occur from Cunene River to Gaboon.

*d. Mirafra africana athi* subsp. nov.

Athi Plain, British East Africa, 24. and 25. 1. 1899. This magnificent form is much more distinct than forms *b* and *c*, and most ornithologists would probably call it a "good species." It differs at a glance from the other forms by its much paler and more greyish general appearance. The wing-coverts are not rufous, but greyish-brown with black ante-apical patches. The feathers of the upperside are black with wide whitish-brown borders, the head much lighter than in the allied forms, the nape not conspicuously rufous, the superciliary stripe almost white and very conspicuous, the throat white, the size perhaps a little smaller; wing in one male 101, in the females 95—96 mm. Under wing-coverts and wing-lining much paler than in the other forms, the under tail-coverts very pale isabelline, nearly white. "Iris orange golden, feet flesh-colour, upper bill dark grey, lower yellowish grey."

A young bird, Nairobi, 31. 1. 1899, evidently belongs to this same form. It is much more blackish, the crown of the head almost black, the feathers of the upperside and wing-coverts are blackish brown with sharply limited whitish edges. The spots on the crop-region are larger than in the adult bird, the rectrices, as usual in young larks, are narrower and somewhat pointed. "The iris was brown, feet light brown."

129. *Mirafra fischeri* (Rehw.)

♂ ad. Kitagwetoa in Torn, 6. 4. 1899. "Iris dark brown, feet pale brown, upper bill dark, lower pale grey." Specimens of this lark are in the Tring Museum now from Ussimbiro, Fadjuli (Emin Pasha coll.), Dar-es-Salaam (collector unknown), Mombasa (Kretschmer coll.), and Samburu, four days from Mombasa (Ansorge coll.).

130. *Mirafra rufocinnamomea* (Salvad.) (an *torrida*?)

♂ ad. Campi-ya-Simba, 11. 1. 1899. "Iris sepia, feet light brown. Upper bill dark grey, lower light grey."

Sharpe has identified Shelley's *Mirafra torrida* from Ugogo with Salvadori's *M. rufocinnamomea* from Abyssinia, and Professor Reichenow has kindly named the specimen in question as *M. rufocinnamomea*, thus evidently agreeing with Dr. Sharpe. It is, of course, quite possible that both forms cannot be separated, but a series from the various places should be compared. As it is, the rufous form before me is apparently only a rufous subspecies of *M. fischeri*, from which it differs only in the very much more rufous colouration everywhere. In the description of the type by Henglin I do not see the cross-markings mentioned which are so characteristic to the upperside of *M. fischeri fischeri* and its rufous subspecies. The latter is probably the desert form. (Uf. P. Z. S. 1882 pl. XVII. (very bad figure), Cat. B. Brit. Mus. XIII. p. 600.)

131. *Mirafra intercedens* Rehw.

Shot at Campi-ya-Simba on the same day as the preceding species, and was therefore on the label marked as the female of the latter. This, however, is erroneous, the two species being perfectly distinct. Colour of iris sepia, feet and bill as in the preceding species.



132. *Tephrocorys cinerea* (Gm.).

I am not a little puzzled by two *males* of a lark shot in the Athi Plain, British East Africa, on January 25th, 1899, and which, as far as I can see, do not differ from South African *T. cinerea*, of which I have a good series to compare. It may be that the patch on the sides of the neck is rather dark. The wings measure 93 and 94 mm.

This species consists, in my opinion, of a number of races, or geographical representatives.\*

*a. Tephrocorys cinerea cinerea* (Gm.).

South Africa. (Two from Athi Plain apparently not separable ! ?) Outer web of two outer rectrices margined with white. Nape not sharply streaked with black.

*b. Tephrocorys cinerea spleniata* (Strickl.)

N. Damaraland to Benguela. Like *a*, but paler.

*c. Tephrocorys cinerea anderssoni* (Tristr.)

Damaraland. Like *a*, but more rufous on the sides, outer web of outermost rectrix fulvescent, that of second not different from the rest.

*d. Tephrocorys cinerea ruficeps* (Rüpp.)

N.E. Africa. Spots on sides of neck blackish, sides and tail as in *c*; nape sharply streaked with black.

133. *Pycnonotus nigricans minor* Hengl.

Kimbugu, Kinyomozzi, Great African Forest, nineteenth day from Fort Béni, 23. 5. 1899, and Bafwazabangi, on the Ituri River, 28. 5. 1899.

134. *Andropadus gracilis* Cab.

♀ Kitima, Government station on the Ituri River, twenty-first day's march from Fort Béni. In the *Cat. B. Brit. Mus.* v. VI, p. 115 this species is placed in *Chlorocichla* in Shelley's list of African birds under *Criniger*. I fail to see generic differences from *Andropadus*, and I doubt the generic distinctness of several of these genera. "Iris red."

135. *Andropadus eugenius* Rehw. (?).

One *male*, shot in Great African Forest on the fifth day's march from Fort Béni, agrees with a specimen from Eldoma Ravine (♀), except that the middle of the abdomen is light yellow, the sides of the throat still more brilliant yellow, the wing a little shorter (83 mm.). The specimen has not the appearance of a young bird, but Dr. Ansorge has marked it: "♂ young. Iris dark grey; feet yellowish-brown; bill dark greenish-brown." More specimens are necessary to decide whether this bird is exactly the same as *A. eugenius* or not.

\* Cf. *Cat. B. Brit. Mus.* X111. p. 561 (Sharpe).

136. *Andropadus virens* (Cass.)

♀. Great African Forest, fifth day's march from Fort Béni, 9. 5. 1899.  
♂. Great African Forest, Kitima, Government station on the Ituri River. "Iris dark grey."

137. *Criniger flavigula* (Cab.)

♂ ♀. Kielnehn in Toru, 5. 4. 1899. ♂. "Iris old gold, feet greenish brown, bill black." ♀. "Iris brown-ochre on inner eirele, grey-brown on outer. Feet greenish-grey; bill blackish." The ♀ is much smaller than the *male*.

138. *Criniger tricolor* (Cass.)

♂. Great African Forest, eleventh day's march from Fort Béni, 15. 5. 1899.  
"Iris ochre-grey."

139. *Xenocichla hypoxantha* Sharpe.

♂ ad. Fort Gerry, Toru, 9. 4. 1899.

140. *Phyllostrephus flaviventris mombasae* Shell.

♂ ad. Makindos River, 4. 11. 1896, agrees fully with typical *mombasae*, except that the wing is slightly longer, measuring 113 mm.

141. *Turdinus albipectus* Rehw.

♂ ♀. Fourth and eighth day in Great African Forest, May 8th and 12th, 1899.  
"Iris ♂ red-brown, ♀ greyish-ochre; feet bluish-grey; upper bill slate-colour, lower pale bluish-grey." ♂ wing 74 mm., ♀ wing 68 mm.

142. *Bradypterus apicalis* (Cab.)

♂ ♂. Kaboa in Uganda, Kikanja in Toru. "Iris pale ochre."

143. *Cisticola rufopileata* Rehw.

♂. Warri, Lower Niger, 11. 10. 1897. "Iris light brown; feet whitish; bill black." (Felix Roth. coll.). This is the bird erroneously called *C. ruficapilla* in *Cat. B.* VII. p. 248. If, however, the rufous outer aspect of the quills is the only difference between *C. cinerascens* and *C. rufopileata*, and their areas are not separate, I cannot help doubting their specific distinctness.

144. *Cisticola chubbi* Sharpe.

♂. Kitagwetoa in Toru, 6. 4. 1899. "Iris pale ochre; feet flesh-colour."

145. *Cisticola cinerascens* Hengl.

Karimia, 1. 5. 1899. "Iris gold-brown; feet pale brown; upper bill dark blackish-grey, lower light grey, darker towards the cutting-edge."

146. *Cisticola strangei* (Fras.)

♂ ad. Galabi in Uganda, Kasesi in Torn, March and April 1899. "Iris ochre."

147. *Cisticola erythrogenys* Rüpp.

Nairobi, January 1899. "Iris reddish brown."

148. *Cisticola hindei* Sharpe.

A series from Nairobi, shot in the last days of January and the first days of February 1899, are much lighter and paler, and the rump and upper tail-coverts are more heavily patched with black, than in *C. cisticola*. They agree fully with the types of *C. hindei*. This form is evidently a light form of *C. cisticola*. The plate of *C. hindei* in the *Ibis* for 1898 does not give an idea of its pale colouration.

149. *Erythropygia hartlaubi* Rehw.

Fort Gerry and Nakabimba in Torn, April 1899. "Iris dark brown; feet slate-grey." The nestling is above deep brown, spotted with pale rufous brown, each feather being pale rufous brown, widely edged with blackish brown.

150. *Euprinodes* (? an potius *Apalis*) *flavocincta* Sharpe.

♀ ad. Nairobi, 5. 2. 1899.

151. *Camaroptera griseoviridis* (v. Müll.)

♂ ad. River Lubilia (one day's march westward from Lake Albert Edward), Ussongora 30. 4. 1899. "Iris of the colour of old gold; feet yellowish-brown; bill dark grey."

152. *Crateropus kirki* Sharpe.

♂♂ ad. Karimia (Ussongora), 1. 5. 1899. "Iris orange-yellow, shading into lemon-yellow towards inner edge; feet steel-grey; bill black."

153. *Crateropus sharpei* Rehw.

♀ ad. Kitagwetoa in Toru, 6. 4. 1899. "Iris: inner circle whitish-yellow, shading into whitish-grey towards the outer circle; feet dark grey with a faint purple tinge; bill black."

154. *Zosterops stuhlmanni* Rehw.

♀♀. Kikanja in Toru, 3. 4. 1899. "Iris pale ochre." These two specimens have been compared by Professor Reichenow with the type of the species.

155. *Nectarinia kilimensis* Shelley.

Kampala in Uganda; Butiti, Lubona, and Kahangi in Toru, March and April 1899. "Iris dark brown; bill and feet black." *N. filiola* Hartl. is the same. The supposed more reddish shcen of one of these supposed forms is quite variable. Specimens of *N. kilimensis* in the British Museum and some named for me by Reichenow, do not differ from the typical series of *N. filiola* collected by Emin Pasha.

156. *Cinnyris erythroceria* (Hartl.).

Fort George and Fort Gerry, in Toru. "Iris dark brown." Adult males with central rectrices fully 20 mm. longer.

157. *Cinnyris cuprea* (Shaw).

Kawelli and Mubende in Buekulla; Galabi in Singo, Uganda. "Iris dark brown."

158. *Cinnyris verticalis viridisplendens* Rehw.

Kaboa (Buekulla), 1. 4. 1899, Fort Gerry, Toru. 9. 4. 1899. The female has the wing 7 mm. shorter than the adult male.

159. *Cinnyris eboensis* (Jard.).

1343, *Nectarinia eboensis*, Jardine, in *Naturalists' Library*, v. xvi. *Sunbirds*, p. 244; *ibidem* pl. 30 and p. 25 f. under the name of *N. adelberti*; 1889, *Cinnyris castaneiventris*, Madarasz in *Ornis* v. V. p. 149, pl.

The *male* differs from *C. adelberti* as follows: The wing-coverts are uniform deep olive-brown, not rufous fawn-colour; the abdomen is chocolate-brown or very nearly "burnt umber," not chestnut. The hindneck and back are not so black; the throat is paler; the crown is of a slightly more bluish, not so yellowish green.

The type of *Nectarinia eboensis* is still in the British Museum, where it was apparently not noticed by the author of vol. IX. of the *Cat. B. Brit. Mus.* This is the sole representative of the species in the British Museum. A friend of mine suggested (in litt.) that both *C. adelberti* and *C. eboensis* might have been found by Shelley on the Gold Coast, as that ornithologist mentions specimens with light and dark wings; but I have examined these specimens and found them all to be typical *C. adelberti* in more or less faded and worn plumage. We have thus two species of subspecies: *C. adelberti* from the Gambia to the Gold Coast, *C. eboensis* from the Niger to the Congo. I have examined forty specimens of *C. adelberti* and seven of *C. eboensis*, sent by Dr. Felix Roth from Warri in the Niger Coast Protectorate, while Prof. Reichenow tells me that he has it from the Congo. It is strange that Dr. von Madarasz redescribed *C. eboensis*, without even referring to the name *eboensis*.

160. *Cinnyris acik aequatorialis* Rehw.

According to the measurements given by Reichenow (in *Orn. Monber.* 1899 p. 171) the specimens from Kitagwetoa (Toru), Butiti (Toru), Fort George (Toru), Kahangi (Toru), and those recorded from Masindi, in Unyoro, in Ansorge's *Under the African Sun* p. 351, would all belong to the subspecies which he describes as a species (!) from Bukoba and the Sesse Islands. This form cannot be considered to be more than a subspecies, the differences in the size of the wings, tail and bill not amounting to more than 3 or 4 mm., and other differences not being apparent, and the two forms replacing each other.

On the same page (171) Prof. Reichenow also separates the southern (larger)

\* It is curious that this work, which should be correctly quoted as above, is persistently quoted as *Monograph of Sunbirds*, a title which does not exist.

and the northern (smaller—East African) forms of *C. gutturalis*, calling that from East Africa *C. gutturalis*, that from Damaraland *C. gutturalis damarensis*. The difference in the size of these two forms is apparently larger than that of *C. acik acik* and *C. a. aequatorialis*, the wing being 75—58 in the southern, 71—72 in the northern form. Prof. Reichenow's name *damarensis*, however, cannot be used, as I have already (Ansorge's *Under the Afr. Sun* p. 351) named the East African small form *C. gutturalis inaeestimata*, restricting the name *gutturalis* to the large southern form. As Linnaeus did not give the exact locality, his species being taken from Brisson's *Grimpereau noirastre de Brésil*, and this name being afterwards used for southern birds, I, as the first author, who discussed the forms, had the right to restrict the first name *gutturalis* to any one of them, and it seemed to me more natural to apply it to the southern larger form.

A third closely allied form is *C. gutt. saturator* Rehw. from Angola.

#### 161. *Cinnyris chloropygia orphogaster* Rehw.

♂ ad. Mohalla and Kitima, Great African Forest, on the Ituri River, 12th and 21st day from Fort Béni.

In no. 12 of vol. VII (1899) *Orn. Monber*. Prof. Reichenow has published the results of a careful study of the forms of *Cinnyris chloropygia* auct., as far as material was available to him. Mr. Rothschild and I have gone over the series in the Tring Museum, and we found that it fully bears out the conclusions arrived at by Prof. Reichenow. We have the following specimens of the three forms recognized by Prof. Reichenow.

##### *a. Cinnyris chloropygia chloropygia* Jard.

Liberia (Robertsport), Demery coll., 3 ♂, 3 ♀; Warri in the Niger Coast Protectorate, Felix Roth coll., 5 ♂, 3 ♀; Sierra Leone (Clements and Hogg coll.), 3 ♂. Reichenow says: Gold Coast, Niger.

##### *b. Cinnyris chloropygia orphogaster* Rehw.

Djanda and Uvamba (Emin Pasha coll.), 2 ♂; Ituri River (Ansorge coll.), 2 ♂. Reichenow says: Mittel-Africa (Bukoba, Soweh I., Sesse Is., Sotik). (The Kitima specimen seems to approach *C. c. lühderi* a little.)

##### *c. Cinnyris chloropygia lühderi* Rehw.

Léopoldville and Stanley Falls, Congo (Bohndorff coll.); Arawimi River (Camp of Rear-Column), Bonny coll. Reichenow says: Kamerun, Gabun, Loango.

The differences stated by Reichenow are easily recognizable, especially the typical form with its very short wing and pale abdomen is very distinct. There is, however, a mistake in Reichenow's "key," the measurements of the two groups under no. 2 being given as over 50 and under 50 mm., while it should clearly be—as evident from the measurements given under no. 3—over and under 56 or 60 mm.

#### 162. *Parus niger* Bonn. & Vieill.

Karimia, 1. 5. 1899. "Iris dark brown."



163. *Cossypha heuglini* Hartl.

♂ ad. Kitagwetoa in Torn, 6. 4. 1899. "Iris chocolate-brown. Feet purplish brown. Bill black." This specimen has a white frontal band of 3 to 4 mm. I have not found this in any specimen in Tring and London.

164. *Cossypha subrufescens* Boc.

Nairobi, 5. 2. 1899. "Iris dark brown, feet and bill black." I follow Sharpe, Reichenow, and Shelley in identifying the East African birds with *C. subrufescens* of Bocage, but I have not been able to compare specimens.

165. *Myrmecocichla nigra* (Vieill.)

♂ ad. Kichuchu in Torn, 5. 4. 1899. "Iris dark brown." The birds without white on throat and crown—black all over with only a large white shoulder-patch—must be called by Vieillot's name *nigra*, based on Levaillant's Traquet Commandant. *M. arnotti* is a totally different species.

Professor Reichenow considers the totally blackish birds without white shoulder-patch also to be *M. nigra*. We have got some from Uganda and Karimia. If they really are *M. nigra*, then it is curious that they are all brownish, not pure black, while those with the white shoulders are all deep glossy black. The latter are in fresh plumage, while the brown ones—although shot in the same month—are worn, but it is strange that this state of plumage is the same in all of them, and that in our good series there are no transitional examples.

166. *Myrmecocichla cryptoleuca* Sharpe.

♂♂ Nairobi, 1. 2. 1899. "Iris brown."

167. *Myrmecocichla subrufipennis* Rehw.

♂ ad. Kinyomozi in Torn, 4. 4. 1899. "Iris brown. Bill and feet black."

168. *Saxicola pleschanka* (Lepech.)

Nairobi, 27, 29, 30. 1. 1899.

169. *Saxicola isabellina* Cretzschm.

Nairobi, 29. 1. 1899. Campi-ya-Simba, 11. 1. 1899.

170. *Pratincola rubetra* (L.)

Uganda Proper, March 1899.

171. *Pratincola axillaris* Shelley.

From Kiwalogoma (Chagwe), Lake Varangot in Torn, and Fort Gerry in Torn, we have received specimens which fully agree with the typical series of *Pratincola emmae* Hartlaub, but Professor Reichenow unites *P. axillaris* and *P. emmae*.

172. *Turdus pelios saturatus* (Cab.)

Saint Emma (Basiro) in Uganda, 23. 3. 1899; Kabangi and Butiti in Toru, 7 and 8. 4. 1899; Fort George on Lake Albert Edward, 29. 4. 1899.

I believe that these four Thrushes are *saturatus*, and that also the specimens from Unyoro which I recorded as *Turdus bocagei* in the Appendix to Ansorge's "Under the African Sun," p. 354, belong to *saturatus*. They seem to differ very little from typical *T. pelios* from North-East Africa, but the wings are said to be shorter, and it seems that the rust-colour on the sides is less extended, while the chest and upperside are equally dark or darker. If this form is separable it can only stand as a subspecies. We have thus :—

1. *Turdus pelios pelios*. Large, with much rust-colour on the sides, brownish chest; N.E. Africa.

2. *T. pelios saturatus* (Cab.) A little smaller, the rust-colour less extended, at least as dark or darker above and on the chest; W. African forest-region to Uganda.

3. *T. pelios chiquancoides* Seeb. Without or with very little rust-colour on the sides, chest paler. Senegambia, probably to Niger district, but birds from there are perhaps slightly intermediate.

4. *T. pelios bocagei* (Cab.). A little larger than 2 and 3, as large as 1, chest more or less rufous. Angola (cf. *Cab. J. f. O.* 1882 p. 320, Sharpe in Seeböhm's *Monagr. Turdidae*, part VII.).

A series of Thrushes of this group in the Tring Museum from Grand Cape Mount, Liberia, labelled by Dr. Büttikofer, differ remarkably in their deep colouration and a very different rufous rust-colour under the wings. No one would hesitate to separate this form (which by the extent of rust-colour is clearly *chiquancoides*), on account of its singular colouration as a new subspecies, if it was not for the fact that they have been in spirits and are skinned in Leyden. No remark to this effect, however, is on the labels! Unfortunately many hundreds of such skins which have been in spirits have been sold to various Museums in Europe, where they were accepted in good faith, without an idea that they had been in alcohol. **The greatest caution must therefore be used with regard to all Liberian skins in judging their colour**, and it is to be feared that *Xenocichla harterti* Reichenow (Nov. Zool. 1895, p. 60) is the first and probably not the last mistake which resulted from such specimens. It is well that every ornithologist should be aware of the history of these Liberian skins.

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## THE LEPIDOPTERA OF BURU.

## PART I.—RHOPALOCERA.

BY W. J. HOLLAND, Ph.D., LL.D., F.Z.S., F.E.S., ETC.,

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THE island of Buru (Bourou, Bouro, Boeroe) is situated approximately in lat.  $3^{\circ} 18'$  to  $3^{\circ} 50'$  S. and long.  $126^{\circ}$  to  $127^{\circ} 15'$  E., reckoned from Greenwich. According to von Carrière it has an area of 3487 square miles, covering therefore an area about three-fourths the size of the state of Connecticut. It belongs to the Dutch Residency of Amboyna, and is divided into twelve regencies subject to the general control of a deputy appointed by the Resident of Amboyna. The deputy has his residence at Cajeli (=Kajeli = Kayeli) on the eastern coast. The port of Cajeli in 1854 was declared free to the ships of all nations.

The island is mountainous in the interior, the highest peak, Tomahoe, rising to an elevation of 8529 feet above the level of the sea. The seaboard districts are alluvial and marshy in many parts. The island is traversed by a multitude of small streams, having a short but rapid course from the interior to the sea, very few of them being worthy of being designated as rivers, except the Cajeli, or Wai Apoe, which is navigable for a short distance. In the western portion of the island is a large sheet of water, Lake Wakoholo, with a circumference of thirty-seven miles and a width of two miles, which appears to occupy the crater of an extinct volcano, at an elevation of 1900 feet above sea level. Much of the island is covered with scattering forests, and the lowlands with tall marsh grasses. The soil where cleared is fertile. Coffee and cacao are extensively cultivated. Tropical fruits abound. The principal article of export is cajeput oil, distilled from the leaves of *Melaleuca cajuputi*, which is extensively used as a panacea throughout the lands of the Malays, and possesses value as an anti-spasmodic and sudorific, and is reputed to be a specific in rheumatic affections, when applied externally.

The flora of the island is very rich. The mammalian fauna is not extensive, but interesting. The avifauna, on the other hand, is of considerable extent, and includes a number of species peculiar to the island. The natural history of Buru has received attention from a number of travellers and explorers; Forbes and Wallace being the only ones who have written at any great length upon the subject. Very little has been written upon the *Lepidoptera*. Boisduval in the *Voyage de L'Astrolabe* mentions a number of species found upon the island. Wallace in several papers describes species of his collecting as new to science, and in the papers of a number of other authors there are occasional references to species found here. The entire literature of the subject does not, however, furnish a hundred references to species distinctly known to belong to the fauna of Buru. Mr. Wallace apparently did not do very well in his collecting upon the island except among the Pieridae, Kühn failed almost entirely, and Forbes did not accomplish much. It was left to Mr. William Doherty, the intrepid naturalist explorer of the Malay Archipelago, to make the first considerable collection which has ever been made upon the island. Upon this collection, which was gathered in December of 1891 and January of 1892, the following paper is based.

With the exception of the *Tortricidae*, *Tineidae*, and *Pterophoridae*, which were sent to Lord Walsingham, the entire collection made at this time came into my possession. At intervals of leisure I have devoted to it my best efforts, and think that I have succeeded in working it out with reasonable certainty. I am especially indebted to Sir George F. Hampson for invaluable assistance rendered me in the determination of the moths, which formed a very large part of the collection.

A letter sent me by Mr. Doherty at the time he sent me the collection contains some facts which are of interest in regard to localities on the island, which he visited. He says: "Burn is assuredly a hard nut to crack. . . . Kajeli, the chief port, is a hopeless place for insects. I collected a little at Labuan Barat, not far from Wallace's place, Waiputi. But most of my work was done much farther on, on both sides of Cape Saruma, the south-eastern point of the island, at Ilat (especially), Kusu-Kusu, Poli, and Wailawa. We collected up to about 2000 feet on Mount Lumara, at the back of Ilat. From Kajeli to Ilat, my headquarters, it is two nights by 'prau.' We spent the intervening day at Labuan Barat. The weather was stormy, and the voyage most dangerous and exhausting: otherwise we had a rather pleasant though fatiguing time, and did not lose a single day's collecting. Our health was good during the whole time. The great objection to this coast is that it is all high virgin forest, wholly without paths. Pieridae are therefore scarce. The long walks were very hard on us. Generally in the morning we plodded through the loose sand of the beach, jumping the streams, till we came to some big one which we ascended for miles (each taking his own). It rained every day at 2 p.m., so that in coming back the streams were generally in flood, and we had to cross them waist-deep. Then the tide would probably be up, and we would have to walk long distances in the water. On the whole, I think, putting moths against butterflies, we did about as well as we could have in the dry season. I doubt whether any locality in Burn is better than Ilat, except the Wakoholo country, which is practically inaccessible, except for a few days' trip in light marching order, on account of the want of coolies. The people of the country I visited are Alfuros—beathen, very friendly, honest folk. They came down to the coast only a generation ago, and the interior is now quite uninhabited except at Wakoholo and on the Waijafu River (where there is absolutely no forest). At the back of Ilat is Mount Lumara, some six thousand feet high, covered with unbroken forests. Over much of this country there are island-like masses, ridges of metamorphic limestone, pierced by thousand of caves, much as in Timor or the Malay Peninsula. Apart from this the usual surface rock is micaceous sandstone, overlaying great beds of true mica-schist exactly like that in the Alps. There is coal in the west, and Mount Tomahoe is said to be volcanic." . . . "The moths were all taken by beating, or at light. Baits failed. When you think that Dr. Platen only got eighty odd species in fourteen months in Palawan, Ribbe and Kühn one hundred and fifty in Aru in twelve months, and Ribbe eighty odd in Ceram in over four months, you can see that I am sending you something quite out of the common order."

It remains to be said that the species taken by Mr. Doherty reveal a very close affinity between the fauna of Burn and Amboyna. In the determination of species much assistance has therefore been derived from the very thorough and important papers which have appeared from time to time upon the lepidoptera of the latter island from the pen of Dr. Arnold Pagenstecher, and also from the various papers of the distinguished Dutch naturalist, P. C. T. Snellen of Rotterdam.

RHOPALOCERA.

FAMILY NYMPHALIDAE Swainson.

SUBFAMILY DANAINAE Bates.

GENUS HESTIA Hübner.

1. *Hestia aza* (Boisduval), *Voyage de L'Astrolabe*, *Lepidoptera* p. 106 (1832).

The collection contains a very large series of this species, represented by both sexes.

GENUS RADENA Moore.

2. *Radena buruensis* sp. nov.

This species is very closely allied to *R. luzonica* Moore, but may be at once distinguished from it by the prevalently small size of the light spots upon the wings and the consequent enlargement of the black areas in the discal and outer marginal areas of both the primaries and the secondaries. Compared with a series of *R. luzonica*, this feature is well marked and constant, and permits of an instant discrimination of the two forms.

The collection contains a series of fifteen examples, which show almost no variation whatever in the markings.

GENUS TIRUMALA Moore.

3. *Tirumala hamata* (Macleay), in King's *Australia* II. p. 461 (1827) : Moore, *Proc. Zool. Soc. Lond.* p. 232 (1883).

This species is represented by three *males*.

GENUS NASUMA Moore.

4. *Nasuma ismare* (Cramer), *Pap. Exot.* III. t. 279. f. E. F (1782) ; Moore, *Proc. Zool. Soc. Lond.* p. 233 (1883).

Mr. Doherty captured two *males* and two *females* of this species during his stay on the island.

GENUS ANOSIA Hübner.

5. *Anosia plexippus* (L.), *Syst. Nat.* ed. X. p. 471 (1758).

(For synonymy see Moore, *Monograph of Limnaina and Euploeina*, *Proc. Zool. Soc. Lond.* (1883), and Scudder, *Butterflies of New England*.)

The collection contains several specimens of this species in nowise differing from examples captured during the past autumn in Pennsylvania. The tendency to melanism shown in the form *erippus*, which is commonly received from the tropical portions of the American Continent, is not displayed by these specimens. They are bright in colour, like the form prevalent in the United States, and this is also true of specimens which I have received from other islands of the Eastern Archipelago and from Australia, in which the species has only recently become domiciled. This fact seems to point to the introduction of the species into the



oriental fauna by a process of emigration proceeding from the more northern portions of the American Continent. If the tendency to melanism, which is so apparent in the great majority of South American specimens, is due to climatic and specifically thermal influences, as is probable, the conformity of the specimens from the hot tropical regions of the Australian and Indo-malayan regions to the nearctic type reveals that a sufficient length of time has not yet elapsed to bring about the dusky colouration found in specimens coming from the tropical regions of the New World.

GENUS LIMNAS Hübner.

6. *Limnas petilia* (Stoll), Cramer, *Pap. Exot. Suppl.* t. 28. f. 3 (1790); Moore, *Proc. Zool. Soc. Lond.* p. 239 (1883).

Only two specimens of this species are contained in the collection.

GENUS SALATURA Moore.

7. *Salatura philene* (Cramer), *Pap. Exot.* IV. t. 375. f. A. B (1782); Moore, *Proc. Zool. Soc. Lond.* p. 242 (1883).

One *male* and two *females*.

GENUS RAVADEBA Moore.

8. *Ravadeba lutescens* (Butler), *Proc. Zool. Soc. Lond.* p. 172. f. 3 (1866); Moore, *Proc. Zool. Soc. Lond.* p. 245 (1883).

The species seems to be very common, and I received an enormous series. There is considerable variation in the extent of the light spots in the cell of the primaries, and in some specimens they tend to obsolescence. This is especially true of the *males*, but less so in the case of the *females*. The light colour of the upper surface of the wings is not so bright a yellow as is found in specimens from Batchian contained in my collection.

GENUS VADEBRA Moore.

9. *V. dohertyi* sp. nov.

♂. The wings on the upperside are deep black shading on the outer margins into warm brown, more particularly upon the secondaries. On the underside the wings are paler, the dark tint being almost wholly confined to the region of the cell, and the primaries on the inner margin being pale testaceous, or even white. The primaries are marked by four spots: one in the cell near its end, one just beyond the cell between the third median and the radial nervules, and two below this in the inner end of the interspaces on either side of the second median nervule. Of these three spots thus located beyond the end of the cell the lower one is oblong and the largest of the series. They are bluish white in colour. The secondaries have a small roundish spot at the end of the cell, and just beyond the end of the cell a curved series of five or six oblong spots in the interspaces. There is a double marginal row of spots extending from the outer angle toward the inner angle, which they do not however reach, generally terminating before the first median nervule. The outermost series of these spots shows a marked tendency to obsolescence, and in some specimens is entirely wanting.

♀. The *female* is like the *male* in colour upon the upperside, except that the light colour of the outer margins invades the inner surface of the wing to a greater depth. The primaries on the underside are marked as in the *male*, but the spots are generally a little larger, and there are two white linear streaks near the inner margin, below the first median nervule. The secondaries have the same spots as in the *male*, but the two submarginal series of spots in many specimens are either partially or now and then wholly obliterated. The discal spots are always found, though sometimes they are quite small, and at other times abnormally large.

Expanse : ♂ and ♀ 75 to 85 mm. Described from 29 ♂♂ and 17 ♀♀.

This insect has occasioned me not a little difficulty, as I naturally am reluctant to add another to the list of species in this group. At first I was inclined to identify it with *Euploea lapeyrousei* Boisd., one or two of the *females* in my possession tallying exactly with the description given by Boisduval in the *Voyage de L'Astrolabe*. I then discovered that Mr. Moore has referred *E. lapeyrousei* to his genus *Chirosa*, one of the characters of which is a broad sericeous band on the upperside of the primaries, and states explicitly that "the type specimen of this species is much like *C. pierreti*, excepting that the sericeous streak is narrower and longer." As the insect before me is without the sexual brand on the primaries, it cannot be therefore identified as the insect described by Boisduval, whose types, now in the possession of Mons. Charles Oberthür, were consulted by both Dr. Butler and Dr. Moore in their preparation of their monographs of the *Euplocinæ*. Accepting the entire accuracy of the figure of *Vadebra melina* given by Dr. Butler in the *Proc. Zool. Soc. Lond.* 1866, p. 282, the insect before me cannot be well referred to this species, although Dr. Boisduval states that *E. melina* occurs in Burn. I likewise cannot bring myself to refer the form before me to the species named and figured as *Euploea elimena* by Cramer, and made the type of the genus *Vadebra* by Moore. While the Cramerian figures are none of the best, there is too great a discrepancy between the figure and the insects under consideration to permit me to assume their identity. I have therefore ventured to name the butterfly after its discoverer.

#### GENUS GAMATOBA Moore.

10. *G. spiculifera* Moore, *Proc. Zool. Soc. Lond.* p. 263 (1883).

The collection contains a small series of this fine species.

#### GENUS BETANGA Moore.

11. (?) *B. duponcheli* (Boisd.), *Voy. Astrol., Lep.* p. 97 (1832).

This is another case in which the exceedingly brief description given by Boisduval leaves us in doubt. Mons. Oberthür, in his *Lépidoptères Océaniens*, p. 35, intimates that the insect ticketed as *Euploea duponcheli* by Dr. Boisduval, and standing in his collection, does not agree at all with the published description. He assumes that the insect labelled in the British Museum as *E. duponcheli* is correctly determined. Boisduval gives Burn as the habitat of the insect. I have before me about eighty specimens evidently belonging to the same species, *males* and *females*. Among the *females* I find several which agree very well with Boisduval's description except in one particular, which I shall point out presently.

The description given in the *Voyage de L'Astrolabe* is as follows: "Ailes d'un brun noir, plus pâle à l'extrémité, sans taches; dessous des quatres avec deux rangs de points marginaux violâtres; les supérieures ayant en outre quatre points, et les inférieures six points discoidaux violâtres. Elle se trouve à Bonron." The point of discrepancy which most puzzles me is found in the entire absence on the underside of the primaries of all my specimens, both *male* and *female*, of the outermost row of marginal spots (*points marginaux*). They are found on the secondaries according to the description above cited, but not on the primaries, where there is but one row, with only a faint suggestion in one or two specimens of the outer or strictly marginal series. Beginning with specimens which thus accord in the main with the description of Dr. Boisduval, I am able to trace a series of forms regularly intergrading until I arrive at forms in which the description given by Boisduval does not at all apply. The maculation of the underside of the wings advances step by step until we have specimens the undersides of the wings of which are covered with small white spots arranged as follows: On the primaries near the outer angle a few marginal spots, a submarginal series of spots extending from the first median interspace to the costa, three spots before the end of the cell at the inner end of the interspaces, the lowermost spot large and oblong, a round spot in the cell near its end, and a moderately large costal spot beyond the middle of the costa. On the secondaries there are three curved series of spots, a marginal and submarginal not reaching the inner angle, and a curved series of seven discal spots just beyond the cell, one on each interspace from vein 1 to vein 8, a roundish spot in the cell at its extremity, and four or five minute white spots at the base of the wing. These spots also reappear more or less (especially those of the submarginal series) upon the upperside of the wing, and thus nullify the words of Dr. Boisduval's description, which declares that the upper surface is devoid of markings. In spite of these numerous and apparently great discrepancies between the description and some of the specimens, I am inclined to think that I am right in identifying the forms before me as belonging to *B. duponcheli*. At all events no other species from Buru seems to accord more nearly with Boisduval's description.

#### GENUS EUPLOEA Fabricius.

##### 12. *E. semicirculus* Butler, *Proc. Zool. Soc. Lond.* p. 269 (1866).

There is a small series of this species in which the specimens are considerably larger than specimens I have received from Batchian through Dr. Standinger, and in which the submarginal blue spots are considerably larger and more conspicuous. Otherwise there is no difference, and the insects agree well with the figures and descriptions which have been given.

#### GENUS CALLIPLOEA Butler.

##### 13. *C. infantilis* Butler, *Proc. Zool. Soc. Lond.* p. 766. t. 77. f. 3 (1876).

There is one male specimen of this species which was originally described from New Guinea. It does not differ from specimens received by me from Batchian, except that the spots on the underside of the wings are a trifle smaller.

## GENUS SALPINX Hübner.

14. *S. bouruana* Moore, *Proc. Zool. Soc. Lond.* p. 302 (1883).

This is the local race of *S. nemertes* Hübner, which is apparently not at all uncommon upon the island. There is a large series of specimens, both *male* and *female*, in which there is great diversity in size as well as in maculation. Some small *males*, apparently starvelings, are one-third smaller than others. Some of the *females* also greatly exceed others in expanse of wing. The submarginal spots on the upperside of the wing, and the conspicuous blue spot between veins 1 and 2 on the primaries, vary very much in some specimens, revealing a strong tendency to become suffused with white and to spread.

## GENUS STICTOPLOEA Butler.

15. *S. watsoni* Moore, *Proc. Zool. Soc. Lond.* p. 322 (1883).

There is a small series of this fine insect. The *female* is much like the *male* in her markings, only varying structurally.

## GENUS HAMADRYAS Boisduval.

16. *Hamadryas assarica* (Cramer), *Pap. Erot.* IV. t. 363. f. A. B (1781).  
Moore, *Proc. Zool. Soc. Lond.* p. 256 (1883).

Moore in his monographic revision of the *Enploeina*, which is cited above, states distinctly that this genus is without a "sexual mark," or scent-producing organ on the forewing of the male. With this I am compelled to disagree. In the species before me, and in fact in all the other species accessible to me in my collection, *H. zoilus* (Fabr.), *H. aequirincta* Salv. & Godm., and *H. nedusia* (Hübner), the males are characterized by the presence on the inner half of the wing of a large tract of a modified scales, having well-defined limits and visible to the naked eye as lighter-coloured areas. These patches of modified scales extend from the inner margin to below the cell, and outwardly towards the external margin, which they never, however, reach. Under the microscope these tracts reveal that the scales upon them are elongated, and differ from the scales upon the rest of the wing, which are prevalently more or less orbicular. The figure given by Cramer of this species is undoubtedly that of a *female*. The *males* are not only characterized, as I have just pointed out, by the broad patch of androconia on the primaries, but by the much smaller size of the subapical spot on the primaries, which is not simply less in area than in the case of the female, but tends to translucency, giving the wing a duller colour than is the case in the opposite sex, in which the clear white contrasts boldly with the deep black of the rest of the surface.

The collection contains a large series of specimens, for the most part in good condition.

"*Hamadryas* turned out to be an *Ichomiid*, as I expected."—Doherty *in litt.*

## SUBFAMILY SATYRINAE Bates.

## GENUS LETHE Hübner.

17. *L. europa arete* (Cramer), *Pap. Ex.* IV. t. 313. f. E. F (1782).

This collection contains several *males* and one damaged *female*.



## GENUS MELANITIS Fabricius.

18. *M. leda bouruana* subsp. nov.

The specimens of this species which lie before me are remarkable on account of the very red cast of the upper surface of the wings in the *male*, and the wide expanse of the yellow apical tract in the *female* sex. The outer margin of the primaries in the case of the *male* is also peculiar on account of the entire obsolescence of the subapical tooth-like projection, which is only discernible in one specimen as a very slight outward bend in the otherwise straight margin. Mr. Doherty tells me in his letters that this form extends to Timor and Flores. He is inclined to think it a distinct species. It is at all events fairly entitled to a subspecific name, and the brief notes I have given will easily, I think, enable students to discriminate it. Both the *males* and the *females* are highly fragrant, when first taken.

19. *M. constantia* (Cramer), *Pap. Ec.* II. t. 133. f. A. B (1779).

The figure given by Cramer is that of a *female* specimen. The *males* exist in numerous varietal forms, characterized by the greater or less prominence of the broad yellow subapical band, which in occasional specimens is almost obliterated. The subapical ocelli are also very variable in size, and tend to become obsolete. In one large *female* in the collection they have been replaced by small white points on the unusually broad yellow subapical band. This species, like the preceding, is very fragrant.

20. *M. amabilis* (Boisduval), *Voyage de L'Astrolabe*, *Lep.* p. 140. t. 2. f. 1. 2 (1832).

There is a good set of this species. The figure given by Boisduval is that of a *female*, in which the subapical band is white. It is yellow in the case of the *males*. Boisduval's figure is also too small, apparently representing a dwarfed specimen. The examples in the collection before me are likewise redder upon the upper surface than represented in the plate in the *Voyage de L'Astrolabe*.

21. *M. ribbei* Standinger, *Iris* I. p. 192. f. 1. 2 (1887).

There are a few very large *males* of this species, which is probably merely a variety of *M. relutina* Felder, characterized by its larger size, and the darker upper surface of the wings, which in the examples before me are black.

## GENUS MYCALESIS Hübner.

22. *M. perseus* (Fabricius), *Syst. Ent.* p. 488 (1775).

Only a single specimen of this widely distributed species was contained in the collection.

23. *M. medus* (Fabricius), *Syst. Ent.* p. 488 (1775).

There are four specimens of this species in the collection.



24. **M. remulia** (Cramer), *Pap. Ex.* III. t. 237. f. F. G (1782).

Numerous examples.

25. **M. sirius** (Fabricius), *Lc.*

*Satyrum manipa* Boisd., *Voy. Astrol., Lep.* p. 150 (1832).

A good series of this species, including two *females*, which are much larger and brighter in colour than the *males*, and in which the ocelli are also larger and much more distinct.

SUBFAMILY ELYMNIINAE Herr.-Schäff.

GENUS ELYMNIAS Hübnér.

26. **E. viminalis** Wallace, *Trans. Ent. Soc. Lond.* p. 328 (1869).

The specimens which I refer to the species named as above by Mr. Wallace agree quite well with his description, if based upon a *female* type. The luteous band on the margins of the wings, of which he speaks in *loc. cit.*, are conspicuous features in that sex, but not so much so in the case of the *male*, which is prevalently much darker than the *female*. The maculation on the underside of the wings is much less than in the case of *E. vitellia* (Cramer), and is almost wholly restricted in the case of the *males* to the spots at the ends of the cell on both wings, and the curved discal series of spots, which succeed these.

There are a number of *males* and several *females* in the collection.

SUBFAMILY MORPHINAE Butler.

GENUS TENARIS Hübnér.

27. **T. urania** (Linnaeus), *Mus. Lud. Ulr.* p. 225 (1764).

There are a few poor *males* and one torn *female* belonging to this species.

28. **T. buruensis** Forbes, *A Naturalist's Wanderings in the Eastern Archipelago* p. 411 (1883).

There are a number of this species, mostly *females*, in the collection. The description given by Forbes applies to the *female*, and apparently was founded upon a specimen of that sex. The *males* have narrow wings, prevalently light fawn-colour.

SUBFAMILY NYMPHALINAE Bates.

GENUS CETHOSIA Fabricius.

29. **C. cydippe** (Linnaeus), *Syst. Nat.* I. 2. p. 776 (1767).

*Papilio ino* Cramer, *Pap. Ex.* I. t. 62. f. A. B (1779).

Apparently not very common. The specimens show a tendency to melanism, and agree in this more nearly with the figure given by Cramer than with that given by Clerck.

30. *C. buruana* sp. nov.

This is the form of *C. biblis* which appears to predominate on the island of Buru. It is characterized by a marked tendency to melanism. In the *male* sex the red on the upperside of the primaries is restricted to a semicircular tract on the inner margin of the wing reaching very little if at all above the first median nervule just at its origin. The marginal, submarginal and discal lunules are almost suppressed in the majority of specimens, with the single exception of the white hastate spot between the second and third median nervules, which in all specimens is large and distinct, standing out conspicuously upon the darker ground surrounding it. The upperside of the secondaries is brighter red than the primaries. The margin is broadly black, the interspaces being adorned with the usual marginal lunules. Just after the broad black margin there is a narrow dark submarginal line. The red area of the primaries is marked by three black spots, two on the first and one on the second median interspace. The underside is much as in *C. biblis* (Drury). The *females* are darker and larger than the *males*, the red tint of the upperside of the wings being replaced in this sex by a dark shade of olivaceous brown, having a very distinct greenish cast in certain lights.

The species seems to be quite constant, and is easily discriminated by its facies from other allied forms. Inasmuch as a specific name has been given to insular varieties of this insect from numerous other localities, it has appeared to me that this form is well worthy of being treated in like manner.

The collection contains a couple of *males* and several *females*, the latter mostly in poor condition.

## GENUS CYNTHIA Fabricius.

31. *C. deione* Erichson, *Nov. Act. Ac. Nat. Cur.* XVI. Suppl. t. 50.  
f. 2. 2A (1833).

A large number of specimens, mostly *males*.

## GENUS MESSARAS Doubleday.

32. *M. lampetia* (Linnaeus), *Mus. Lud. Ulr.* p. 286 (1764).

A large series of specimens showing great variability in size, some examples being only half as great in expanse of wing as others.

## GENUS ATELLA Doubleday.

33. *A. egista* (Cramer), *Pap. Ec.* III. t. 251. f. C. D (1782).

Apparently quite common.

## GENUS SYMBRENTHIA Hübner.

34. *S. hippoclus* (Cramer), *Pap. Ec.* III. t. 220. f. C. D (1782).

Only a couple of worn specimens.

GENUS JUNONIA Hübner.

35. **J. erigone** (Cramer), *Pap. Ex.* I. t. 62. f. E. F (1779).

A few good examples.

36. **J. atlites** (Linnaeus), *Amoen. Acad.* VI. p. 407. n. 72 (1764).

Two specimens.

GENUS PRECIS Hübner.

37. **P. hellanis** Felder, *Reise Nov., Lep.* III. p. 402 (1867).

A good series.

GENUS YOMA Doherty.

38. **Y. sabina** (Cramer), *Pap. Ex.* IV. t. 289. f. A—D (1782).

A large series of specimens, varying as usual.

GENUS DOLESCHALLIA Felder.

39. **D. bisaltide** (Cramer), *Pap. Ex.* II. t. 102. f. C. D (1779).

A couple of specimens in poor case.

40. **D. melana** Staudinger, *Exot. Schmett.* I. p. 104 (1888).

This is a very true species. The *female* is somewhat larger than the *male*, and the line of demarcation between the red basal portion of the primaries and the dark outer part of these wings is in this sex not quite as sharply defined as in the *male*, in which the dividing line is quite straight, as is pointed out by Staudinger in his description. The species is most nearly allied to *D. sciron* Salv. & Godm., but is abundantly distinct.

There is a small suite of specimens contained in the collection.

GENUS CYRESTIS Boisduval.

41. **C. thyonneus** (Cramer), *Pap. Ex.* III. t. 220. f. E. F (1782).

This species appears to be exceedingly common.

42. **C. paulinus** Felder, *Wien Ent. Mon.* IV. p. 247 (1860).

Only one specimen turned up.

GENUS HYPOLIMNAS Hübner.

43. **H. bolina** (Linnaeus), *Mus. Lud. Ulv.* p. 295 (1764).

The collection contains a good series of *males* and two rather poor *females* of the form named *iphigenia* by Cramer (*Pap. Ex.* t. I. 67. f. D. E). De Nicéville, in his synonymy of the species, does not quote this reference to Cramer among the known synonyms, though it is properly cited by Kirby, immediately after the citation of the following species, which, however, I cannot bring myself to regard as properly placed in the synonymy of *H. bolina*.

44. **H. lasinassa** (Cramer), *Pap. Er.* III. t. 205. f. A. B (1782).

There is a set of *males* and *females* of this species, which, when compared with the large series of *H. bolina* captured at the same time and in the same locality, leads me to disagree with the view of Kirby, that *H. lasinassa* is a mere synonym for *H. bolina*. In the first place the *male*, which superficially resembles *bolina*, differs widely from any specimens of *bolina* which I have ever seen both in size and in markings of the underside of the wings; and the vastly larger size of the *females*, and the corresponding difference in markings, all go, to my mind, to show that we are dealing with a valid form.

The expanse of the *females* of the form *iphigenia* of *bolina* taken by Doherty in Buru does not much exceed 70 mm. ; the expanse of the *females* of *H. lasinassa* is in some cases 108 mm. and never less than 95 mm. The *males* are all much larger than the largest *male* of *H. bolina* in the collection. The markings are different. In both sexes there is an entire absence of the white transverse median band on the underside of the primaries and secondaries, which is characteristic of *H. bolina*. The outer margins do not have the white markings on the fringe, which are characteristic of *H. bolina*. The marginal row of spots on the underside of the secondaries, which is geminated in *H. bolina*, is single in *H. lasinassa*. The blue discal spots on the upperside of the wings of the *males* are not centred with white, as in *H. bolina*, but are uniformly a deep purplish blue. If the two forms are sprung from the same insects, and are merely seasonal or dimorphic variations, we are confronted with one of the most remarkable facts in natural history. That they spring from one common ancestry I am quite willing to believe, and an examination of them must convince of this, but I cannot bring myself to believe that one brood of eggs will produce these two forms at the same time. They are as widely separate, for instance, as any two species of *Argynnis*, which are now recognized by naturalists as valid. Doubtless most existing species have had at some time a common ancestry, and the student of phylogeny is able often to tell where lie the lines of relationship, but relationship is not identity either in the case of individuals or species.

45. **H. alimena** (Linnaeus), *Mus. Lud. Utr.* p. 291 (1764).

There is a very large series of this species. The *males* are constant, but the *females* vary considerably. Some of the *females* are coloured upon the upperside like the *males*, others have the outer third of the secondaries laved with rufous, and still others are more or less strongly marked with white upon the secondaries.

46. **H. pandora** (Wallace), *Trans. Ent. Soc. Lond.* p. 281 (1869).

There is a small set of *males* and *females* of this fine species.

47. **H. antilope** (Cramer), *Pap. Er.* II. t. 183. f. E. F (1779).

A small series of this species, representing both sexes.

## GENUS PARTHENOS Hübner.

48. **P. nodrica** (Boisduval), *Voy. Astrol., Lep.* p. 126 (1832).

A good set of this distinctly marked species.

GENUS NEPTIS Fabricius.

49. **N. heliodora** (Cramer), *Pap. Ex.* III, t. 212, f. E. F (1782).

A few good specimens.

50. **N. venilia** (Linnaeus), *Mus. Utr.* p. 290 (1764).

A large series.

51. **N. neriphoides** sp. nov.

Closely allied to *N. neriphus* Hew., from which it may be distinguished by its much smaller size, and by the fact that the submarginal brown line on the primaries is not divided, as in *neriphus*, into two parts curving inwardly at their upper extremities, but is continuous, only showing a little jag or offset on the third median nervule. Furthermore, the red linear band running the length of the cell is not serrated on its upper margin as in *N. neriphus*, and the subapical spots are not divided by the subcostal nervures as in Hewitson's species, but are fused into a curved subapical band, not very much indented internally. The general tone of the underside of both wings is decidedly lighter than in *N. neriphus*. There are two specimens of this species, both *females*. I have another specimen in my collection coming from the southern peninsula of Celebes, a *male*, which is also referable to this species, and has long stood in my collection unnamed. *Type* from Burn.

Expanse 43 mm.

GENUS ATHYMA Westwood.

52. **A. eulimene** (Godart), *Enc. Meth.* IX, p. 429 (1823).

Four *males*.

GENUS SYMPHAEDRA Hübner.

53. **S. aeropus** (Linnaeus), *Mus. Lud. Utr.* p. 256 (1764).

Several *males* and one *female*.

GENUS DICHORRAGIA Butler.

54. **D. ninus** (Felder), *Wien Ent. Mon.* III, p. 185 (1859).

One damaged *male*.

GENUS APATURINA Herrich-Schaeffer.

55. **A. erminia** (Cramer), *Pap. Ex.* III, t. 196, f. A. B (1780).

A fairly good series of the *males* of this species.

GENUS EULEPIS Moore.

56. **E. pyrrhus buruanus** Rothschild, *Nov. Zool.* V, p. 582, f. 26 (1899).

A number of *mules* and one damaged *female*.



## GENUS MYNES Boisduval.

57. **M. dohertyi** Holland, *Ent. News* IV. p. 337. t. 15. f. 2. 3 (1894).

The collection contains four specimens, none absolutely perfect, of this species.

## FAMILY LEMONIIDAE Kirby.

## SUBFAMILY LIBYTHAEINAE Bates.

## GENUS LIBYTHEA Fabricius.

58. **L. narina** Godart, *Enc. Meth.* IX. p. 171 (1819).

Two specimens.

## FAMILY LYCAENIDAE Stephens.

## GENUS GERYDUS Boisduval.

59. **G. leos** (Guerin), *Voy. Coquille* t. 18. f. 8. (1829).

A large species of specimens. The species seems to be very common.

60. **G. buruensis** sp. nov.

♂. The male on the upperside very closely resembles *Paragerydus horsfieldi* (Moore). The colour of the wings on this side is uniform fuscous, with a narrow streak of paler colour on the middle of the primaries. The resemblance in colour and size to this well-known Javanese species is so close that at first sight it is almost impossible to distinguish the two. On the underside the wings are marked much as in *G. chinensis* Felder, but the submarginal row of spots on the primaries is continuous along the border and does not merely extend from the costa to the third median nervule as in that species.

♀. The female is darker upon the upper surface than the male, and the usual differences in the form of the wing are observable in this sex. The streak of pale ochraceous found upon the primaries of the male is replaced in the case of the female by a small subtriangular spot of pure white.

I at first thought that this insect might be the form described by Ribbe as *ceramensis*, Iris II. p. 247, but I have finally changed my opinion, and I am also quite clear from the figure given by Standinger, Iris II. t. 1. f. 2, that it is not the species named by him as *Miletus philippus*, though some of the parts of his description might apply to it. I have therefore ventured to describe it as a new species.

## GENUS SPALGIS Moore.

61. **S. epius** Westwood, in Doubl. Westw. & Hew., *Gen. Diurn., Lep.* II. p. 502. t. 76. f. 5 (1852).

There are several specimens in fair condition, and a number which are very poor. I cannot distinguish them from specimens coming from India and Burmah and contained in my collection. I confess that I am somewhat sceptical as to the validity of the species named *S. pharnus* Feld., of which I possess specimens, believed to be accurately determined, from Amboyna. Except for the reduced size, or occasional absence of the light spot on the upperside of the primaries, this form does not appear to me to differ greatly from *S. epius* Westwood. The markings of the underside appear to me to be identical.

## GENUS HOLOCHILA Felder.

62. *H. ilias* (Felder), *Sitzber. Ak. Wissensch. Wien, Math. Nat. Cl. XL.*  
p. 454 (1860).

Apparently not common.

## GENUS HYPOCHRYSOPS Felder.

63. *H. anacletus* Felder, *l.c.*

Only three *females* were received. They were considerably smaller than the figure given by Felder in the Novara Reise, and a little larger than a suite of specimens coming from Amboyna, which I purchased some years ago from Dr. Standinger, and to which I added a series obtained from Messrs. Watkins & Doncaster.

## GENUS PITHECOPS Horsfield.

64. *P. dionisius* (Boisduval), *Voy. Astrol., Lep.* p. 82 (1832).

Apparently quite common. The crucial test between the genus *Pithecopis* and the genus *Neopithecopis* is said by Distant to be furnished by the anastomosis of the first subcostal with the costal nervure. Tried by this test, *dionisius* comes very plainly under Horsfield's genus.

## GENUS MEGISBA Moore.

65. *M. malaya* (Horsfield), *Cat. Lep. E.I.C.* p. 70 (1828).

*Lycaena strongyle* Felder, *Reise Novara, Lep.* p. 278. t. 34. f. 32. 33 (1865).

Apparently common, though few of the specimens sent were in good case. I think there can be no doubt of the identification made by Dr. Semper of Felder's species with that described by Horsfield. I have a large series of *M. malaya* coming from various parts of India and the Malay Peninsula. Comparing these closely with the specimens before me, which agree absolutely with Felder's figure, I am certain that so far as the underside of the wings is concerned there is no difference whatever. The only difference discernible to me is that specimens from the Asiatic mainland are all a little larger, and the white spot on the disc of the primaries is relatively a little smaller, and not quite so sharply defined as in the specimens from Burn and Amboyna in my collection. There is therefore a slight difference in facies, so far as the upperside of the wings is concerned. This is all, and not enough to warrant the specific separation of the two forms.

## GENUS CYANIRIS Dalman.

66. *C. cagaya* (Felder), *Reise Novara, Lep.* p. 278. t. 34. f. 11—13 (1865).

There are several *males* and one or two *females*, which, after much deliberation, I am led to assign to this species, though the specimens do not agree with absolute exactness with the figures given by those who have represented the species. They are very close to *C. puspa* Horsf., but differ from that species in the absence in the *male* sex of the dark border of the primaries, which is greatly reduced, and in some cases almost altogether wanting. There is also very little, if any, white upon the disc of the primaries in this sex. *Cagaya* is evidently the more southern race of *C. puspa*.

67. *C. philippina* Semper, *Tygf. Philipp.* p. 168. t. 32. f. 14—18 (1889).

There is a good suite of *males* of a species, which appears to me to be the foregoing. At all events, though I could wish to be a little more certain upon this point, I can find no description of any species of *Cyaniris* which applies better to the specimens before me. Semper relies apparently more upon his plates than upon the letterpress of his work, and the few remarks he makes about this species do not throw much light upon certain points, upon which his plates fail equally to give information. The specimens before me all have a little white upon the disc of the primaries and on the costa of the secondaries. Semper says nothing about this in his description, which is, however, so meagre as to hardly merit to be called such; and the plates, which are made by a photographic process, also fail to tell us anything about this point. Blue surfaces in photography often take lighter than white surfaces. On the underside Semper's figures agree with my specimens, spot for spot, though the markings in some of the examples before me are heavier and more pronounced than they appear in the plates in the Butterflies of the Philippine Islands.

#### GENUS ZIZERA Moore.

68. *Z. gaika* (Trimen), *Trans. Ent. Soc. Lond.* (3). I. p. 403 (1862).

A large number of specimens of both sexes of this widely distributed form.

69. *Z. subcoerulea* sp. nov.

♂. The body is fuscous on the upperside, and is clothed with bluish hairs. The underside of the body is pale whitish grey. The legs are also whitish grey, marked with darker grey upon the outer edges of the tibiae, and on the tarsi. The palpi are white, edged below with blackish hairs. The antennae are black above, and below are ringed with white. The wings on the upperside are pale purplish blue, almost of the same tint as light-coloured specimens of *Catochrysops strabo*, but without the sheen of that species. On the costa near the base most specimens in certain lights show a white lustre. Both wings are marked by a fine blackish marginal line, within which on each interspace along the border are small innular markings, those of the primaries diffuse, and pale ashen greenish, paler than the body of the wing, rarely fuscous; those of the secondaries pale fuscous, marked inwardly and outwardly by paler grey. The fringes are grey, lighter on the secondaries than on the primaries, and distinctly interrupted at the end of each nervule by darker fuscous. On the underside both wings are pale cool grey. Both are ornamented by spots of pale brown, only a shade darker than the body of the wings, and uniformly surrounded by light whitish lines and markings. These markings are as follows: On the primaries there is a longitudinal transverse mark at the end of the cell, a discal series of spots crossing the wing from the costa to the inner margin about two-thirds of the distance from the base, one spot on each interspace, the whole series being conformed in a regular curve to the line of the outer margin. This series of spots is succeeded near the margin by a double series of innules, the spots composing the inner series being larger than those of the outer series. Both sets of innules are margined on both sides by pale grey, but in the case of the inner series this pale grey colour is extended diffusely inwardly almost as

far as the series of discal spots, giving to the wing the appearance at first sight of being crossed by a transverse whitish band. The margin is indicated by a fine dark line. The fringes are paler than on the upperside. The same markings which are found upon the primaries are continued upon the secondaries, and quite as evenly, except that the discal series above vein 6 is broken, by having the two upper spots nearest the costa shoved inwardly toward the base, being located one above the other a little before and above the end of the cell. In addition to the spots composing the three outer series there is a longitudinal transverse mark at the end of the cell, a round spot about the middle of the cell, and another small spot above it near the costa.

♀. The *female* on the underside is marked exactly like the *male*, but the primaries on the upperside are broadly dark fuscous on the costal and outer marginal areas. There is a single *female* of this species in the collection in which the entire upper surface of both wings is dark fuscous.

Expanse: ♂ and ♀ 20—25 mm.

When I originally undertook to work up the collection I provisionally referred this species to *Z. otis* (Fabr.), but a closer study has revealed the incorrectness of this procedure, and after a lengthy study of the entire subject I am compelled to believe that we are dealing here with an undescribed species. It is in size much like *Z. maha*, and suggests that species by its colouration, but the markings of the underside are wholly different. The markings do not agree with those of any other species of the genus which I have seen (and almost all of them are represented in my collection), nor with the descriptions given by authors. The pale whitish space between the discal series of spots, and the inner marginal row of lunules, and the absence of dark markings on the edge of the primaries of the *male* sex, are easily seen characteristics. The insect belongs to the second group of the genus indicated by De Nicéville, which lack the inner spot in the cell of the primaries.

#### GENUS LYCAENESTHES Moore.

70. *L. lycaenoides* (Felder), *Sitzber. Ak. Wissensch. Wien, Math. Nat. Cl. XI.* p. 454 (1860); ? *Pseudodipsas lycaenoides*, Felder, *Reise Nocera, Lep.* p. 258. t. 30. f. 25. ♂ (1865).

De Nicéville, *Butt. India III.* p. 128, sinks *lycaenoides* Felder, as a synonym of *Lycaenesthes emolus* (Godt.) = *bengalensis* Moore, following, with evident reluctance, the example of Hewitson. I cannot at all concur in this course. With an abundance of specimens of *L. emolus* = *bengalensis* Moore, in both sexes before me from various parts of India and Burmah, and with the figure of Felder, and a large snite of specimens of *L. lycaenoides* Felder coming from Amboyna and Buru, it is impossible to accord the correctness of Mr. Hewitson's opinion. I am also constrained to believe that the insect, which Hewitson figured as *L. lycaenoides* Felder, evidently a *female*, *Illustr. Diurn., Lep.* p. 219. t. 92. f. 39, is not Felder's insect. The *females* in my possession differ too widely from the figure of Hewitson to allow of their identification with the butterfly he depicts, though his figure is evidently very carelessly executed. If it represents the *female* of Felder's species it must be set down as a rather unfortunate attempt to follow nature.

The difference between *L. lycaenoides* Feld. and *L. emolus* (Godt.), accepting the identification of *L. bengalensis* Moore with the latter species as established, is



revealed first of all in the character of the broad submarginal band on the primaries. In *L. emolus* this band is well described by Moore as being "chain-like," whereas in *L. lycaenoides* Feld. the band is more continuous, that is to say, the light lines defining it on both sides are straighter, and the band consequently presents more even margins both externally and internally, a feature brought out in Felder's figure. Secondly, the underside of the secondaries in Felder's species has the lines and strigae somewhat differently arranged, as well as more numerous than in *emolus*. They are, moreover, as well as the whole outer margin of the wing, lighter in colour than in *emolus*, so that the wing has quite a different cast. The *female* is very different, and as no full description of this sex has apparently been given I herewith append one:—

♀. The primaries on the upperside have the costal and outer marginal areas very broadly blackish. The middle and basal areas of the wing along the inner margin are blue, darkest at the base. The blue colour extends a little upon the lower edge of the cell, and becomes lighter just beyond the lower angle of the cell. The secondaries are blue shading into brown at the base, and with the veins somewhat broadly brown. There is a submarginal and a marginal row of light lunules, the inner series fainter in colour than the outer series. The space between these two rows of lunules is fuscous. The outer row of lunules is accented externally by a corresponding series of dark triangular spaces, which toward the anal angle become a deep black. The margin is indicated by a fine white marginal line. The fringes are black, tipped with light brown, and at the extremities of veins 1, 2, and 3 are produced as short tails, tipped with white, the tail at the end of vein 2 being the longest. On the underside both wings are greyish fawn, a trifle darker at the base of the wings: the primaries at the end of the cell have a transverse short band of darker drab extending from the costa to the lower outer angle of the cell, and defined inwardly and outwardly by fine whitish lines, of which the one on the outer margin of the spot is extended upward to the costa. Beyond this spot and extending from the costa to the inner margin is a broad, rather even submarginal band of the same drab colour, bordered on both sides by fine whitish lines. There is a marginal series of confluent dark lunules, one on each interspace. These lunules, like the inner bands, are margined on either side by fine whitish lines. The margin is indicated by an exceedingly fine white line. The fringes are brown, as on the upperside. The fringes of the secondaries are dark brown tipped with lighter brown. The margin is indicated on the secondaries, as on the primaries, by a fine but very distinct white line. The marginal series of confluent lunules appearing upon the primaries reappears upon the secondaries, the triangular external spaces being darker than upon the primaries. Between veins 2 and 3 there is a conspicuous black ocellus, surmounted with a lunule of orange red and sprinkled with a few bluish scales. The middle and basal areas of the secondaries are marked by a number of short lines or strigae arranged in a very intricate manner, scarcely admitting of accurate description.

#### 11. *L. pegobates* sp. nov.

♀. The body on the upperside is fuscous, clothed more or less with blue hairs, particularly upon the thorax. The lowerside of the body is yellowish white. The legs are white, with the tibiae edged externally with grey and the tarsi ringed with the same colour. The first and second joints of the palpi are white, the third black. On the upperside the primaries are broadly dark fuscous on the costal



and outer marginal areas. The basal area from the inner margin as far as the middle of the cell is dark smalt blue, passing into pale bluish white beyond the lower outer angle of the cell. The secondaries are pale fuscous, with the basal area in the region of the cell shot with smalt blue. This wing is crossed by a broad rather regular fuscous band running from the costa before the outer angle toward the anal angle, which it does not quite reach. The margin is indicated by two fine bluish white lines, separated by a narrow dark line. The fringes are dark fuscous, as on the primaries, but are edged with paler fuscous, and produced at the extremities of veins 1, 2, and 3 as short tails, of which the one at the end of vein 2 is the longest. All of these tails are tipped narrowly with white.

On the underside both wings are pale fawn. There is a short transverse band of slightly darker fawn running from the costa to the lower angle of the cell margined by narrow white lines. This is succeeded by a broad dark band running from the costa and retracted a short distance along the inner margin, and edged on either side with white lines. A fine white line runs from the costa toward the inner margin, bending outwardly about the middle of the wing, and coalescing with the white line which defines the broad outer band before the inner margin is reached. Beyond this line we still have two other fine white lines along the margin, separated by a narrow dark line. The fringes are uniformly fuscous. The lines and bands of the outer marginal area of the primaries are produced upon the secondaries. There is a very small and obscure ocellus between veins 2 and 3, having a black centre, surmounted by orange red. The discal and basal portion of this wing is marked by numerous fine white lines arranged in intricate patterns.

Expanse : 30 mm.

Type unique.

This species is closely allied to the preceding, but the pattern and direction of the transverse lines and bands on both sides of the wings are very different. No tendency to the breaking up of the lines and bands of the margins into lunules is revealed, and the entire facies is different. Unfortunately there does not appear to be any *male* to which I can refer this specimen—a fact for which I must express deep regret.

#### GENUS TALICADA Moore.

##### 72. *T. buruana* sp. nov.

This species is closely allied to *T. arruana* Feld., from which it is easily distinguished by the fact that the *males* are very light blue on the upperside of the wings, and not dark blue as in Felder's species. Furthermore, there is an entire absence in both sexes of the dark red marking near the anal angle of the secondaries, which are characteristic of *T. arruana*. The *female* is dark fuscous on the upperside of the primaries and secondaries, with the wings shot near the base with silvery bluish white. This may be regarded as the Burnan form of Felder's species.

#### GENUS EVERES Hübner.

##### 73. *E. argiades* (Pallas), *Reise* I. App. p. 472 (1771). (For synonymy compare De Nicéville, *Batt. India* III. p. 137.)

There are a few of this species in both sexes.

## GENUS NACADUBA Moore.

74. **N. ardates** (Moore), *Proc. Zool. Soc. Lond.* p. 574. t. 67. f. 1 (1874).

The collection contains a number of *males*, of which all but one are of the tailless form.

75. (?) **N. aluta** (Druce), *Proc. Zool. Soc. Lond.* p. 349. t. 32. f. 6 (1873);  
id., *l.c.*, p. 578. t. 32. f. 13. 14 (1895).

It is with some doubt that I refer two specimens in the collection to this species. They are smaller than they ought to be to agree with the account of the species given by Mr. H. H. Druce, and are darker blue on the upperside than represented in his figure.

76. **N. ancyræ** (Felder), *Reise Novara, Lep.* p. 276. t. 34. f. 5 (1865).

A few *males* of this species.

77. **N. berœ** (Felder), *Reise Novara, Lep.* p. 275. t. 34. f. 36 (1865).

A large number of *males* and three poor *females*, which I refer to this species.

78. **N. albofasciatus** (Röber), *Iris* I. p. 65. t. 4. f. 21. ♂ (1885).

Röber describes and figures the *male*. The collection before me contains no *male* specimens, but two *females*, which agree so closely on the underside with the figure given by Röber that I am constrained to refer them to this species. They are unlike any other insect in the genus known to me, and I believe my determination to be correct.

79. **N. cladara** sp. nov.

♂. The body is fuscous, more or less clothed with blue hairs on the upperside. The thorax and legs are quite dark, the abdomen on the underside is pale grey. The palpi are black. The antennae are black, slightly ringed with white on the underside. The wings on the upperside are pale morpho-blue, somewhat clouded in certain lights with pale brown at the base. Both are margined with a fine black line, and the primaries are very lightly edged in addition with fuscous on the margin, most noticeably near the apex. There is a minute black spot near the anal angle. On the underside the wings are sordid brown, becoming darker toward the base, where they are almost black. The primaries have a transverse band on the middle of the cell produced beyond it as far as the first median nervule, another similar band closing the end of the cell, and beyond this running from the costa to the submedian nerve a catenulate band bent outwardly opposite the cell. All of these bands are margined with fine whitish lines, and are a shade darker than the adjacent parts of the wing. In addition, there is on the primaries a double row of marginal lunules, also bordered on either side by pale diffuse lines. The secondaries on the underside are furnished with a subbasal curved series of spots like those on the primaries, running from the costa to the inner margin. The cell is closed by a fine whitish line, defined externally by a darker band of the same length, which is followed by an irregularly curved series of dark markings, the spots opposite the end of the cell being thrust outwardly and the pale lines

defining them coalescing with a series of lines running from the outer angle to the third median nervule. The double series of lunules appearing on the primaries is produced upon the secondaries, but between veins 2 and 3 is interrupted by a conspicuous black ocellus, surmounted with a red lunule, and having a few iridescent bluish green scales on its outer margin; there are also two similar, but much smaller, black spots at the anal angle, likewise ornamented with bluish green scales.

Expanse : 25 mm.

Described from three male specimens.

**80. *N. poecilta* sp. nov.**

♂. The upperside of the body is dark fuscous, clothed with pale blue hairs; the lowerside of the body and the legs are blackish. The abdomen on the lowerside is narrowly marked with pale grey. The palpi are black. The antennae are black, ringed with white on the lowerside. Both wings are very pale violet-blue, in certain lights having a pale brown cast, especially about the base. The margin of both wings is defined by a very fine black line. The fringes are white, checked with fuscous at the ends of the nervules. At the end of vein 2 on the secondaries there is a short tail, fuscous, tipped with white. On either side of the extremity of the same vein are two small dark spots, narrowly edged outwardly by fine white lines. On the underside the wings have the outer margin pale grey, almost white, with the discal and basal areas broadly suffused with dark mouse-grey. The primaries are marked by three transverse bands of dark blackish brown, defined inwardly and outwardly by light lines, which on the costa are represented by small very distinct white spots. These bands are: 1st, a subbasal band extending from the costa across the cell to the submedian nerve; 2nd, a discocellular band, covering the end of the cell; and 3rd, a catenulate discal band, running from the costa to the submedian nerve. In the latter band the three spots, which are opposite the cell, are somewhat dislocated, and pushed forth in the direction of the outer margin. There is a double series of pale grey lunules along the margin, irregular in size, the upper one of the outer series at the apex being the largest and quite conspicuous, those about the middle of the margin tend to become obsolete. The secondaries on the underside are crossed by a basal curved catenulate band, by a discocellular bar, followed closely by an irregularly curved discal catenulate band. All of these bands are dark blackish brown, and the maculae composing them are edged with lighter colour. There is a double row of rather irregular marginal lunules, grey in colour, edged with white. Between veins 2 and 3 there is a conspicuous ocellus, surmounted with an orange-red lunule, its deep velvety black central spot marked externally by a very fine lunette of bluish green. Another very small ocellus is situated at the anal angle.

Expanse : 26 mm.

There is a single specimen of this species in the collection, marked by Mr. Doherty "*Nacaduba*, species incerta." I have another specimen in my collection coming from Amboyna, and purchased by me several years ago in a lot of Amboynese material. In the Amboynese example the ground colour is somewhat paler, and the outer margins are broadly whitish. In consequence the transverse markings stand forth much more conspicuously in this specimen. This thing I at one time thought was the hitherto undescribed and unfigured male of *N. palmyra* Feld, the words in Felder's description (*Sitzber. Ak. Wiss. Wien, Math. Nat. Cl.*

XL. p. 458), "*alis caudatis, ciliis albis, fusco intersectis*," seeming to furnish a clue. So far as my observation goes, the only *Nacaduba* to which these words apply is the species before me. I do not know *N. palmyra* Feld., save by his description and the figure, which is that of a female, and wholly unlike the insect above described, if the text and plate are safe guides.

81. *N. glenis* sp. nov.

♀. The body on the upperside is black, more or less clothed with bluish hairs; on the underside the body is pale grey. The legs are whitish, streaked and ringed with grey. The first and second joints of the palpi are white, the third joint is black. The front is white. The antennae are black, ringed below with white. The wings on the upperside are dark fuscous, shading on the costa of the primaries and the outer margins of both wings into black. Both wings at the base are shot with royal purple, only visible in certain lights. On the underside both wings are broadly yellowish ochraceous. The primaries have a discocellular brown bar, edged on both sides by fine pale yellow lines; a discal catenulate transverse band, bowed out before the end of the cell, and running from the costa to the submedian nerve, the spots composing it coloured and defined as the bar at the end of the cell. In addition there is a double series of submarginal fuscous markings defined on both sides by light poorly defined lines. The inner row of these markings is very uniform in size, more or less quadrate, and larger than those composing the outer row, which are small and distinctly lunulate. The fringes are dark fuscous. The secondaries on the underside have a subbasal series of three subquadrate spots, a discocellular bar, and a discal curved series of spots, all of which are defined more or less sharply on both sides by pale yellow lines. The double series of marginal markings of the primaries is continued upon the secondaries. The inner row is strongly accentuated on the side toward the base by broad, pale yellowish transverse lines or bands, the outer row of lunules is composed of spots gradually increasing in size from the outer angle, until they culminate in a large ocellus, between veins 2 and 3. The two spots antecedent to this ocellus are distinctly ocelliform. The large ocellus is black, ringed with yellowish, and without any blue-green scales. There are two minute black lunular markings at the anal angle.

Expanse 25 mm.

Type unique.

There is no *male* in the collection corresponding to this insect, and, so far as I know, there is nothing just like it which has hitherto been described or figured. The broadly yellowish ochraceous tint of the underside is very characteristic.

GENUS JAMIDES Hübner.

82. *J. astraptēs* (Felder), *Sitzber. Ak. Wissensch. Wien, Math. Nat. Cl.* XL. p. 456 (1860).

A large series of *males* and *females*. Apparently very common.

83. *J. porphyris* sp. nov.

♂. The primaries on the upperside have the outer margin somewhat narrowly edged with black; the secondaries have the costal, outer and inner margins very



broadly margined with black ; the remainder of the upper surface of the wings is very deep royal purple, with little or no sheen. On the underside I am unable to distinguish the markings of this species from those of *J. astrartes* and those of *J. bochus*, except that the ground colour of the wing is a paler whitish grey.

♀. The *female* is marked on the underside like the *male*. On the upperside the wings are very broadly black, being merely shot lightly at the base with royal purple. The secondaries have the outer margin defined more or less distinctly toward the anal angle by a fine white line, above which are three or four small spots, darker than the adjacent parts of the wing.

Expanse ♂ 18—25 mm., ♀ 28 mm.

Described from numerous *males*, one *female*.

#### GENUS LAMPIDES Hübner.

84. *L. hylas* (Cramer), *Pap. Exot.* IV. t. 363. f. E. F (1782).

Apparently very common.

85. *L. celeno* (Cramer), *l.c.* I. t. 31. f. C. D (1775).

A few specimens.

86. *L. aratus* (Cramer), *l.c.* IV. t. 369. f. A. B (1782).

Apparently not uncommon.

87. *L. callinicus* (Röber), *Iris* I. p. 58. t. 4. f. 15 (1884).

What I take to be this species is represented in the collection by a few *males* and more numerous *females*.

88. (?) *L. nemea* Felder, *Sitzber. Ak. Wiss. Wien.* XL. p. 455 (1860).

It is with some doubt that I refer the two specimens before me to this species.

89. *L. buruana* sp. nov.

♂. The *male* on the upperside has much the appearance of *L. aratus* Cram., but the wings on the upperside of the primaries in particular are overshot with a deeper blue iridescence, the outer margin of the primaries is more heavily edged with dark fuscous, and the subbasal dark band of the underside shows through upon the upperside as a pale dark band parallel to the outer margin. The secondaries on the upperside have the margin distinctly defined by a black line, followed by a row of marginal lunules, surrounded with white, the one between veins 2 and 3 being distinctly ocelliform. This row of lunules is succeeded inwardly by a submarginal row of dark fuscous spots, more or less quadrate in form. On the underside the wings are pale fawn crossed by white lines, the arrangement of which is simpler than in *L. aratus*, the most striking difference being the fact that on the primaries the two lines at the end of the cell are continued directly as parallel lines to the submedian nerve. These lines are succeeded by two parallel curved subapical



lines, the innermost reaching to the second median nervule and the outermost to the third median nervule. There is a broad submarginal band of quadrate dark spots, and a marginal series of lunules, both bordered inwardly quite broadly with white, the margin is indicated by a fine white line followed externally by a fine but very distinct black line. The fringes are fuscous, tipped with white. The secondaries have the marginal markings of the primaries continued upon them, the series of lunules being interrupted by a large ocellus, between veins 2 and 3, deep black, surmounted by a lunule of orange-red, and irrorated with bluish green scales. The discal and basal areas are crossed by five transverse lines, broken on vein 6, and all tending to unite by their lower extremities at a point about the middle of vein 2. On the inner margin there are three parallel short lines running from vein 2 upwardly in the direction of the insertion of the wing.

♀. The *female* is much like the *male*, but all the markings are heavier and more distinct, and the upper surface of the wings lacks the bluish sheen of the *male*, being more milky white. Furthermore the apical area of the primaries on the upperside is somewhat broadly laved with dark fuscous.

Expanse ♂ 28—32 mm., ♀ 25—33 mm. Described from six *males* and six *females*.

I reluct at describing another species in this genus, in which the differences are often found to reside merely in a shade of colour, or the arrangement of a few lines in the underside of the wing, but in this case the specimens before me are so constant in their markings and are so totally distinct in their facies from any other species known to me, that I am compelled to regard them as, if not a distinct species, at least representing a well-defined local race. There is nothing exactly like them so far as I can see which has been described or figured elsewhere.

#### GENUS CATOCHRYSOPS Boisduval.

90. **C. strabo** (Fabricius), *Ent. Syst.* III. 1. p. 287. n. 101 (1793).

Apparently common. The specimens are all relatively small, much less in expanse of wings, than the specimens of the following species, which I think is surely only a dimorphic form of the *male*, but which I still allow to stand until we shall have this surmise proved by the experiment of breeding.

91. **C. lithargyria** (Moore), *Ann. Mag. Nat. Hist.* (4). XX. p. 340. (1877).

This is certainly not specifically distinct from the foregoing species, and will no doubt turn out, when the test of breeding is applied, to be the dimorphic *male* of *C. strabo*.

Very common. The *females* are not separable from those of *C. strabo*, if the *females* enclosed in the same envelopes with *lithargyria* are certainly the *females* of this form, which I believe that they are.

92. **C. cnejus** (Fabricius), *Ent. Syst. Suppl.* p. 430 (1798).

Not at all scarce.

#### GENUS AMBLYPODIA Horsfield.

93. **A. anna** Standinger, *Exot. Tagf.* I. p. 282 (1888).

The collection contains two *males* and three *females* of this species, not all quite perfect.

## GENUS ARHOPALA Boisduval.

94. *A. carolina* sp. nov.

♂. This species belongs to the *anthore* group, and comes in some respects quite near *A. polita* Röber, but may at once be distinguished from that species by the arrangement of the spots on the underside of the secondaries, which instead of being more or less rotund, as in *A. polita*, are elongated transversely, giving the wing a barred appearance.

♀. The *female* is like the *male*, but lacking much of the purple gloss on the costal and apical tracts of the primaries, which are margined with plain black, broadly on the margin at the apex, the black band narrowing gradually until it vanishes at the outer angle.

Expanse ♂ and ♀ about 40 mm. Described from five *males* and one *female*.

95. *A. fulla* Hewitson, *Cat. Lye. B. M.* p. 19. t. 6. p. 67, 68 (1862).

Hewitson describes and figures the *male*. The *female* is exactly like it on the underside, but is distinguished upon the upperside by having the costae of both wings as well as the apex of the primaries broadly dull black, and the outer margins of both wings of the same colour.

The collection contains a large number of *males*, but only two *females*.

96. *A. buruensis* sp. nov.

♂. The upperside of both wings is uniformly dark purplish blue, with the external border of the primaries quite narrowly bordered with black-fuscons. On the underside both wings are ochraceous-fuscons crossed with darker spots and bands, which are bordered narrowly, especially on the secondaries, with fine lighter lines. These spots and bands are very little darker than the body of the wings, and in certain lights are rather obscure. They are disposed as follows:—Upon the primaries there is a faint submarginal band running from the costa to the inner margin; this is followed by a catenulate discal band rather more distinct than the first mentioned, and extending from the costa to the submedian nerve; the cell is closed by a short discocellular bar: there is a circular spot in the middle of the cell and a small and obscure spot on either side of the first median nervule at its origin below the cell. On the secondaries there are three small spots increasing in size from the side of the base toward the outer margin, and equidistantly located just below vein 8: a small spot in the cell near the base, one in its middle, and a short transverse bar at the end of the cell; an irregular catenulate curved band of spots marks the disc, below the cell and along the inner margin are a few transverse pale lines. The outer third of the wing is free from maculations, except about the anal angle, which is rather conspicuously marked with whitish curved striae, and dark lunules, three in number, irrorated with bluish green scales.

♀. The *female* on the underside is marked exactly like the *male*, the chief difference between the two sexes in the matter of their markings being the fact that on the primaries the *female* has the costa and the apical area broadly velvety black, the line of demarcation between the blue ground colour and the black space being almost straight from a little beyond the base to the outer extremity of the third median nervule. The outer margin is also in this sex somewhat broadly black upon the primaries.

Expanse ♂ 32—36 mm., ♀ 30 mm.

Described from five *males* and one *female*.

This species is very near to *A. kounga* Druce from Borneo, but differs in having the primaries more acute, and in the entire absence of all markings from the outer third of the secondaries on the upperside before the outer angle. These points will serve among others to discriminate it from Druce's species, as well as from others.

GENUS HYPOLYCAENA Felder.

97. **H. sipylus** (Felder), *Sitzber. Ak. Wissensch. Wien, Math. Nat. Cl.*  
XL. p. 451 (1860).

Quite common.

GENUS DEUDORIX Hewitson.

98. **D. epijarbas** (Moore), in Horsfield & Moore, *Cat. Lep. Mus. E. I. C.*  
p. 32 (1857).

A few *male* specimens.

GENUS BINDAHARA Moore.

99. **B. isabella** (Felder), *l.c.*

A number of *males* and a couple of poor *females*.

GENUS HYPOCHLOROSIS Röber.

100. **H. buruana** sp. nov.

♂. This species appears to be an intermediate form between *H. antipha* Hew. and *H. lorquini* Feld. The *male* has the discal areas of both wings on the upperside white margined more or less with pale diffuse blue, passing over into the deep black of the outer margin and the dark fuscous of the base. On the underside there is a total absence of the dark discal markings on the secondaries figured by Hewitson as occurring in the case of *H. antipha*.

♀. The *female* is without any blue on the upperside of the wings.

There is a small series of this beautiful insect, which can easily be discriminated from the other two species by the points of difference pointed out above.

FAMILY PAPILIONIDAE Leach.

SUBFAMILY PIERINAE Swainson.

GENUS ELODINA Felder.

101. **E. bouruensis** Wallace, *Trans. Ent. Soc. Lond.* (3). IV. p. 319 (1867).

Two examples, one badly shattered.

GENUS TERIAS Swainson.

102. **T. drona** Horsfield, *Cat. Lep. E. I. C.* p. 137. t. 1. f. 13 (1829).

A few specimens

103. **T. hecabe diversa** Wallace, *Trans. Ent. Soc. Lond.* (3). IV. p. 324 (1867).  
Not uncommon.

104. **T. tilaha** Horsfield, *Cat. Lep. E. I. C.* p. 136 (1829).  
A few specimens.

105. **T. candida** (Cramer), *Pap. Exot.* IV. t. 331. f. A (1782).  
A good set of specimens of both sexes.

GENUS APPIAS Hübner.

106. **A. bouruensis** (Wallace), *Trans. Ent. Soc. Lond.* (3) IV. p. 379 (1867).

The collection contains a single *female* answering exactly to the description given by Wallace, and another which is exactly like it, except that the red spaces on the wings are replaced by yellowish white, showing that this sex is distinctly dimorphic. The light-coloured *female* agrees very well with the figure of *T. fatima* Vollenhoven, *Tijdschr. v. Ent.* p. 59. t. 2. f. 1. 2 (1865), except that the discal bands of light colour on both wings are much broader in the insect before me than they are in the figure of *T. fatima*. Mr. Doherty writes as follows as to this species: "Of *T. bouruensis* Wall. I unluckily caught no *male* (one was seen just like *zarinda* in appearance), so that you cannot compare it with *zarinda*. As it happened, I got two *females*, one white, the other red. The white form is probably *T. fatima* Voll. In the small set I got in the Celebes there are two similar forms."

107. **A. jacquinoti** (Lucas), *Rev. et Mag. Zool.* p. 326 (1852).  
Two poor *males*, three fairly good *females*.

108. **A. ada** (Cramer), *Pap. Exot.* t. 363. f. C. D (1782).  
A very large series of this species, composed of both *males* and *females*, is contained in the collection.

109. **A. paulina** (Cramer), *l.c.* II. t. 110. f. E. F (1779).  
A large number of *males*, only one *female*.

110. **A. albina** (Boisduval), *Spec. Gen.* I. p. 480 (1836).  
A few tattered *males*, and several *females* in better case. This is quite distinct from *T. jacquinoti*. I must dissent from Mr. Kirby, who has sunk the latter species as a synonym of *T. albina*. The *females* as well as the *males* differ widely in the two species.

111. **A. eliada** (Hewitson), *Ex. Butt.* II. Pieris, t. 4. f. 27. 28 (1861).  
A few *males* only were taken.

## GENUS HUPHINA Moore.

112. **H. jael** (Wallace), *Trans. Ent. Soc. Lond.* (3). 1V. p. 335 (1867).

A very large series of specimens of both sexes. There is some variation in size and in the intensity of the markings in the specimens before me. I am unable to see any great difference between this form and *H. olga* Esch.

## GENUS DELIAS Hübner.

113. **D. philotis** (Wallace), *l.c.* p. 357 (1867).

A few *males* and two *females*.

114. **D. echo** (Wallace), *l.c.* p. 358. t. 8. f. 3. ♀ (1867).

Four *males*, no *females*.

115. **D. rothschildi** sp. nov.

♀. Near *D. dorimene* (Cram.), from which it differs by having the spots on the underside of the primaries smaller, and confined wholly to the apical tract. The outer marginal band on the secondaries is broader than in *dorimene*, and the yellow spots contained within it are also much larger. They are pyramidal with their apices pointing inwardly, and only the spot at the anal angle is divided. The ground colour of the secondaries on the underside is bright yellow, laved somewhat with orange. On the upperside of the *female* specimen before me the primaries are black, except for a short distance along the inner margin at the base, where they are white shading inwardly into bluish fuscous. The secondaries are white, very broadly and evenly bordered with deep black, this broad outer black marginal band being accentuated inwardly by a narrow band of bluish fuscous.

Expanse: 64 mm.

The type, which is unique, is not in very good condition, but what one wing lacks the other supplies.

## GENUS ERONIA Hübner.

116. **E. iobaea** (Boisduval), *Noy. Astrol., Lep.* p. 57. t. 3. f. 5. 6 (1832).

A single *male* specimen.

## GENUS CATOPSILIA Hübner.

117. **C. catilla** (Cramer), *Pop. Ex.* III. t. 229. f. D. E (1782).

A single *female*.

118. **C. crocale** (Cramer), *l.c.* I. t. 55. f. C. D (1779).

One *male*, three *females*.

## GENUS HEBOMOIA Hübner.

119. **H. leucogynia** (Wallace), *Journ. Ent.* II. p. 4. t. 1. f. 1. 2 (1863).

There is a good series of the *males*, and several *females*, only a few of which are in quite perfect condition.



## SUBFAMILY PAPILIONINAE Swainson.

## GENUS TROIDES Hübner.

120. **T. oblongomaculatus bouruensis** (Wallace), *Trans. Linn. Soc. Lond.* XXV. p. 38 (1865).

The collection contains a dozen pairs of this insect, in which there is considerable variation shown both by the males and the females, particularly by the latter. The chief variation in the male sex is in the extent of the black marking at the base and on the inner margin of the secondaries. In some specimens the black of the inner margin extends inwardly as far as the lower edge of the cell and to vein 2; in others it does not touch the lower edge of the cell nor nearly reach vein 2, in one case not extending much beyond vein 1. In a single specimen before me the inner marginal black area is pushed into the body of the wing almost to vein 3. The black at the base extends outwardly upon the cell in the majority of specimens only to about half its length, but in two cases it reaches almost to the end of the cell. The clear yellow discal patch on the disc of the wings is thus, as Mr. Wallace pointed out in his description, "variable in form and extent." One of the specimens agrees perfectly with Rippon's figure of *T. papuensis*, recently published. The females vary greatly in size and in the amount of the light colour on the primaries, as well as in the form and extent of the light colour on the secondaries, and of the black spots. The smallest female has an expanse of wing of 140 mm., the largest of 168 mm. Some specimens have very faint light line on either side of the nervules, others have the whole discal area at the end of the cell pale buff, intersected by the black lines of the veins alone. These constitute "merkwürdige Aberrationen," for which German dealers are in the habit of charging high prices, which I judge not to be at all uncommon in good sets of specimens of this and many of the allied species.

121. **T. hypolitus** (Cramer), *Pap. Ec.* l. t. 10. f. A. B. and t. 11. f. A. B (1775).

The collection contains a good set of the *males* and three *females* of this species, rather larger than specimens generally received from other localities, so far as my observation shows.

## GENUS PAPILIO Linnaeus.

122. **P. polydorus** Linnaeus, *Amoen. Acad.* VI. p. 407. n. 50 (1763).  
A large set of specimens.

123. **P. fuscus** Goeze, *Ent. Beytr.* III. l. p. 87 (1779).  
A few good specimens of both sexes.

124. **P. gambrisius buruanus** Rothschild, *Nov. Zool.* IV. p. 181. n. 4 (1897).  
A few *males*.

125. **P. ulysses** Linnaeus, *Syst. Nat.* ed. X. p. 462. n. 20 (1758).  
A good set of *males*, and a few *females*, not in the best condition.

126. **P. deiphobus** Linnaeus, *l.c.* p. 459. n. 6 (1758).

One male.

127. **P. sarpedon anthedon** Felder, *Verh. Zool. Bot. Ges.* XIV. p. 395. n. 217.  
p. 359. n. 124 (1864).

A good set of *males*; no *females*.

128. **P. eurypylus** Linnaeus, *Syst. Nat.* ed. X. p. 464. n. 37 (1758).

A few specimens.

129. **P. macfarlainei** Butler, *Proc. Zool. Soc. Lond.* p. 471. n. 39 (1877).

*Papilio aegistus* Cramer (*non* Linné), *Pap. Exot.* III. p. 81. t. 241. f. C. D (1782).

Apparently not very common.

130. **P. agamemnon plisthenes** Felder, *Reise Novara, Lep.* p. 79. n. 53 (1865).

Common.

131. **P. codrus** Cramer, *Pap. Ex.* t. 179. f. A. B (1779).

Two specimens.

#### FAMILY HESPERIIDAE Leach.

##### GENUS CASYAPA Kirby.

132. **C. corvus** (Felder), *Sitzber. Ak. Wissensch. Wien, Math. Nat. Cl.*

XI. p. 469 (1869): *id.*, *Reise Novara, Lep.* t. 73. f. 2 (1867).

*Chaetocneme cerinthus* Felder, *l.c.* ♀.

This species seems to be very common in Buru. There is some variation among the *males* in the length and distinctness of the pale yellow subapical band, and in one specimen it is almost obsolete. The same remark holds true of the band in the *female*, which in several specimens is somewhat reduced, and in one or two instances has the outer extremity near the outer margin separated from the remainder of the band, and set off as a triangular spot.

##### GENUS TAGIADES Hübner.

133. **T. japetus** (Cramer), *Pap. Ex.* IV. t. 365. f. E. F (1782).

A few specimens.

134. **T. martinus** Plötz, *Jahrb. Nass. Ver. Nat.* XXXVII. p. 47 (1884).

One specimen, which is a *male*.

##### GENUS SEPA Nicéville.

135. **S. noctis** (Staudinger), *Iris* II. p. 143 (1889).

A single *male* specimen.

## GENUS NOTOCRYPTA Felder.

136. **N. feisthameli** (Boisduval), *Voy. Astrol., Lep.* p. 159. t. 3. f. 7 (1832).  
*Plesioneura chimaera* Plötz, *Berl. Ent. Zeitch.* p. 262 (1881); Pagenst., *Jahrb. Nass. Ver. Nat.* XXXVII. p. 211. t. 4. f. 1 (1884).

This species was originally described by Boisduval from specimens coming from Amboyna and Burn, and the form found in this part of the Indo-malayan region may be taken therefore as typical. The figure given by Boisduval is quite characteristic. There is some variation in the number of the subapical spots, the male specimens before me all have these spots exceedingly minute, the one between veins 4 and 5 alone being distinctly observable, though quite small, the others requiring a glass to bring them into view. In the females the spots below the apex are more distinct. I cannot separate *N. chimaera* Plötz from the typical form. The figure given by Pagenstecher is that of a female. Specimens just like it are contained in the collection made by Doherty; and compared with the long series of *N. feisthameli* in my collection from all parts of the Indo-malayan region, I see no possible reason for the separation of the insect described and figured by Plötz and Pagenstecher from its fellows. *Chimaera* is an absolute synonym of *feisthameli*.

## GENUS TELICOTA Moore.

137. **T. augias** (Linnaeus), *Syst. Nat.* I. p. 794 (1767).

Three poor males.

138. **T. bambusae** (Moore), *Proc. Zool. Soc. Lond.* p. 691. t. 45. f. 11. 12 (1878).  
 Apparently scarce.

139. **T. prusias** (Felder), *Sitzber. Ak. Wissensch. Wien, Math. Nat. Cl.* XLIII. p. 44 (1861).

Only three specimens, notably darker on the underside than specimens coming from Amboyna and Batchian contained in my collection, agreeing in this with specimens coming from New Guinea and Northern Australia.\*

140. **P. palmarum** (Moore), *Proc. Zool. Soc. Lond.* p. 690. t. 45. f. 6. 7 (1878).  
 A good series of males, but no females.

141. **T. dara** (Kollar), in Hügel's *Kaschmir* IV. p. 455 (1848).

I accept, in the attitude of one who desires more light, the synonymy of this species as recently worked out by Elwes in the Transactions of the Zoological Society. Perhaps it is correct to gather together under the name given by Kollar the various forms described by other writers, and I am willing for the time to let it be so, but my critical sense rebels in a measure against the procedure. The specimens before me as I write were originally determined by me as belonging to *macroides* Butler, but are larger and brighter than specimens coming from India, Burmah, and other more northern localities, and contained in my collection.

\* It is worth noting just here that *T. simplex* Elwes, *Trans. Zool. Soc. Lond.* vol. XIV. p. 253. t. 19. f. 15. is identical in every respect with the insect described by me in the *Proc. Bost. Soc. Nat. Hist.* XXV. p. 79. t. 4. f. 4, as *Telicota subrubra*. I do not wonder that Mr. Elwes, with the wretched caricature given in the plate, which is a reproduction of a photograph, was unable to recognize it.

It is worthy of remark that *Pamphila omaha* Edwards, = *mingo* Edw., of which latter the type is in my collection, is apparently identical with *T. maesoides* Butler, which Elwes sinks as a synonym of *T. dara* (Kollar). There is some doubt as to the origin of the types of *P. omaha*. The specimens described as *P. omaha* came from the collection of the late Mr. Newman of Philadelphia, and were ticketed "Pike's Peak, Colorado." After writing his description, Mr. Edwards returned the specimens to their owner. Subsequently he re-described the species under the name *mingo*, basing his description upon a specimen said to have been taken in Kanawha County, West Virginia. This is the specimen standing in my collection. The specimens originally described as *P. omaha* by Edwards are believed to be the ones now standing in the collection of the American Entomological Society in Philadelphia. They are mounted on common pins. The type of *mingo* is mounted on an insect pin. Mr. Edwards writes me that it was certainly collected in Kanawha County, West Virginia. It is very singular that, since W. H. Edwards wrote his original descriptions, not a single specimen of this insect has turned up in the United States, so far as can be ascertained. I should not hesitate to say that by some accident the insects in the Newman collection had been mislabelled, and that this exceedingly common Oriental butterfly had been inadvertently allowed to become mixed up with a lot of "stuff" from Colorado. The only difficulty arises from the positive statement of Mr. Edwards that the type of *mingo* was taken in West Virginia. I dislike to think him mistaken, but until we obtain more specimens from somewhere within the bounds of the United States I shall be inclined to believe that *omaha* (= *mingo* = *maesoides*) is not an American species, but belongs to the Indo-malayan fauna.

#### GENUS PARNARA Moore.

142. **P. mathias** (Fabricius), *Ent. Syst.*, Suppl. p. 433 (1798).

A few specimens.

143. **P. philippina** (Herrich-Schaeffer), *Prod. Syst., Lep.* III. p. 81 (1869).

A good lot of specimens, mostly *males*.

#### GENUS HASORA Moore.

144. **H. celaeus** (Cramer), *Pap. Ex.* IV. t. 393. f. A. B (1782).

Numerous specimens, principally *males*.

145. **H. thridas** (Boisduval), *Voy. Astrol., Lep.* p. 161 (1832).

This species is very near to *H. celaeus* (Cramer), and is only distinguished from it by the lighter blue-green colour of the underside of the wings, and the bright buff of the body on the lowerside.

146. **H. doleschalli** (Felder), *Sitzber. Ak. Wissensch. Wien, Math. Nat. Cl.*

XL. p. 460 (1860).

A few good specimens.

147. *H. chromus* (Cramer), *Pap. Ec.* III. t. 284. f. E (1782).

The specimens before me are all of the form described by Felder under the name *malayana*, with the white line or band on the underside of the secondaries narrow, or obsolescent.

148. *H. proximata* (Staudinger), *Iris* II. p. 137 (1889).

A single pair.

149. (?) *H. hurama* (Butler), *Trans. Ent. Soc. Lond.* p. 498 (1870);  
id., *Lep. Exot.* p. 166. t. 59. f. 10 (1873).

It is with some doubt that I identify the specimens before me with Dr. Butler's species. The white band on the underside of the secondaries is much narrower than in the specimens he figures, and the black spot at the anal angle is almost entirely wanting. Otherwise the specimens agree very well with his description and figure.

## DESCRIPTIONS OF NEW SPECIES OF BUTTERFLIES

CAPTURED BY MR. A. S. MEEK, AT MILNE BAY, BRITISH NEW GUINEA, IN THE MUSEUM OF THE HON. WALTER ROTHSCHILD, AT TRING.

By H. GROSE-SMITH, B.A., F.E.S., F.Z.S., ETC.

### 1. *Delias xelianthe* sp. nov.

♂. *Upperside*: both wings white. Anterior wings with the costal margin narrowly black, and the apex and outer margin more narrowly black than in *D. callistrate*, Gr.-Sm.,<sup>2</sup> but not dusted with grey scales as in that species: two subapical white streaks in the black area. Posterior wings, with the outer margin from the anal angle to a little above the discoidal nervule black, rather more narrowly so than in *D. callistrate*, and the inner edge of the black area more sharply defined than in that species.

*Underside*: anterior wings, with the costa, apex and outer margin much more narrowly black than in *D. callistrate*, with a row of spots in the black area, of which the three uppermost are pale yellow, and the others white. Posterior wings, with the basal third pale yellow, the black band as on the upperside, but much narrower than the black band of *D. callistrate*, a row of lunular spots in the black band, but four only in number, and more orange in colour.

♀. *Upperside*: both wings differ from the same sex of *D. callistrate* in being whiter and the dark areas blacker; the upper part of the black area on the anterior wings towards the apex does not approach so closely to the cell, and on the posterior wings the inner edge of the dark area is less curved.

*Underside*: both wings with the dark areas much blacker. On the anterior wings the subapical spots are yellow and white as in the *male*, instead of all yellow as in *D. callistrate*, and on the posterior wings the outer half is black with a submarginal row of narrow orange lunules extending from the apex to the anal angle, of which the second and third from the apex are almost obsolete; the basal third is pale



yellow. In *D. callistrata* only the outer fourth of the posterior wings is greyish black, and the submarginal lunules are yellow, broader and nearly uniform in size, the basal three-fourths of the wings being yellow.

Expanse of wings : 50 mm.

## 2. *Delias iere* sp. nov.

♂. *Upperside* : closely resembles *D. xelianne*, but the inner edge of the black areas on both wings is less regular, being indented between the veins, especially on the posterior wings.

*Underside* : anterior wings as in *D. xelianne*, but tinged with yellow towards the base. Posterior wings bright yellow, becoming paler towards the apex, where there are two submarginal orange spots forming a continuation of the row of orange lunules in the black outer-marginal area.

♀. *Upperside* rather yellowish white, with the outer-marginal black areas considerably narrower than in *D. xelianne*, and indented on the inner edges. On the *underside* the outer-marginal black areas are also much narrower, and on the posterior wings the basal three-fourths is yellow, shading to whitish towards the apex.

Expanse of wings : 56 mm.

## 3. *Delias zarate* sp. nov.

♂. *Upperside* differs from *D. gabia* Boisd., in both wings being more yellowish white. On the anterior wings the costal and apical areas are blacker, and the black outer-marginal area extends rather broadly to the inner margin. On the posterior wings the outer black band is wider.

*Underside* : anterior wings scarcely differ from those of *D. gabia* ; on the posterior wings the marginal black band is wider at the apex, and in it there is a row of narrow indistinct orange lunules ; the basal three-fourths of the wings is rather brighter orange yellow.

♀. *Upperside* with the marginal black bands of both wings wider than in *D. gabia*, and there are no pale spots in the black area towards the apex of the anterior wings.

*Underside* : differs little from the same sex of *D. gabia*, but the subapical spots in the black area of the anterior wings are all orange, and the row of orange lunules in the outer-marginal black area of the posterior wings is narrower.

Expanse of wings : ♂, 50 mm. ; ♀, 56 mm.

The shape of the wings of both sexes differs from *D. gabia*, being less produced at the apex of the anterior wings, and broader in the posterior wings.

## 4. *Mycalesis valeria* sp. nov.

♂. *Upperside* : blackish brown : anterior wings with two black spots on the disc, centred by a white dot, one before the apex, the other between the two lowest median nervules; the white band which crosses the disc, on the underside, is faintly visible through the wings. Posterior wings with the disc crossed from the middle of the costal margin to the lowest median nervule by a broad transverse white band which is widest on the costa and somewhat narrower at its termination, below which on either side of the lowest median nervule are two black spots centred by a white dot.

*Underside* : closely resembles *M. barbara* Gr.-Sm., but on the anterior wings the white band across the disc is rather narrower, and on the posterior wings is rather broader : on the posterior wings the spots in the discal row of ocelli are larger, and those on either side of the lowest median nervule are surrounded by broad orange rings.

♀. *Upperside* : paler than the *male*; anterior wings with a broad white band which crosses the middle of the disc from the upper median nervule, where it is narrowest, to the inner margin where it is broadest, dusted with brown scales between the median nervules : the two discal spots as in the *male*. Posterior wings with the white band as in the *male*, but wider and more diffused and extending down to the spots on either side of the lowest median nervule, where it becomes tawny and confluent with the orange rings round the last-named spots.

*Underside* : as in the *male*, but the white bands are broader, and the spots in the middle of the row of ocelli crossing the disc are nearly obsolete.

Expanse of wings : ♂, 44 mm. ; ♀, 50 mm.

A very beautiful insect; on the underside it closely resembles *M. barbara*.

#### 5. *Hypochrysops alix* sp. nov.

♂. *Upperside* : both wings resemble *H. theon* Feld., but darker blue ; on the anterior wings the apical area is less broadly black, and the pale area along the lower side of the cell is nearly obsolete ; on the posterior wings the costal area is grey instead of white.

*Underside* : anterior wings with the pale area more restricted and more sordid white, the outer margin more broadly brownish grey ; the metallic markings along the costa nearly obsolete, and restricted to two parallel metallic streaks on either side of the cell, and an indication of the prolongation of the same as a double row from the ends of the subcostal and median nervures to near the outer margin : a submarginal row of metallic spots along the outer margin. On the posterior wings the white horizontal band before the middle is narrower, the black bars on the disc are broader, and the metallic scales which occupy the interspaces are green instead of blue as in *H. theon*.

Expanse of wings : 36 mm.

#### 6. *Hypochrysops rufinus* Gr.-Sm.

♀. *Upperside* : both wings rufous brown, except the outer half of the posterior wings, which is bright fulvous.

*Underside* : as in the *male*.

Expanse of wings : 23 mm.

I may be wrong in describing this insect as the *female* of *H. rufinus* Gr.-Sm. The specimen is much rubbed on the underside, and I have had difficulty in comparing the spots and markings. It may be proved hereafter to be a distinct species.

#### 7. *Hypochrysops cleon* sp. nov.

♀. *Upperside* : anterior wings brownish grey, with the base, lower part of the cell, the area at the base of the median nervules, and below them to the inner margin, pale iridescent blue. Posterior wings duller brownish grey, with the basal half pale iridescent blue.

*Underside* : anterior wings pale cinereous brown with a dark patch extending over the middle of the disc ; the cell costal area to the apex, and thence broadly along the outer margin, and a row of spots in the dark patch, ochreous, two streaks along the costa, another in the middle of the cell curving downwards at its outer end, a bar at the end of the cell, several subcostal spots, and a submarginal row of spots all metallic bluish green, two dark spots below the cell on either side of the lowest median nervule, the outer one centred by ochreous ; a whitish triangular spot before the apex. Posterior wings with the shoulder and six bars crossing the wings bright rufous, a marginal band paler rufous, a streak below the shoulder, and the rufous bars bordered by metallic bluish green ; the sixth rufous bar is bordered broadly on either side by metallic bars, also bluish green ; the disc is darker in the middle than the rest of the wings ; two spots above the fifth rufous bar (which is shorter than the other bars) and a space beyond it is pale pinkish white ; the cilia at the ends of the veins are barred by brown, between which they are pale grey.

Expanse of wings : 28 mm.

#### 8. *Hypochrysops cleonides* sp. nov.

♀. *Upperside* : closely resembles *H. cleon*, but both wings are duller grey, and the basal blue is likewise duller.

*Underside* : differs from *H. cleon* on the anterior wings in being paler, and there is only one black spot below the cell, situate above the junction of the lowest median nervule. Posterior wings with markings similar to those in *H. cleon*, but the fifth bar is bordered outwardly by a metallic line, which is not the case in *H. cleon*, while the broad metallic band which borders inwardly the sixth rufous band of *H. cleon* is absent ; the discal area is not darker in the middle, as in *H. cleon*, and the area between the fifth and sixth bars, which is pinkish white in *H. cleon*, is the same colour as the ground colour of the rest of the wings. There is no trace of the cilia being crossed by brown at the ends of the veins.

Expanse of wings : 33 mm.

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# NEW GENERA AND SPECIES OF *THYRIDIDAE* AND *GEOMETRIDAE* FROM AFRICA.

BY W. WARREN, M.A., F.E.S.

## FAMILY *THYRIDIDAE*.

### 1. *Dysodia fenestratella* sp. nov.

*Forewings*: olive-drab; the markings olive fuscous; the costa with four dark marks, one near base, one before and beyond the middle, the fourth before apex; from the inner side of the last a thick olive fuscous band runs parallel to the hindmargin as far as vein 2, where it is joined by a shorter band from the subcostal vein, the two forming a V-shaped mark; above and below the median vein on the inner side of the V are two small round hyaline spots, the upper one within the cell; beyond the outer arm are three similar spots in the spaces between veins 2 and 5; below vein 2 the V-shaped mark swells out into an inverted funnel-shaped mark resting on the inner margin; beyond the three outer hyaline spots are several smaller pale spots mixed with dark scale patches ending in a larger patch at anal angle; from the outer arm of the V below the costa a curved dark streak runs to middle of hindmargin: fringe olive fuscous; all the veins pale.

*Hindwings*: with a large anvil-shaped hyaline blotch, round which are collected an irregular lot of small round hyaline spots alternating with dark olive patches; marginal area paler, without spots.

Underside mottled with greenish grey and olive fuscous; the V-shaped mark of forewings dark and very conspicuous. Head, thorax, and abdomen like ground colour of wings.

Expanse of wings: 21 mm.

One ♂ from the west side of the Luitpold Mountains, near Ikutha, British East Africa.

The costa of forewings is incurved in middle: hindmargin of both wings bulged at vein 3, in the hindwings indented beyond cell.

## FAMILY *GEOMETRIDAE*.

### SUBFAMILY *GEOMETRINAE*.

#### *Lathochlora* gen. nov.

*Forewings*: with costa curved throughout, more strongly arched at base; apex prominent, blunt; hindmargin somewhat irregularly concave from apex to vein 3, then sharply oblique.

*Hindwings*: bluntly angled at vein 4, and elbowed at vein 6, concave between.

Palpi moderate, the terminal joint drooping; tongue present; frenulum absent; antennae short and thick, suberrate, with close clavate teeth, rasped above.

*Neuration*: forewings, cell broad, about one-third of wing; discocellular shortly concave above, then oblique and faint; first median nervule at two-thirds, second and third from lower angle of cell; lower radial from the bend in the discocellular,

upper from upper angle of cell; the five subcostals stalked, 11 anastomosing strongly with 12. Hindwings: with 3, 4, and 6, 7 stalked.

Type: *Lathochlora inornata* sp. nov.

The genus is certainly allied to *Halophanes* Warr. from India, but sufficiently distinct.

## 2. *Lathochlora inornata* sp. nov.

*Forewings*: dull greyish green, with an indistinct pale curved space at one-third, and another at four-fifths, this last becoming whitish on inner margin before anal angle; fringe somewhat paler.

*Hindwings*: with outer curved space only: the basal area pale, subhyaline.

Underside similar, but paler, the markings more diffuse. Head, thorax, and abdomen pale green; antennae ochreous.

Expanse of wings: 25 mm.

One ♀ from Warri, Niger Coast Protectorate, May 1897 (Dr. Roth).

## SUBFAMILY STERRHINAE.

### 3. *Craspedia planipennis* sp. nov.

*Forewings*: bone-colour, obscurely powdered or discoloured with ochreous; the costal edge at base brownish; in certain lights three faintly darker waved lines can be detected, inner, median and outer, the last the plainest; slight brownish marginal dots, often effaced; fringe concolorous; no cellspot.

*Hindwings*: similar: with an obscure brownish cell dot.

Underside pale, unmarked; the costa of forewings yellowish. Face and palpi above dark brown; vertex, thorax, and abdomen bone-colour.

Expanse of wings: 26 mm.

One ♂ from Sierra Leone.

Forewings with apex rounded: hindwings with hindmargin well rounded, the anal angle almost lobed.

### 4. *Craspedia rufinubes* sp. nov.

*Forewings*: bone-colour, hardly speckled; first and second lines indistinct, at one-third and one-half of costa, both angled outwards, in cell and on vein 6, then oblique inwards to one-fourth and beyond middle of inner margin respectively: exterior line red brown and fine at three-fourths, shaped as in *addictaria* Wlk., followed except at costa by a lunulate purplish grey band, which is fringed with rufous and darker beyond cell and above anal angle; submarginal line waved, followed by a marginal rufous fuscous band, finely edged with white before the black festooned marginal line; fringe bone-colour, tinged with rufous and grey; apical pale space with a patch of black-and-white scales; cellspot black, placed in an indistinct grey annulus, which is sometimes faint.

*Hindwings*: with the cellspot placed in a large grey loop formed by the median line; outer line and submarginal shades rufous grey, less pronounced than in forewings.

Underside with the lines and markings grey. Face and palpi above black brown; vertex, thorax, and abdomen concolorous with wings.

Expanse of wings 22—24 mm.

Three ♂♂ from Unyoro; two from Warringo River, August and December 1897, one from Ulumb, January 1898 (Dr. Anson).



5. *Eois macrostyla* sp. nov.

*Forewings*: ochreous, tinged with yellowish, and dusted with fuscous; costa brownish fuscous at base; the lines brown; first at one-fourth, well marked on costa, below which it is bent: outer line at three-fourths, bluntly angled outwards on vein 6, then oblique to inner margin at three-fourths; median shade indistinct; submarginal line pale, between ochraceous shades; fringe glossy ochreous, with rather large dark spots at the base beyond the edge of the wing.

*Hindwings*: with the outer line sinuous, and a slight cellspot.

Underside more strongly tinged with yellowish, and more coarsely speckled with blackish; the lines darker. Thorax and abdomen ochraceous; vertex pale, face and palpi dark brown.

Expanse of wings: 10 mm.

One ♂ from the west side of the Luitpold Mountains, near Ikutha, British East Africa.

I have not been able to denude the unique specimen, but as far as can be made out, veins 6, 7 of the hindwings separate just before the hindmargin.

6. *Eois sublimbaria* sp. nov.

*Forewings*: bone-colour, roughly freckled with pale greyish or brownish scales; costa marked with indistinct purplish grey dashes, denoting the origin of the lines: these are scarcely traceable, but appear to run all parallel to the bindmargin, which is preceded by purplish grey scales, most prominent beyond the cell; fringe concolorous, chequered with purplish grey; no cellspot.

*Hindwings*: with the dark marginal scales more prominent.

Underside similar. Face purplish brown; vertex, thorax, and abdomen concolorous with wings.

Expanse of wings: 14 mm.

One ♂ from South Africa.

7. *Induna curvimargo* sp. nov.

*Forewings*: bone-colour, faintly powdered with darker; first and second lines ochraceous, diffuse; first at one-fifth, angled in cell; second from just beyond one-half, angled on vein 6, to middle of inner margin; third line brown, fine and concise, rounded at vein 6, then sinuous to three-fourths of inner margin, followed by an ochraceous shade with lunulate outer edge, stopping short at vein 6, below which it is darkest; shade beyond submarginal line hardly expressed; marginal line brown, containing darker dots between the veins in upper half of wing; fringe bone-colour, tinged with ochraceous; cellspot black.

*Hindwings*: without first line; the shade beyond outer line fainter.

Underside bone-colour, speckled with pale brown; cellspots and outer line only plain. Face and palpi brown; vertex, thorax, and abdomen like wings.

Expanse of wings: 22 mm.

One ♂ from Mpeta, Loangwa River, affluent of the Zambesi, November and December 1895, the beginning of the rainy season (Coryndon).

Very near to *Induna albida* Warr. from Usuga; but the hindmargin of both wings bent in the middle, in the hindwings strongly; hind-tibiae without pencil of hairs and without spurs; tarsi as long as tibiae.

8. *Isoplenia albivertex* sp. nov.

*Forewings*: pale ochreous, varied with rufous scales, as far as the second line, and densest at base; lines rufous; first at one-third, curved; second at two-thirds, denticulate outwards on the veins, the teeth of veins 3, 4, and 6 prominent; third line at five-sixths, parallel throughout to second, followed by a lunulate reddish fascia; marginal line thick, red, swollen along the veins, which are also red beyond third line; fringe reddish; cellspot linear, reddish.

*Hindwings*: similar; the third line not so near the hindmargin, and the submarginal fascia not so distinct.

Underside pale ochreous, with the outer and marginal lines only.

Face and palpi reddish; antennae and vertex pure white; thorax and abdomen ochreous, much suffused with rufous.

Expanse of wings: ♂ 30 mm.

One ♂ from Anderson River, Natal.

Differs from the type species *I. trisinuata* in having the vertex and antennae pure white instead of red; and the antennae are fully and obliquely pectinated.

9. *Ptychopoda basicostalis* sp. nov.

*Forewings*: bone-colour dusted with grey, and tinged in places with ochreous; costa brown from base to first line; first line brown, at one-third of costa, below which it is angulated and then runs obliquely to one-fourth of inner margin; outer line from three-fourths of costa to three-fourths of inner margin, inwardly oblique and dark brown at costa, bent outwards at vein 6 and inwards on submedian fold, irregularly waved between. Cellspot large, black, with an indistinct ochraceous middle shade through it; two indistinct submarginal ochraceous shades.

*Hindwings*: with large black cellspot, and indistinct curved postmedian and submarginal lines.

Underside with cellspot and outer line very distinct.

Face, collar, and front of shoulders brown; vertex, thorax, and abdomen like wings.

Expanse of wings: 13 mm.

One ♂ from South Africa.

The hindmargin of hindwings is bulged at middle; hindlegs wanting.

10. *Ptychopoda squamulata* sp. nov.

*Forewings*: brownish-ochreous, the speckling and lines purplish fuscous; basal half of costa fuscous; inner line from two-fifths of costa and median obliquely curved inwards and parallel as far as the median vein, where the median line becomes divergent; within the inner line and near it is another less distinct; outer line sinuous, at four-fifths, followed by a sinuous purplish grey shade, which is partially obsolescent towards costa and is edged by the submarginal line beyond which is another grey shade; cellspot fuscous; fringe concolorous with wings, with a median line formed of dots of blackish scales beyond the vein ends.

*Hindwings*: with no inner lines; the purplish grey shade beyond outer line narrower.

Underside with basal and marginal areas speckled with fuscous, the space

between median and outer lines in both wings clearer. Face and palpi purplish fuscous; thorax, vertex, and abdomen concolorous with wings.

Expanse of wings : 14 mm.

One ♂ from Weenen, Natal.

Though different in markings, it is possible this may be a form of *Pt. excilinata* Warr., also from Weenen.

#### 11. *Sterrrha griseolineata* sp. nov.

Closely allied to *Sterrrha punctilineata* Warr., Nov. Zool. IV. p. 63, from Weenen, Natal, but with all the lines and shading fuscous grey, not ochreous. The difference is more particularly noticeable on the underside.

Expanse of wings : 17 mm.—21 mm.

Two ♂♂ from Howick, Natal.

### SUBFAMILY ASTHENINAE.

#### *Leucoxena* gen. nov.

*Forewings* : narrow and elongate; costa curved only at base and before apex; hindmargin oblique, hardly curved; anal angle rounded off.

*Hindwings* : elongate; hindmargin curved and slightly elbowed at vein 4. Antennae of ♂ bipectinated. The pectinations ciliated; palpi porrect, hairy, terminal joint short; hind-tibiae without spurs; tongue and frenulum present.

*Neuration* : forewings, cell half as long as wing; discocellular vertical; first median at two-thirds, second at seven-eighths; radials normal; 7, 8, 9, stalked from well before end of cell; 10 and 11 stalked, 10 anastomosing with 7, 8, 9. Hindwings with costal anastomosing with subcostal for only one-third of cell; veins 7 and 8 stalked; medians as in forewings; radial from centre of discocellular.

Type : *Leucoxena lactea*, sp. nov.

#### 12. *Leucoxena lactea* sp. nov.

*Forewings* : creamy white, finely dusted with fuscous atoms; two faint ochreous streaks from inner margin parallel to hindmargin, at one-third, and one-half, both obsolescent above the median vein; an oblique straight fuscous line from before apex to two-thirds of inner margin and an indistinct submarginal shade; marginal line fine, black, swollen into spots between the veins; fringe concolorous.

*Hindwings* : less dusted, with the two outer lines only.

Underside with costal area of forewings and marginal area of both wings beyond outer lines tinged with grey. Head, thorax, and abdomen white; shaft of antennae white, the joints and pectinations fuscous.

Expanse of wings : 22 mm.

One ♂ from the west side of Unipold Mountains near Ikutha, British East Africa.

### SUBFAMILY DEILINIINAE.

#### 13. *Parasynegia rufigrisea* sp. nov.

*Forewings* : dull lilac grey, speckled and suffused with vinous red; the costa strigulated with fuscous; a diffuse reddish patch at base, its outer edge curved and

projecting in cell; central fascia narrow, with sinuous edges; inner edge from just before middle of costa to before middle of inner margin, outer edge at two-thirds; the edges parallel, outcurved above and incurved below middle; dentate-lunulate, the outer more regular than the inner; the inner shaded outwardly and the outer inwardly, with red, the lunules of the outer finely margined with grey; submarginal line grey, lunulate, preceded and followed by vinous red, and broadly interrupted between veins 4 and 6 by a lilac grey patch which extends to hindmargin, the apex also remaining grey; marginal spots dark red brown; fringe reddish-grey.

*Hindwings*: similar, the central fascia more filled up with red and narrowed towards inner margin, the cellspot linear, pale grey, with red edges.

Underside dull grey, tinged with red, the markings indistinct. Head, thorax, and abdomen lilac-grey tinged with red; the face, palpi, and shoulders red.

Expanse of wings: 44 mm.

One ♀ from Old Calabar. Differing in colouration and markings from all the Indian species of the genus, but agreeing in venation except that the cell is shorter.

#### SUBFAMILY ASCOTINAE.

##### 14. *Alcis argillacea* sp. nov.

*Forewings*: straw colour, tinged in places with ochraceous, and speckled irregularly with brown; the lines brownish; first from one-fourth of costa to one-third of inner margin, bent in cell; second, median, from costa beyond middle to middle of inner margin, sinuous and regularly dentate; outer line from three-fourths of costa to inner margin close beyond median line, regularly dentate, followed by a dentate-lunulate shade which between veins 3 and 5 forms a large cloudy blotch; submarginal indistinct, preceded by darker lunules of which one below costa and two beyond cell are very conspicuous; cellspot and marginal spots large and brown-black; fringe concolorous.

*Hindwings*: similar, without first line.

Underside like upper. Head, thorax, and abdomen (damaged) like wings.

Expanse of wings: 52 mm.

One ♂ from the Kassai country, Congo Free State, 1898.

The single example is unluckily worn. Guenér's *emunctaria* from "Abyssinia" expands only 40 mm., while Walker's *ricaria* from South Africa, which corresponds in point of size, is greyish fawn-colour. In the forewings veins 10 and 11 are short-stalked; the palpi are well developed, the third joint being fine and distinct, half as long as the second.

#### SUBFAMILY SEMIOTHISINAE.

##### 15. *Gonodela siennata* sp. nov.

*Forewings*: whitish, with coarse olive fuscous spots and striae; costal area fuscous, the costal edge itself rather deep ochreous, marked with black spots; the three lines starting from black spots; first at one-fifth, second before middle, third at two-thirds; the first angled in cell, then oblique inward; second angled on vein 6, then oblique, touching lower end of the oblique cellspot, and preceded on inner margin by a thick fuscous line; outer line fine, double, subsinuate, black with a lustrous grey line in the middle, followed by an irregularly dentate pale sienna brown fascia, speckled with black; marginal area purplish grey, with slight whitish spot towards apex; marginal line dark; fringe grey, with whitish base.



*Hindwings* : with a black spot at base; a diffuse straight fuscous shade before middle, arched before the black cellspot; a double black straight postmedian line with a lustrous grey line between; marginal area as in forewings, with a pale triangular patch below median.

Underside with costa of both wings yellowish; the brown submarginal fascia broader; head and collar yellowish ochreous speckled with blackish; thorax and abdomen cinereous.

Expanse of wings : 38 mm.

One ♂ from Warri, Niger Coast Protectorate, May 1897 (Dr. Roth).

### **Platypepla** gen. nov.

*Forewings* : short and broad; costa straight for the first half, then strongly convex; apex blunt, slightly produced; hindmargin faintly sinuous; anal angle rounded.

*Hindwings* : ample; the hindmargin very fully rounded.

Palpi short, thick, not reaching beyond forehead, terminal joint minute; antennae long, subserrate-ciliate; tongue and frenulum present; legs rather stout; hind-tibiae with four spurs; forewings with fovea.

*Neuration* : forewings, cell fully half as long as wing, the extremities convergent; discocellular vertical; first median at five-eighths, second at seven-eighths; radials normal; 7, 8, 9, stalked from well before end of cell; 10 and 11 coincident, anastomosing with 12; submedian vein slightly bulged at base beneath the fovea.

*Hindwings* : costal approximated to subcostal for half of cell; vein 7 well before end of cell; medians as in forewings; no radial.

Type *Platypepla nudaria*, sp. nov.

Closely approximating in structure to *Semiothisa*.

### 16. **Platypepla nudaria** sp. nov.

*Forewings* : pale fulvous ochreous, rather deeper tinged at base and along hindmargin; costa speckled with brownish fuscous; a small dark spot on costa near base, and an oblique dark streak at one-third, suggesting the commencement of basal and inner lines; traces of a postmedian line; cellspot black, distinct; fringe concolorous.

*Hindwings* : with black cellspot and traces of postmedian curved line on inner margin.

Underside yellower speckled with brown; cellspots and postmedian line of hindwings only visible. Head, thorax, and abdomen concolorous with wings; palpi brown above.

Expanse of wings: 22 mm.

One ♂ from South Africa, without more precise locality.

The insect is not fresh, but does not appear to have ever had distinct lines or markings. It bears some superficial resemblance to the Lithosid genus *Nudaria*.

### SUBFAMILY FIDONINAE.

### 17. **Fidonia acuta** sp. nov.

*Forewings* : rufous ochreous, with transverse brown striae, the costa dotted with fuscous; hindmarginal area deeper-tinted, towards anal angle becoming violet



grey. Marginal line formed of black dashes between the veins; fringe concolorous.

*Hindwings* : with the whole hindmargin narrowly violet grey.

Underside paler, dusted with rufous. Head, thorax, and abdomen concolorous.

Expanse of wings : 22 mm.

One ♂ from the Cape of Good Hope (Felder Coll.).

The forewings have the apex produced and subacute; the palpi are long and rostriform.

#### SUBFAMILY ENNOMINAE.

##### *Pareclipsis punctata* sp. nov.

*Forewings* : pale reddish fawn-colour, densely but finely black speckled; the lines marked by black spots on the veins; first slightly curved at one-fourth; second from five-sixths of costa below which it is slightly outcurved, oblique to three-fourths of inner margin, where it becomes obscurely double; a slight oblique dark shade from apex; marginal spots black; cellspot large, black; fringe concolorous.

*Hindwings* : with a double postmedian line, the outer one dotted on the veins; a very faint trace of a submarginal line; marginal spots scarcely visible.

Underside, with blackish cellspots and an outer line of spots on veins, that in the hindwings being submarginal. Head, thorax, and abdomen concolorous.

Expanse of wings : 30 mm.

1 ♀ from Howick, Natal, Oct. 1891.

The apex of forewings minutely produced; hindmargin sinuous, rounded, not elbowed, in the middle. Veins 7, 8, 9, stalked; 10 and 11 free.

#### PHRUDOCHORDA Warr., Nov. Zool. V. p. 254.

The genus was described from a ♂, in which sex vein 7 is missing; but I find that in the ♀ the neurulation is complete, vein 7 being stalked with 8, 9. The antennae of the ♀ are bipectinate as in the ♂, the pectinations shorter and more delicate. The specimen, which belongs to the type species *fuscimargo*, was taken at Howick, Natal, in October 1891.

#### SUBFAMILY PROSOPLOPHINAE.

##### *Pachypalpia* gen. nov.

*Forewings* : elongate; costa nearly straight; apex blunt; hindmargin obliquely curved; anal angle slight.

*Hindwings* : narrow; inner margin short; hindmargin subcrenulate, strongly rounded above, nearly straight from anal angle to middle.

Palpi porrect, stout and hairy, first joint distinct, second broad and expanded, hiding the third joint; antennae of ♂ stoutly bipectinate, of ♀ simple; tongue slightly developed; frenulum present; hind-tibiae swollen, with four spurs.

*Neurulation* : forewing, cell half of wing; discocellular, vertical; first median at four-fifths, second close to third; radials normal; veins 7, 8, 9, stalked; 10 and 11 coincident, anastomosing very strongly with 8, 9, and both separating shortly before costa; hindwing: costal approximated to subcostal for half of cell; vein 7 from close before angle; no radial.

Type : *Pachypalpia subalbata* sp. nov.

**Pachypalpia subalbata** sp. nov.

*Forewings* : pale grey, darker along inner and hindmargins ; lines ill defined, but well marked by dark costal spots : first from one-fourth of costa to near base of inner margin, with darker spots on the veins ; second, median, from beyond middle of costa to before middle of inner margin, followed by a largish cellspot ; third from three-fourths of costa to just beyond middle of inner margin, marked by dark veinspots, and forming a sinus inwards beyond cell and on submedian fold ; no spots on radial and submedian fold ; submarginal pale, indistinctly waved, preceded by a lunulate oblique shade : marginal line dark : fringe whitish, with distinct dark marks beyond the veins.

*Hindwings* : with distinct dark marginal border : dark antemedian and dotted postmedian, nearly straight, lines : cellspot small.

Underside : white, speckled with fuscous ; both wings with dark marginal border, interrupted below middle and more distinct in hindwings ; cellspots present, but no lines. Head, thorax, and abdomen whitish, speckled with fuscous : face and palpi more varied with fuscous.

Expanse of wings : 39 mm.

A pair from the west side of Luitpold Mountains, near Ikutha, British East Africa.

NEW GENERA AND SPECIES OF *DREPANULIDAE*,  
*THYRIDIDAE*, *EPIPLEMIDAE*, AND *GEOMETRIDAE*.

FROM THE INDO-AUSTRALIAN AND PALAEARCTIC REGIONS.

By W. WARREN, M.A., F.E.S.

FAMILY DREPANULIDAE.

1. *Gogana integra* sp. nov.

*Forewings* : pale mouse-colour, dusted with darker, with traces of a dark central and double submarginal fascia, marked with dark brown and ferruginous ; fringe with dark spots beyond the veins : no hyaline patch beyond cell.

*Hindwings* : without any markings.

Underside duller : head, thorax, and abdomen concolorous ; face and palpi dark brown.

Expanse of wings : 26 mm.

One ♂ from Government Hill, Penang, 1,000 feet, May 1898 (Curtis).

In forewings the costa is very strongly protuberant near base, and the hindmargin produced in middle into a prominent triangle.

2. *Gonocilix renifera* sp. nov.

*Forewings* : white, with a large, slightly oblique, kidney-shaped blotch of ochreous and grey scales just before middle of inner margin, reaching to upper margin of cell and extending beyond it between veins 4 and 6, its origin represented by a small grey spot on costa at about one-third, and followed between veins 2 and 4

by a clear hyaline patch: outer line from costa before two-thirds, oblique outwards and ochreous as far as vein 5, then lunulate inwards and grey, parallel to hindmargin, the lunule between veins 4 and 5 filled up with black; submarginal line white, lunulate-dentate, preceded and followed by ochreous grey bands, more or less broken up into patches by the paler veins and not extending beyond vein 6, the apical area remaining pure white; the outer band shaded with brown and fulvous scales, especially between veins 6 and 3; fringe white with small black marginal dots at the ends of the veins: the discocellular marked with bright silvery scales.

*Hindwings*: with an obscure curved grey cloud near base: the centre of wing occupied by a hyaline space in which the silvery discocellular is conspicuous; a submarginal undulating white line with a grey band preceding and following it; marginal dots and fringe as in forewings.

Underside with base of costa of forewings smoky fuscous; a broad smoky fuscous central fascia not reaching costa and connected beyond cell with a darker submarginal funnel-shaped fascia; hindwing with costa near base and a subapical fascia grey; face brown-black, with the lower margin white; vertex, thorax, and abdomen white.

Expanse of wings: 28 mm.

One ♀ from Gunung Ijan, Perak, March 1898 (Butler).

The single specimen is unfortunately much worn. It agrees in venuration with the type species, except that vein 6 rises from the upper end of cell and not from the areole, and the upper part of discocellular is concave merely, not invagulated.

### 3. *Oreta pusilla* sp. nov.

*Forewings*: pale yellow; a rufous spot in cell towards base, and a rufous cloud before lower end; a fine oblique rufous line from apex to three-fourths of inner margin: three wedge-shaped red-brown spots before middle of hindmargin on veins 2, 3, and 4; fringe yellow, slightly rufous tinged.

*Hindwings*: with the rufous line just beyond the middle, and with an antemedian rufous line, visible only towards inner margin.

Underside: yellow, forewings with costa at base rufous and a rufous cloud along middle of hindmargin including the three brown spots.

Face and legs deep crimson: vertex, collar, and patagia rufous fulvous; shoulders and abdomen yellowish.

Expanse of wings: 24 mm.

One ♂ from Yeppoon, Queensland, October 1890, from the Barnard Collection.

The apex of forewing is hardly produced; the hindmargin oblique and straight. In the forewings 6, 7, 8, 9, 10, are stalked, 11 free; 9 and 10 long stalked; 6 out of 7, 8.

Akin to *O. fascimargo* Warr., from Queensland.

### 4. *Oreta roseola* sp. nov.

*Forewings*: uniform pale flesh-colour; a darker oblique line from costa just before apex to two-thirds of inner margin; a patch of whitish, black-speckled scales in the apex, and two blackish, white-edged lunules on veins 2 and 3 before the hindmargin; fringe concolorous.

*Hindwings*: with antemedian and postmedian parallel darker lines, neither reaching the costa.

Underside paler; forewings with a grey cloud along hindmargin.

Face dull deep red; the legs rosy; thorax and abdomen like wings; shoulders and antennae whitish.

Expanse of wings : 30 mm.

One ♀ from Dawson District, Queensland, from the Barnard Collection.

The forewings are elongate, the apex only slightly and bluntly produced, the hindmargin sinuous, being faintly elbowed above vein 3. In the forewings only 7, 8, 9, 10 are stalked together, 6 rising from the same point; 9, 10 shortly separating from 7, 8, and coincident till near apex.

#### FAMILY THYRIDIDAE.

##### 5. *Dysodia bipuncta* sp. nov.

Nearest to *D. siculoidea* Feld. in appearance, but the ground colour more golden yellow and the markings brighter fulvous; in the hindwings there are two small white hyaline dots, one at each end of the discocellular; in *ignita* Wlk. there is only one dot, at the lower end, and the ground colour is redder; in *siculoidea* Feld. the hindwing is entirely without dots.

Expanse of wings: 35 mm.

One ♂ from Gunung Ijan, Perak, March 1898 (Butler).

##### 6. *Dysodia laevis* sp. nov.

*Forewings*: uniform smooth bright ferruginous, with a very few and obscure dark ramifying streaks, and an oblique olive fuscous band at three-fifths, widened on inner margin and in cell where it is angled: fringe slightly darker, with pale tips.

*Hindwings*: similar; with a large hyaline white cellspot, evenly curved towards base, bilobed externally, the upper lobe small.

Underside duller and paler: olive ochreous, suffused with dull brownish: the reticulations darker and more numerous. Thorax and abdomen bright reddish ferruginous; shoulders and head olive-brown; hair tufts of the legs reddish: the tarsi fuscous, with pale joints.

Expanse of wings: 32 mm.

Two ♂♂, 1 ♀ from the Khasia Hills and Sikkim; both sexes exactly alike. Distinguished from *fenestrata* Moore by the smoothness of the scaling and the different shape of the hyaline spot.

##### *Microctenucha* gen. nov.

*Forewings*: elongate; costa convex near base and before apex, slightly insinuate between; apex prominent; hindmargin curved.

*Hindwings*: costa convex in basal half; apex prominent; hindmargin curved. Antennae short, stoutly bipectinate in both sexes, more shortly in the ♀. Palpi horizontally porrect, pointed: forehead protuberant.

*Neuration*: forewings, cell more than half as long as wing; discocellular faint, nearly vertical: first median nervule at one-half, second well before end; lower radial a little above lower end of cell, upper from below upper end; vein 7 shortly stalked with 8, 9; 10 and 11 free.

Type: *M. munda* Hmps. (Rhodoneura).

The genus is related to *Camptocheilus* Hmps., and *Oxycoquina* Warr., agreeing with the latter in the pectinated antennae.

## FAMILY EPIPLEMIDAE.

7. *Epiplema basipuncta* sp. nov.

*Forewings* : dull whitish, with slight grey speckling and suffusion ; the two lines dark grey ; first from one-third of costa, bluntly angled outwards on the median vein, to inner margin before middle ; second from three-fifths of costa obliquely curved outwards to vein 4, then bluntly angled and inflected to vein 2, whence it again runs outwards to inner margin at two-thirds ; preceded in cell and on inner margin by a pale brown shading ; a dark curved line from before apex to vein 2 ; the hindmargin darker grey ; a dark interrupted marginal line ; fringe whitish, chequered with grey ; a black spot at base below the submedian vein.

*Hindwings* : with both lines ochreous and grey, acutely angled at vein 4 and conversely darker shaded ; marginal area pearl grey, slightly lustrous ; marginal line finely black ; a minute black dot with some shining pale scales before lower tooth.

Underside dull whitish. Face and palpi dark brown ; vertex, thorax, and abdomen whitish.

Expanse of wings : 17 mm.

1 ♂ from Waterfall Valley, Penang, March and April 1898 (Curtis).

Forewings with hindmargin slightly incurved below apex and bulging below middle ; hindwings with a sharp tooth at apex as well as at veins 4 and 7. In the hindwings the cell is very short, the wing-membrane puckered and semihyaline.

8. *Epiplema bellissima* sp. nov.

*Forewings* : pale lilac grey, obscurely freckled with darker ; the costa with short dark grey striae ; an oblique inner line from one-fourth of costa touching a ferruginous spot in cell, a dark obliquely bent line from just beyond middle of costa, edged on each side with ferruginous, stopping short at vein 4, and ending in a double upright dark mark on inner margin before anal angle ; hindmargin dark grey from apex to vein 3, limited inwardly by a straight brown-black line with ferruginous edges ; fringe grey with darker base, and traces of pale dots at the ends of veins.

*Hindwings* : with a bright chestnut streak along cell forming a wedge-shaped mark with the discocellular line which is also chestnut ; outer line chestnut, bluntly angled in middle, preceded by a bright chestnut suffusion, and followed by the same colour above middle with a lustrous blue line through it, the angle pale with black scales ; a dark grey curve between the teeth containing above vein 5 a pure white spot on hindmargin ; fringe dark grey ; all the veins in marginal half pale grey.

Underside pale blue-grey, with a few dark frecklings. Face and palpi black ; vertex, thorax, and abdomen pale whitish grey. Hindmargin of forewings entire ; of hindwings with a tooth at veins 4 and 7.

Expanse of wings : 23 mm.

One ♂ from Waterfall Valley, Penang, March and April 1898 (Curtis).

## FAMILY GEOMETRIDAE.

## SUBFAMILY OENOCHROMINAE.

9. *Dichromodes steropias* ab. *nexistriga* nov.

Differs from the type form (as described), in having a brown-black, irregularly sinuous streak from costa close to base to hindmargin a little below apex, passing



along the median vein and upcurved to the spot at end of cell, then straight to submarginal line and again oblique upwards to margin; the transverse lines, as described by Meyrick, are in this example more or less faint or obsolescent, while the veins beyond the middle are in places marked with blackish scales. The hindwings are wholly whitish.

One ♂ from Roebourne, West Australia.

Though I have not seen an example of typical *steropias* Meyr., I have little doubt that this insect is rightly referable to it, though the horizontal dark streak gives it a very abnormal appearance. Meyrick's three examples were all from West Australia.

#### SUBFAMILY GEOMETRINAE.

##### *Dithecodes* gen. nov.

*Forewings*: costa faintly curved throughout; hindmargin obliquely curved.

*Hindwings*: with a blunt but perceptible elbow at vein 4. Palpi short, porrect. Antennae (♀) lamellate, subdentate, pubescent: tongue and frenulum present; hind-tibiae with terminal spurs only.

*Neuration*: forewings, cell about half of wing; median and subcostal convergent towards end; discocellular vertical; first median just beyond middle, second well before end of cell; lower radial from a little above middle of discocellular; upper from top end of cell; 7, 8, 9, stalked; 10 and 11 from cell, 10 anastomosing with 11, and again with 8, 9, forming a double areole. Hindwings with costal touching subcostal near base; 6, 7 very short-stalked; medians as in forewings; radial from above middle of discocellular.

Type: *Dithecodes erasa* sp. nov.

The neuration is quite anomalous for this subfamily, vein 10 being usually stalked with 7, 8, 9; as it is also in all the genera of *Sterrhinae* which have a double areole.

##### 10. *Dithecodes erasa* sp. nov.

*Wings*: dull pale yellowish-green, with no visible markings.

Underside paler.

Head, thorax, and abdomen concolorous; face and tips of palpi black-brown.

Expanse of wings: 30 mm.

One ♀ from Japan, without further locality.

##### *Halophanes* gen. nov.

*Forewings*: with costa arched at base, then straight or nearly so till close before apex; apex blunt, rectangular; hindmargin somewhat incurved below apex, then strongly bowed, and below the middle very oblique to anal angle; inner margin very short, hardly more than half the costa.

*Hindwings*: irregularly kite-shaped, the costa short, as long as the inner margin of forewings; the inner margin longer; hindmargin with a prominent blunt tail at end of third median, and an elbow at end of second subcostal. Frenulum absent. Palpi very short; tongue present; antennae of ♂ pubescent, hardly ciliated; legs slender.

*Neuration*: cell barely one-third of wing; discocellular concave; first median close before angle of cell; second and third shortly stalked; lower radial from

above the centre of discocellular; upper radial and the five subcostals stalked, the first subcostal anastomosing with the costal. Hindwing with the two subcostals and last two medians shortly stalked. Sealing close and fine; structure delicate.

Type: *Halophanes xanthochlora* Swinh. (*Macates*).

#### SUBFAMILY STERRHINAE.

##### 11. *Arhostia indecorata* sp. nov.

*Forewings*: whitish ochreous, discoloured with fine pale brown or ochreous scales, the whole presenting a somewhat mealy appearance; the lines very indistinctly marked with pale brownish scales, the first curved, the median and exterior parallel to hindmargin, the latter waved, all three equidistant on inner margin; submarginal line almost obsolete; an obscure pale brown marginal line, most distinct between the veins; fringe concolorous; cellspot rather large, dull grey-brown.

*Hindwings*: the same, but without inner line, and the submarginal line more distinct.

Underside with the cellspots, outer and marginal lines marked; forewing tinged with grey towards costa and base. Face and palpi dark brown; vertex, thorax, and abdomen like wings.

Expanse of wings: 29 mm.

One ♀ from Simla, N.-W. India.

Hindmargin of forewings very faintly bent at vein 3, of hindwings slightly dentate at vein 4, and concave between 4 and 6; veins 6, 7 of hindwings stalked. Hind-tibiae of ♀ with terminal spurs only. Apparently related to *elongaria* Ramb. (? = *aridata* Zell.) recorded from Transcaucasia as well as from Spain.

##### 12. *Craspedia compressaria* sp. nov.

*Forewings*: greyish ochreous, with a slight pinkish tinge, and minutely speckled with black: all the lines oblique, parallel to the hindmargin, and slightly darker than the ground colour; first from one-third of costa, angled in cell close before the black cellspot, then straight to one-fourth of inner margin, very indistinct except below middle; median shade from quite two-thirds of costa, excurved beyond cell, and faintly denticulate to middle of inner margin; outer line waved, fine, oblique outwards to vein 6, slightly incurved beyond cell and on submedian fold to three-fourths of inner margin; the teeth basewards above and below vein 5 and submedian fold marked with black points, those on veins 6 and 7 with slighter points; marginal area with two narrow darker denticulate shades enclosing the submarginal line; marginal spots black, distinct; fringe concolorous, with indistinct minute dark dots at base beyond the veins.

*Hindwings*: with the median shade antemedian; the outer line minutely waved and nearly straight, marked with black only on abdominal margin.

Underside paler: the cellspots, outer and marginal lines distinct, blackish. Face and palpi externally black-brown; vertex, thorax, and abdomen like wings.

Expanse of wings: 26 mm.

Two ♂♂ from Bali, low country, March—April 1896 (Doherty).

Allied to *annularia* Swinh., and *spilodorsata* Warr.

13. *Craspedia cretata* sp. nov.

*Forewings*: whitish straw-colour, with fine dark speckles; the lines pale ochraceous, all parallel to each other and to the hindmargin, which is obliquely curved only in the lower half, so that the lines are less oblique than usual; first at one-third, second in middle or just beyond, third at two-thirds, obscurely dentate, sometimes rather darker marked on the veins; subterminal and submarginal lines undulating, indistinct; cellspot and marginal dots black and distinct; fringe concolorous.

*Hindwings*: the same, without first line.

Underside white; the outer lines and marginal dots indicated. Face deep brown; vertex, thorax, and abdomen concolorous with wings.

Expanse of wings: 26 mm.

Two ♀♀ from Sula Mangoli, October 1897 (Doherty).

Like *C. parasira* Meyr., but distinguished by the white ground colour, and more vertical lines: reminding one of a small pale *immutata* Hüb.

14. *Craspedia furfurata* ab. *subcarnea* nov.

Differs from typical *C. furfurata* Warr. in being wholly suffused with a very pale pinkish tinge, instead of being pale straw-colour: the single example is also a little smaller, and has the dark dusting finer.

One ♂ from Calcutta, February 1896.

There are specimens of typical *furfurata* in the Tring Museum from Ceylon, as well as from the Kulu district, Sabathu, and Simla, so that the aberration cannot be looked upon as a southern form. It may be seasonal, as the only dated specimens of the typical form are recorded as taken in July and November.

15. *Craspedia margaritaria* sp. nov.

*Forewings*: pale ochreous or bone-colour, slightly dusted with black scales; the lines faint, pale greyish ochreous: the cellspot a small ochreous ring; very much like *C. vacuata* Guen., but the outer line, instead of being dentate and marked with black dashes on the veins, is very fine and waved, sinuate inwards beyond cell and on submedian fold, and forming two slightly darker lunules tinged with rufous; a row of black marginal spots; fringe concolorous, with black dots at base beyond the veins.

*Hindwings*: similar, with the cellspot black as in *vacuata*.

Underside whitish; the forewing with outer line and marginal spots blackish; towards the costa slightly fuscous tinged, but not nearly so strongly as in *vacuata*. Face and palpi externally black; thorax and abdomen like wings; the latter spotted with black on dorsum.

Expanse of wings: 30 mm.

Two ♂♂ from South Celebes, August—September 1891 (Doherty).

Distinguished from the allied forms by the lower radial rising above the centre of discocellular; the hind-tibiae of the ♂ are wholly bone-colour.

16. *Craspedia rufimixtaria* sp. nov.

*Forewings*: dull flesh-coloured ochreous, with slight dusting of darker scales; lines fuscous grey; the inner line not visible in the type specimen, which is

slightly worn near base ; median obscure and oblique from nearly three-fourths of costa to middle of inner margin ; outer line from six-sevenths of costa to four-fifths of inner margin fine, dentate-lunulate, followed by a cloudy submarginal shade ; cellspot small, black.

*Hindwings* : with curved antemedian and postmedian dark lines, a black cellspot, and two darker shades in the deeper-coloured marginal area.

Underside yellowish ochreous, with a pink tinge ; the outer line only shown. Face and palpi black-brown ; vertex white ; thorax and abdomen like wings.

Expanse of wings : 22 mm.

One ♂ from Selaru, Tenimber Islands, March—April 1897 (Micholitz).

The entire fringes are gone ; there appears to have been no marginal line or dots. Hind-tarsi of ♂ nearly as long as hind-tibiae, which are scarcely thickened, and not aborted, but without spurs.

### 17. *Craspedia undilinea* sp. nov.

*Forewings* : bone-colour, dusted with dark scales ; the lines greyish ochreous ; the first curved, at one-third ; the median shade from two-thirds of costa to middle of inner margin slightly sinuous, somewhat diffuse, sometimes tinged with fulvous ; outer line grey, thick, denticulate, from five-sixths of costa to four-fifths of inner margin ; submarginal line pale, waved, between two ochreous bands ; cellspot black, distinct ; a row of black marginal dots ; fringe concolorous.

*Hindwings* : without first line ; the cellspot larger and prominent.

Underside with cellspots, outer line, and marginal spots distinct ; forewings towards base and costa washed with grey. Face black-brown ; vertex, thorax, and abdomen like wings.

Expanse of wings : 26 mm.

Several specimens from Lifu, Loyalty Islands.

Perhaps a local form of *parasira* Meyr. ; the ground colour paler, and the exterior line much more strongly expressed ; in the prominence of the cellspots of hindwings it agrees with *C. discata* Warr.

### 18. *Eois carneofasciata* sp. nov.

*Forewings* : cream-colour, more yellowish along costa, dusted with grey towards base, and with traces of a curved line at one-third ; outer line distinct, irregularly wavy, at three-fourths, indented on submedian fold ; followed by a lilac-grey fascia of uniform width, its outer edge parallel to the outer line, and starting from the anal angle, abruptly stopping at vein 6 ; beyond the pale submarginal line which succeeds the fascia, the marginal area is pale lilac-grey ; fringe pale, with obscure dark dots beyond the veins ; cellspot small, but distinct.

*Hindwings* : with the outer line and darker marginal area less distinct.

Underside the same ; the basal half of each wing greyer.

Face and palpi dark brown ; vertex, thorax, and abdomen cream-colour.

Expanse of wings : 15 mm.

One ♀ from Mt. Arjuno, Java (W. Doherty).

The forewings are elongate, with the apex produced, the hindmargin oblique and straight ; hindwings small, with rounded hindmargin which is slightly incised beyond cell.



19. *Eois ferrilinea* sp. nov.

*Forewings* : whitish grey, rather coarsely speckled with black and hoary scales; costa greyer; inner and outer lines black; the inner, at one-third, sinuous, curved outwards above and inwards below the median vein, with dark spots on the veins; outer at three-fourths, irregularly dentate inwards on the veins, but forming a prominent tooth outwards on vein 6, and a blunter projection between veins 3 and 4, preceded by a ferruginous median line which is sinuate parallel to inner line, sprinkled throughout with black scales, and starting from a dark costal spot; submarginal line waved, pale, between two dark grey shades, the inner of which is interrupted beyond cell; fringe grey, with patches of black scales at base beyond the vein ends.

*Hindwings* : similar; the discocellular marked with irregular black scales.

Underside grey, without speckling; the outer lines marked by black veinspots. Face and palpi externally black; vertex, thorax, and abdomen grey, finely black-speckled; the abdomen with slight black rings.

Expanse of wings : 14 mm.

One ♂ from Dawson district, N. Queensland, March 1887 (Barnard Collection).

Nearest to *Acidalia halmæa* Meyr., from Sydney and Tasmania, with which it agrees in structure and size.

20. *Eois fucosa* sp. nov.

*Forewings* : pale glossy ochreous; the lines or bands broad, yellow or fulvous ochreous, waved, those beyond middle slightly indented beyond cell, and more strongly on submedian fold; their edges waved; the pale ground colour appearing as narrower bands between them; the single ♂ has the fulvous tints darker than the two ♀♀ (which are, however, both more or less worn), and the basal one-third altogether suffused with fulvous; a very faint darker cellspot on the median band; no marginal dots; fringe concolorous with the darker bands.

*Hindwings* : the same.

Underside with the markings grey tinged and traversed by lighter veins; the forewings darker tinged. Face and palpi externally black brown; vertex, thorax, and abdomen pale ochreous, varied with darker.

Expanse of wings : 13 mm.

One ♂, two ♀♀, from Seahill, Queensland, May 1887 (Barnard Collection).

Hindlegs of ♂ aborted, without spurs; hind-tibiae of ♀ with terminal spurs only.

21. *Eois glabripennis* sp. nov.

*Forewings* : pearl grey, with a faint lilac tinge; the costa finely yellowish speckled with fuscous; no distinct markings; but in certain lights a pale curved median and submarginal yellowish line can be made out, as well as some marginal spots, as in *Eois costiguttata* Warr. from the Khasias, but there are no costal pale blotches; fringe pale grey.

*Hindwings* : the same.

Underside silky whitish; the costa of forewings ochreous with grey speckles. Face and palpi brown; vertex, thorax, and abdomen concolorous with wings.

Expanse of wings : 17 mm.



One ♀ from Mt. Arjuno, Java (W. Doherty); four ♀♀ from Penang, May 1897 (Curtis).

The hindmargin of hindwings is rounded, not subangulate as in *costiguttata*. The species comes close to *E. avicruda* Butl. = *plumbeoscripta* Chr.

## 22. *Epicosymbia conspersa* sp. nov.

*Forewings*: rufous ochreous, the ground colour almost hidden by dense fuscous scales; the lines greyish fuscous; first at one-third, curved; median sinuate and slightly dentate; these two very obscure; outer line at five-sixths, more distinct, dentate; cellspot dark, not very distinct; a fine marginal line of dark scales; fringe concolorous, with small dark dots at ends of veins.

*Hindwings*: with cellspot and outer line only.

Underside pale pinkish ochreous, unspckled, with the outer and marginal lines, cellspots, and marginal dots marked. Head, thorax, and abdomen like wings; face and palpi externally reddish; vertex and shaft of antennae white.

Expanse of wings: 24 mm.

One ♂ from Sumba, February 1896, below 2,000 feet (Doherty).

This species agrees structurally in all points with *Epicosymbia*, the type of which is a South African species.

## 23. *Problepsis argentea* sp. nov.

*Forewings*: silvery white, sprinkled with fine black scales, without markings of any kind.

*Hindwings*: the same; the discocellular marked with brighter metallic scales; fringes of both wings white.

Underside white, without any black scales. Head, thorax, and abdomen white; palpi white, tinged above with rosy; forelegs internally rosy.

Expanse of wings: 32 mm.

One ♀ from Dammer Island, Banda Sea, Dec. 1898 (H. Kühn).

## 24. *Ptychopoda comparanda* sp. nov.

*Forewings*: pale greyish ochreous, dusted with darker; the lines much as in *actiosaria* Wlk., the inner and outer both darker on costa and inner margin; the median shade sinuate, distinct in the ♀; all three lines rather thick; cellspot small, dark; a marginal row of small dark dots, placed at the edge of the wing, not, as in *actiosaria*, at the base of the fringe, which is concolorous.

*Hindwings*: the same, without first line; the antemedian line in the ♀ plain.

Underside whitish; forewings with distinct dark shade close to margin, making the fringe appear paler. Face dark brown; vertex and collar brownish; thorax and abdomen like wings.

Expanse of wings: 16—17 mm.

A pair from Puttalam, Ceylon.

The tuft of the hind-tibiae is wholly ochreous; in *semisericea* Warr. from the Khasias the inside is blackish.

## 25. *Ptychopoda decidua* sp. nov.

*Forewings*: pale ochreous, without the grey suffusion that occurs in *P. actiosaria* Wlk.; the lines in the same position but much less diffuse, the

exterior line slightly curved, but not denticulate; the cellspot and dots in the fringe much smaller and fainter.

*Hindwings*: with antemedian and postmedian lines curved, but not crenulate.

Underside with the two lines of both wings concise and not denticulate.

The pencil of hair on the hind-tibiae of the ♂ yellowish ochreous as in *Pt. actiosaria*.

Expanse of wings: 17 mm.

A pair from Sabathu, N.-W. India, August 1889.

Agrees with *P. semisericea* Warr., from the Khasias, in being paler and smaller than *actiosaria*; but in *semisericea* the tuft of the hind-tibiae is blackish internally.

## 26. *Ptychopoda robusta* sp. nov.

*Forewings*: pale ochreous, overlaid with yellower ochreous scales; the costa narrowly ochraceous; cellspot large, brownish; the lines yellowish ochreous; inner and median lines very obscure; outer line at four-fifths, slightly curved and parallel to hindmargin, followed by a paler band; beyond this the marginal area is again yellower ochreous, traversed by a faintly discernible paler submarginal line; fringe ochreous, with faint brownish dots at base beyond the veins.

*Hindwings*: the same.

Underside paler; the cellspots and outer lines discernible. Face and palpi brownish above, ochreous below; vertex, thorax, and abdomen like wings; collar ochraceous, like the costal edge; antennae with the shaft pale, the cilia ochraceous. Tuft of hair on hind-tibiae ochreous externally, dark fuscous internally.

Expanse of wings: 24 mm.

One ♂ from Negros, Philippines, March and April 1896 (J. Whitehead).

The antennae are subserrate with very long curled cilia; the whole insect has a much more robust appearance than *actiosaria* Wlk. and its allies, to which it is evidently most related.

## 27. *Ptychopoda sextinotata* sp. nov.

*Forewings*: dingy pale grey, slightly tinged in parts with darker; the lines all parallel to each other and to the hindmargin which is oblique; the inner at one-third curved, marked with three blackish spots on veins; median distinct, from two-thirds of costa to middle of inner margin, denticulate and sinuate, incurved below middle; outer line from four-fifths of costa to three-fourths of inner margin, denticulate, sinuate inwards beyond cell, the teeth with dark points on the veins, that on vein 6 conspicuous; the shade preceding the submarginal line exactly parallel to the outer line, the outer shade not sinuate beyond cell, so that the submarginal pale line is broader and more distinct beyond cell: a marginal series of distinct black dots; fringe concolorous; cellspot blackish.

*Hindwings*: similar, the median line becoming antemedian; the tooth on vein 6 of outer line prominent as in forewings.

Underside grey, without distinct markings except the marginal dots. Face and palpi externally fuscous brown; collar dark grey; vertex and antennae whitish; thorax and abdomen like wings.

Expanse of wings: 17 mm.

A pair from Penang (Curtis), the ♀ dated 1896, the ♂ February 1897.

Allied to *Pt. mundaria* Wlk., from Borneo.

28. *Ptychopoda squamipunctata* sp. nov.

*Forewings* : flesh-coloured grey, slightly dusted with darker ; the lines hardly darker ; first at one-third, starting from a small black costal spot ; outer at three-fourths, vertical, a little darker at costa and inner margin, followed by two faint submarginal shades ; fringe concolorous, with distinct double specks of black scales at base beyond the veins ; cellspot dark, indistinct.

*Hindwings* : similar.

Underside paler ; the outer line faintly expressed. Face and palpi brown ; vertex, thorax, and abdomen concolorous.

Expanse of wings : 17 mm.

One ♀ from Mount Arjuno, Java (W. Doherty).

The hindmargins of both wings are subcrenulate. Allied to *actiosaria* Wlk.

29. *Xenocentris incolorata* ab. *taeniata* nov.

The specimen here described as an aberration differs considerably from either of the other ♂♂ seen. It is pale ochreous without any distinct lines, but this may be due to its somewhat wasted condition. The basal half of costa is marked with purplish-fuscons scales ; the cellspot is large and distinct ; before the hindmargin is a waved purplish fuscous fascia, corresponding to what in the typical ♂♂ is the dark grey shade preceding the submarginal line.

*Hindwings* : the same. Both wings dusted with purplish scales. The fringes are quite obliterated.

Underside like upper. All else as in the type ; the tuft of hind-tibiae long and purplish.

Expanse of wings : 13 mm.

One ♂ from the Kei Islands, March 1897 (H. Kühn).

30. *Xenocentris mimica* sp. nov.

Superficially exactly like *Hemipogon nanata* Warr., described from the Tenimber Islands, and of which I have since seen a pair from Ceylon ; differing in having the ♂ antennae armed with long ciliations instead of their being merely pubescent, and the hindwings beneath simply scaled, not clothed with hairs. One ♂ from Penngah, Borneo, December 1893, considerably worn. A ♀ from Mount Dulit, N. Borneo (Hose), perfect except for the absence of abdomen, may almost certainly be referred to the same species. This is dull greyish brown, darker than typical *H. nanata*, and with the markings indistinct ; both inner and outer lines are darker on costa and inner margin in both wings ; the cellspots are blackish and distinct ; and the base of the fringe, which is concolorous with the wings, has a row of distinct but minute dark dots. The underside is paler, more grey, marked only with cellspots and outer line.

Expanse of wings : ♂ 16 mm., ♀ 17 mm.

One ♂ Penngah, N. Borneo, and one ♀ Mt. Dulit, N. Borneo, 1000 to 4000 ft. (Hose).

## SUBFAMILY TEPHROCLYSTIINAE.

31. *Rhinoprora palpata* ab. *decolorata* nov.

In this form all the green tints are absent, being replaced by pinkish grey, the whole wing having a glossy appearance ; the edges of the basal patch and

central fascia are conspicuously blackish, the inside being shaded with brown. Hindwings grey, with a single postmedian angulated line marked by dark vein-dashes. Head and thorax pinkish grey; abdomen pinkish grey speckled with brown; the crests blackish; the basal segment whitish, the second black-brown.

One ♂ from the Nilgiris, S. India.

### 32. *Tephroclystia semicaesia* sp. nov.

*Forewings*: dull purplish grey for basal two-thirds, except a pale brownish ochreous streak from base below median vein extending into the base of cell; inner edge of central fascia angled at the median vein; outer edge curved, from two-thirds of costa to two-thirds of inner margin, bluntly bent below costa; the fascia itself crossed by several darker slightly waved lines and containing a dark cellspot, succeeded by a broad pale band with an ochreous central line; marginal area pale brown, becoming purplish grey beyond the pale waved submarginal line, with a paler oblique streak towards apex; marginal line black, interrupted by pale vein-dots, which are more developed towards apex; fringe purplish grey with a pale basal line.

*Hindwings*: wholly purplish grey, with a dark cellspot and traces of pale antemedian, postmedian, and submarginal lines.

Underside dull purplish grey, with all the markings indistinct; the postmedian band paler. Head and abdomen grey; patagia ochreous.

Expanse of wings: 23 mm.

One ♂ from Beyrout, Syria.

I cannot refer this insect to any known species.

## SUBFAMILY HYDRIOMENINAE.

### *Paralygris* gen. nov.

A joint development of *Diactinia* and *Lygris*; superficially the typical species is marvellously like *D. deleta*; but the forewings of the ♂ have a long pencil of yellowish white hairs along the submedian vein beneath, which is wanting in the species of *Diactinia*, and in addition the antennae of the ♂ are shortly and stoutly bipectinated, whereby the genus is at once separated from *Lygris*. The venation does not vary; the areole of forewings is double; the discocellular of the hindwings oblique and the radial from its centre.

Type: *Paralygris contorta* sp. nov.

### 33. *Paralygris contorta* sp. nov.

*Eustroma deleta* Leach, *Ann. Mag. N. H.* 1897, p. 565 (*nec* Butler).

*Forewings*: dark brown; the lines creamy white; first line from one-fourth of costa to near middle of inner margin, bluntly rounded in cell and slender; two antemedian lines close together, the outer one broader and rising from one-third of costa, the inner from below costa, both running obliquely to the submedian fold at middle of wing, where they are joined by a fine line which, rising from one-third of inner margin, crosses the first line and follows the submedian fold; a similar double line from two-thirds of costa—the outer arm in this case rising below it—bent inwards, and lunulate below middle to inner margin before anal angle, absorbing the other three lines on the submedian fold, and emitting a sharp tooth



inwards on veins 1 and 3; a lunulate submarginal line before apex, interrupted and approximated to outer double line below middle; a broader sinuous line from apex to anal angle and an interrupted marginal line, swollen at veins 3 and 4; the last three lines are all interrupted below the middle by the broad pale brown veins; extreme hindmargin dark brown; fringe brown, varied with paler, and with a whitish spot beyond vein 4.

*Hindwings*: with the ground colour creamy white; a large grey-brown cell-spot; the inner margin at base greyish brown; three sinuated postmedian brown lines, the outermost the broadest; two submarginal lines, the first narrow, the second formed of brown lunules; the paler brown marginal area with a small oblique white streak at apex, and two white marginal spots between veins 3 and 4; marginal line blackish brown; fringe brownish.

Underside more ochreous, with the markings all reproduced, and in some cases darker and more concise: cellspot of forewings blackish, oblique, touching the first double line. Head, thorax, and abdomen whitish ochreous; the patagia and outer side of palpi brown; forelegs brown, spotted with ochreous.

Expanse of wings: 40 mm.

One ♂, one ♀, marked simply "China."

#### SUBFAMILY DEILINIINAE.

##### 34. *Chloroctenis similis* Warr., Nov. Zool. V. p. 42.

The ♂ of *C. similis*, which I have now seen, has, as was anticipated, pectinated antennae; and the hind-tibiae are like those of *Aplochloa*, not thickened, with two pairs of fine sharp spurs. The ♂ is slightly smaller than the ♀, 24 mm. instead of 26 mm.

##### 35. *Heterostegane semifasciata* sp. nov.

*Forewings*: pale straw-colour, with fine brown speckles; first line obliquely curved, at one-fourth; second from two-thirds of costa to middle of inner margin, sinuous, marked above middle only by brown spots on the veins, below middle defined by a broad brown fascia reaching to submarginal line, its outer edge being continued to the costa before apex, forming a bidentate mark beyond cell and another below costa; submarginal line itself ill-defined, and followed by a few brown clouds; marginal spots brown; fringe straw-colour.

*Hindwings*: similar.

Underside wholly straw-colour, mottled with dull brownish. Head, thorax, and abdomen straw-colour.

Expanse of wings: 38 mm.

One ♂ from Kayeli, Burn, March 1897 (Doherty).

The single specimen has unfortunately been exposed to mould and wear, and the basal area of forewings and marginal area of hindwings are rendered thereby obscure. The antennae are armed with very short and fine fascicles of cilia.

#### SUBFAMILY ASCOTINAE.

##### 36. *Alcis nigricuneata* sp. nov.

*Forewings*: grey, tinged with rufous, and finely striated with black; the costa with black strigulations; the lines black, starting from black costal spots;



first at one-fourth, sharply angled on subcostal vein, then oblique to one-fifth of inner margin; second at middle, angled outwards in cell, then oblique, crossing the linear black cellmark, and irregularly crenulate to inner margin close beyond first line; third at three-fourths, at first bidentate inwards, then acutely angled outwards on vein 6, thence oblique to vein 2, forming points outwards on veins, and still more oblique to middle of inner margin; submarginal line pale, acutely dentate, the teeth filled up with black at costa, beyond cell, and on submedian fold, and outwardly margined with black, pointing towards, and in places joining the black marginal spots: hindmargin waved; fringe concolorous.

*Hindwings*: the same, the first line forming a black basal spot; the cellspot oval, black-edged with pale centre; the postmedian line followed by a red shade, which is less distinct, though present, in the forewings.

Underside pale greyish ochreous in hindwings, suffused with dark fuscous in the forewings; the apex remaining pale within a blackish shade; costa ochreous yellow, with black striae; cellspot and outer line marked in both wings. Head, thorax, and antennae ochreous grey, dusted with blackish: collar white; abdomen pale grey, with black segmental marks on dorsum.

Expanse of wings: 44 mm.

One ♂ from Loeboe Rajah, W. Sumatra, April—May 1897 (Ericsson).

Veins 10 and 11 of forewings coincident.

### 37. *Ateloptila confusa* sp. nov.

*Forewings*: dull grey, suffused with smoky fuscous and with numerous transverse fuscous strigae; the markings confused and obscure; first line at about one-third, dark fuscous, obliquely curved outwards to median vein, then inwardly to submedian, below which it is again oblique outwards; a diffuse median shade; second line from three-fifths of costa to two-thirds of inner margin, nearly vertical, sinuous and crenulate; submarginal line formed by dark lunulate blotches between the veins parallel and near to hindmargin; marginal black spots; cellspot black; fringe concolorous.

*Hindwings*: similar, the markings darker and more diffuse.

Underside smoky fuscous: cellspots black; costa of forewing dull ochreous, marked with blackish spots. Head, thorax, and abdomen like wings; face dark brown.

Expanse of wings: 44 mm.

One ♂ from Cedar Bay, Cooktown, North Queensland (Meek).

This insect agrees well with the diagnosis of *Ateloptila* Meyr., both in the absence of a fovea and in the venation, but it seems to me that 11 rises out of 12, 10 anastomosing with 11 and afterwards touching 9. Both wings are elongate, the hindwings with hindmargin crenulate.

### 38. *Chogada perlepidaria* sp. nov.

*Forewings*: pearly grey, speckled and suffused with lilac-brown; first line curved from near one-third of costa to near base of inner margin, preceded by a rufous shade; second line from two-thirds of costa to two-thirds of inner margin, sinuate outwards beyond cell and on submedian fold, followed by a rufous shade; median line rufous, strongly zigzag, touching the dull whitish cell blotch; all 3 lines start from reddish costal spots; submarginal line strongly and acutely dentate,

the teeth filled up with rufous; a dark marginal line, swollen into spots between the veins; fringe silvery white, marked with dark beyond veins.

*Hindwings*: similar, but the median shade thick and straight; a dark spot at base; the shade beyond outer line chocolate brown and connected by a spur with the apex.

Underside greyish ochreous, the margins darker; cellspot of forewings large and black; fringe white, chequered with dark. Thorax and abdomen grey, the latter with dark segmental rings; shoulders tinged with rufous; face fuscous, paler above.

Expanse of wings : 36 mm.

One ♂ from Geraldton, near Cairns, Queensland (Meek).

It is possible that this insect may be Guenée's *exesaria* described from a ♀; but in several points it does not agree with the description.

### 39. *Duliohyphle agitata* ab. *diluta* nov.

Ground colour pale olive ochreous, washed with ochraceous, without any fuscous brown suffusion, so that all the lines and strigae are clear and distinct, the two dark lunules before and beyond the submarginal line beyond the cell alone conspicuous; there is therefore no trace of a paler fascia or blotch, as in the type form, beyond the discal spot.

Underside similarly entirely pale yellowish ochreous, not fuscous brown.

Expanse of wings : 72 mm.

One ♂ marked simply Japan; it is not therefore certain whether the insect represents an accidental paler and larger form, or a local difference.

### 40. *Ectropidia fimbripedata* sp. nov.

*Forewings*: whitish, peppered with dark grey; the lines dark, marked by black dots on veins, and thickened on costa; first at one-third, angled in cell, and incurved below towards base, preceded by a similar, but less distinct line; outer line at two-thirds, parallel in the main to hindmargin, irregularly dentate-lunulate; median line not so well defined, oblique outwards from middle of costa to near outer line, then crenulate and running close to outer line throughout, the space between being whiter than the rest of the wing; hindmarginal third more densely grey-speckled, with an acutely dentate submarginal line, internally black-edged, and between veins 3 and 5 preceded by a blackish blotch and followed by a paler space; marginal spots and cellspot distinct, black; fringe paler, with distinct blackish mottling beyond veins.

*Hindwings*: with base pale; a thick diffuse blackish antemedian, an angled and partly dentate median line, joining antemedian on inner margin, enclosing the black cellspot; submarginal line as in forewings, but preceded on costa and inner margin by large blackish clouds, the area beyond it paler.

Underside of forewings pearly whitish; marginal area dull blackish; cellspot on outer line black; a diffuse median shade joining outer line on vein 2.

Hindwings glistening whitish, thickly clothed with long hairy scales; fringes whitish. Head, thorax, and abdomen whitish, speckled with grey; second and third segments of abdomen dark; fringes of inner margin and of hind-tibiae whitish.

Expanse of wings : 30 mm.

One ♂ from Gunong Ijan, Perak, 2000—3000 feet, March 1898 (Butler).

Near *thricophora* Hmps. from Ceylon.

41. *Myrioblephara pustulata* sp. nov.

*Forewings* : rufous grey, finely dusted with darker ; the lines dark rising from dark costal spots ; first before one-third, curved : outer at two-thirds, parallel to hindmargin, irregularly crenulate, and toothed inwards at the veins ; median line bent round cell and approximated below to outer line ; submarginal line indistinct, with darker shades on each side ; cellspot large, cloudy ; marginal spots small.

*Hindwings* : with straight antemedian and subdentate median, dark lines ; submarginal line indistinct, but preceded towards anal angle by a blackish line.

Underside pearly whitish, with the lines and cellspots blackish ; marginal third dull blackish. Head, thorax, and abdomen rufous grey ; abdomen below whitish.

Expanse of wings : 26 mm.

One ♂ from Government Hill, Penang, 1000 feet, May 1898 (Curtis).

In this species the basal area between the median and submedian veins of forewing is much puckered and distorted, containing a rugose depression nearest base, and a raised pustule below one-third of cell ; the submedian fold and vein being both thickened and curved downwards ; the first median vein rises within the pustule at one-third of cell.

42. *Ophthalmodon fasciata* sp. nov.

*Forewings* : pale whitish green, with slight black dusting ; the usual dentate lines rendered blurred and indistinct by a blackish suffusion ; first line forming a vertical shade at one-fourth ; space between median and exterior line wholly filled in with smoky blackish, extending beyond exterior line, with the edge similarly dentate ; submarginal line distinct, dentate, followed by a smoky black shade, and preceded by a concise black dentate line ; cellspot oval, of the ground colour, edged with black ; marginal spots black.

*Hindwings* : similar, without basal line ; cellspot as in forewings, but included in the darker fascia between the two lines, which is less dense than in the forewings.

Underside whitish green, with the markings blurred grey ; viz., the cellspots, a median shade, a bent outer shade, and a broad marginal border, separated from the outer shade by a narrow bent band of ground colour. Head, thorax, and abdomen pale green ; the abdomen with two rows of dorsal black spots ; face with two black spots.

Expanse of wings : 60 mm.

One ♀ from Waterfall Valley, Penang, June—July 1898 (Curtis). Perhaps a local form of the Javan *clararia* Wlk., but the underside is different.

*Xenosina* gen. nov.

*Forewings* : triangular ; costa straight, arched only at apex, which is slightly prominent ; hindmargin obliquely curved.

*Hindwings* : with apex and hindmargin rounded.

Antennae of ♂ plumose ; palpi long, porrect, densely haired ; forehead rounded, protuberant ; tongue and frenulum present ; hind-tibiae thickened, with four spurs.

*Neuration* : forewings, cell half as long as wing, discocellular vertical ; first median just beyond middle, second at seven-eighths ; radials normal ; veins 7, 8, 9, stalked from close before end of cell ; 10 nearer base ; 11 out of 12 ; 10 anastomoses

with 11 and again at a point only with 8 and 9 ; hindwings ; costal approximated to subcostal at middle of cell : 6 and 7 from upper angle or 7 slightly before it ; medians as in forewing ; no radial. Forewing with distinct fovea.

Type : *Xenosina detrita* sp. nov.

Allied to the *Medasina* group, though much smaller than the average species. The type species superficially resembles *Ectropis*.

#### 43. *Xenosina detrita* sp. nov.

*Forewings* : pale brownish or pinkish grey, freckled with black scales ; traces of a dark line at one-third and an outer line at two-thirds ; submarginal line denticulate, preceded by black marks beyond cell and between veins 2 and 3 ; cell-spot and marginal spots black ; fringe concolorous.

*Hindwings* : with traces of central and submarginal lines ; cellspot and marginal spots as in forewings.

Underside paler, freckled with fuscous ; without markings except the discal and marginal spots. Head, thorax, and abdomen concolorous with wings.

Expanse of wings : 26 mm.

One ♂ from Strathfield, N.S. Wales (Kerslake).

The type is worn, and the description above given is necessarily somewhat deficient.

### SUBFAMILY SEMIOTHISINAE.

#### 44. *Azata tenuilinea* sp. nov.

*Forewings* : flesh-coloured grey, speckled with black and reddish ochraceous ; costa ochraceous with black striae : first line very indistinct, marked by a black spot at costa ; median shade waved, consisting of black lunules between the veins more or less surrounded with ochraceous, the central area through which it runs iron grey and lustrous ; outer line fine and concise, nearly straight from two-thirds of costa to five-sixths of inner margin, placed in the middle of a pale pure ochreous band ; submarginal line preceded from anal angle to vein 6 by a row of black contiguous wedge-shaped blotches, the two beyond cell larger and approaching hindmargin ; apical space pale ochreous ; anal area lustrous grey ; a marginal row of black lunules ; fringe grey, with ochraceous base ; cellspot dark, within the median line.

*Hindwings* : with central line as in forewings ; outer line pale, dentate, marked slightly with ochraceous, and with black dashes on veins ; submarginal only distinct towards anal angle ; black marginal lunules enlarged from apex to vein 4, thence obsolete.

Underside ochreous almost covered with confluent dark grey striae ; the pale band containing the outer line and the apical blotch alone remaining clear ; costa yellowish with black striae. Head, thorax, and abdomen like wings ; the face, shoulders, and dorsum much sprinkled with reddish.

Expanse of wings : 26 mm.

One ♂ from Waterfall Valley, Penang, March—April 1898 (Curtis).

Antennae short, subserrate, and finely ciliated ; the hindmargin of both wings crenulate throughout ; a very distinct species.

## SUBFAMILY ENNOMINAE.

45. *Hyposidra leucomela* ab. *nigrata* nov.

Of three specimens of *leucomela* Wlk., collected by W. Doherty in February and March 1898 in Basilan, the two ♂♂ agree almost entirely with typical specimens from the Philippines, but in the ♀ the white markings are much restricted.

In the forewings four out of the five white markings are much narrower, while the basal mark on the inner margin is quite obsolete; similarly in the hindwing the outer fascia is narrower, and the broad basal fascia altogether absent.

The ♀ is smaller than the average ♀♀—52 mm. instead of 65 mm.; the ♂♂ are of the usual size.

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## NEW GENERA AND SPECIES OF AMERICAN *DREPANULIDAE*, *THYRIDIDAE*, *EPIPLEMIDAE* AND *GEOMETRIDAE*.

By W. WARREN, M.A., F.E.S.

### FAMILY *DREPANULIDAE*.

#### 1. *Platypteryx obtruncata* sp. nov.

*Forewings*: rufous ochreous, dappled with darker rufous and fine grey scales; the veins finely pale ochreous; an irregular angular-edged rufous fascia from below costa before middle to one-third of inner margin, broadest in cell; a fine pale ochreous submarginal line from the costal elbow, angled outwards above vein 6, then nearly straight to three-fourths of inner margin, the costal area in front of it thickly dappled with dark grey, the portion below the angle preceded by very fine grey scaling between the ochreous veins; a row of black submarginal spots between the veins; apex pale ochreous along costa, dusted with grey specks below; fringe red-brown.

*Hindwings*: with the pale postmedian line nearly straight, at three-fifths; the basal area grey between the veins; costal area ochreous; marginal area dark ochreous, grey-speckled, paler towards apex; in it beyond the postmedian line are two large oval hyaline blotches between veins 4 and 6; fringe red-brown, with a paler line at base beyond a row of marginal dark spots.

Underside of forewings ochreous, coarsely mottled with reddish fuscous and black; the inner margin paler, without speckles; outer straight line marked in reddish fuscous; the submarginal spots black, the extreme apex vinous; hindwings speckled only along costa and hindmargin, with two broad diffuse purplish fuscous fasciae, one postmedian, the other submarginal. Thorax rufous ochreous, like ground-colour of wings.

Expanse of wings: 44 mm.

One ♀ from Bahia (Feld. Coll.).

The costa of forewings is strongly elbowed at two-thirds, the apex triangularly produced. Both head and abdomen on this specimen are substitutes; the head is evidently that of a ♀ *Pyralid*.

### FAMILY *THYRIDIDAE*.

#### 2. *Aziba substrigata* sp. nov.

*Forewings*: glossy, pale pinkish ochreous, thickly freckled with brown-black atoms, which become larger and irregularly confluent towards inner margin, and form indeterminate oblique streaks parallel to hindmargin: a more distinctly edged

darker streak from middle of inner margin, bent and obsoletely forked on vein 2, and disappearing at vein 6, above which are two black-brown dots, the upper close to vein 8 the larger, and connected by a grey-brown streak with the apex ; costal area broadly cream-colour for four-fifths from base, beyond which the streak becomes narrower and chequered with pinkish ochreous ; two submarginal curved rows of brown spots ; fringe deeper pink.

*Hindwings* : deeper ochreous, strongly speckled with brown, and with three brown fasciae, distinct only on the inner half of wing, the innermost broadest and partially double.

Underside paler : the markings of the hindwings black-brown and reticulated ; on the forewings confined to the base and inner margin as far as vein 2 only. Face and vertex deep brown ; palpi and antennae black ; thorax and abdomen like wings, the latter with brown segmental rings : legs pale ochreous, underlined with black ; the spurs black.

Expanse of wings : 56 mm.

One ♀ from Costa Rica.

Allied to *Aziba falcata* Feld. (= *serpula* Guen.) ; distinguished by the much paler, more flesh-coloured tint, less defined markings, and, in particular, by the absence of the white discal spot of hindwings. The hindmargin of forewings is more oblique and less bulged.

Pagenstecher (*Iris* v. p. 90) mentions an example most probably of this species, also a ♀, from Massanari on the Amazons, in the Staudinger Collection, which he refers as a probable variety to *falcata*.

### 3. *Hypolamprus parisignata* sp. nov.

Extremely like *Symphleps ochracea* Pag., from Java, N. Guinea, etc., but rather paler and smaller ; the wings narrower : instead of the white cell-spot, two small black dots with a few black scales round them, on both wings above, whitish surrounded with black scales below ; the small black marginal dots on both wings absent : the costa of forewings slightly darker ; in all other respects the markings agree. Though thus superficially resembling the species of *Symphleps*, in *parisignata*, however, instead of veins 8, 9, 10 of the forewings being stalked together as in *Symphleps*, only 8 and 9 are stalked, and 10 rises from the cell as in *Hypolamprus*.

Expanse of wings : 22 mm.

One ♂ one ♀ from Onoribo, Surinam, Feb. and March 1893 (C. W. Ellacombe).

### 4. *Iza multifasciata* sp. nov.

*Forewings* : creamy white, crossed throughout by numerous pale ochreous fasciae, running obliquely, parallel to hindmargin, all becoming darker and more definite below the median vein, those beyond the middle between vein 4 and the submedian fold shading into grey and forming an irregular triangular blotch : costal and submarginal areas paler than the rest of the wing : marginal area more ochraceous and with slight ferruginous speckles : fringe ochreous.

*Hindwings* : with six more defined dark fasciae, leaving more distinct whitish fasciae between them ; apex of both wings slenderly pale before fringes.

Underside the same, the dark markings more mixed with grey. Head, palpi, and shoulders brown : thorax and abdomen mixed ochreous and white.

Expanse of wings : 24 mm.

One ♂ from Cachabi, Ecuador, low country, Dec. 1896 (Rosenberg).

The antennae are short, thick, and lamellate; the insect bears a slight resemblance superficially to a large *Addaea striola* Feld.

##### 5. *Iza rosenbergi* sp. nov.

*Forewings*: ochreous, the costal area above subcostal vein and the whole of the wing below the median vein and vein 4 suffused with rosy grey, which to a great extent hides the markings; the cell area only remaining ochreous with bright fulvous reticulations. A fulvous patch at base; a fulvous fascia at one-third, angled in cell, a smaller one in middle, and a broad one before apex, curved outwards below costa, then running to anal angle, where it is lost in a dull dark cloud; the apical area beyond it pale ochreous with grey streaks; fringe pale ochreous, becoming darker round anal angle.

*Hindwings*: ochreous suffused with rosy fulvous, the base and a central curved fascia darker; submarginal fascia, as in forewings, cutting off a pale apical space to middle of margin, then marginal.

Underside ochreous with ferruginous spots and reticulations, the outer fascia in forewings, and the outer and central in hindwings alone distinct; forewings with brown cell-spot. Face and palpi dark brown; collar golden ferruginous; thorax and abdomen ochreous much mixed with brown.

Expanse of wings: 38 mm.

One ♀ from Paramba, Ecuador, May 1897, dry season, 3500 ft. (Rosenberg).

Forewings with costa straight, but shouldered at base; apex rectangular, blunt; hindmargin in upper half nearly vertical, then strongly curved. Hindwings with anal angle rounded off; apical angle bluntly rounded; hindmargin evenly curved; palpi smooth, long, porrect, third joint as long as second.

Named in honour of the collector.

##### 6. *Iza rufigrisea* sp. nov.

*Forewings*: dull brick-red, crossed by dense crinkled purplish grey lines, which leave only the costal area before and beyond the middle and a space below the end of cell, of the ground-colour; the grey lines, which are thickest near base, beyond cell, and along the hindmargin, embrace between them rows of pale annuli between the veins; these annuli are all more or less suffused with grey, but are sometimes tinged with reddish; at the base of veins 4, 5, and 6, 7 are two darker spots; costa marked with pairs of grey lines; fringe grey tinged with rufous.

*Hindwings*: with the coloration reversed, the area about anal angle being dull red, and the costal and apical areas overrun with the grey lines.

Underside similar, but clearer; the annuli paler. Head (worn), rufous grey; thorax and patagia dark purple-grey; abdomen wanting; palpi long, upcurved, second joint purple-grey, terminal joint rufous.

Expanse of wings: 26 mm.

One ♂ from Palma Sola, Venezuela.

##### *Stenocopsis* gen. nov.

Agrees in structure and venation with *Mathoris* Wlk., veins 9, 10 of forewings being stalked, but differs entirely in shape of wings. These, instead of being broad, with rounded, even margins, are narrow and elongated.

*Forewings* : with costa straight, becoming convex just before apex, which is slightly produced ; hindmargin oblique and sinuous.

*Hindwings* : with apex acutely produced, hindmargin distinctly concave from apex to vein 2, thence straight to anal angle ; inner margin short. Palpi short, porrect ; antennae thick.

Type : *Stenocopsis albiapicata* sp. nov.

#### 7. *Stenocopsis albiapicata* sp. nov.

*Forewings* : ochreous bone-colour, slightly black-speckled, with the markings dull fulvous ; costal area and inner margin below submedian vein dull fulvous ; a narrow band at one-fourth, a second before middle, a broader oblique funnel-shaped mark beyond middle, and a narrow sinuous submarginal band all fulvous ; a small oval white spot at apex with a minute black dot in the middle ; from the outside of this spot a fine black line runs before the margin, the extreme hindmargin being left pale ; marginal line itself blackish and thick, interrupted above anal angle beyond a paler blotch ; fringe ochreous, broadly chequered with black beyond the vein ends, but wholly ochreous above anal angle.

*Hindwings* : partially suffused with dark grey ; with traces of three parallel diffuse bands, one near base, of black scales, a sinuous brownish one in middle, and a finer more obscure submarginal shade ; marginal line thick, black from apex to vein 2 ; fringe as in forewings to vein 2, thence to anal angle wholly ochreous.

Underside the same, the markings rather plainer. Head, thorax, and abdomen ochreous.

Expanse of wings : 17 mm.

One ♀ from Caicara, Orinoco, April 1898 (Cherrie).

#### 8. *Striglina rufitibia*.

*Orthogramma rufitibia* Feld Reise Nov. Pl. 117, fig. 2.

*Striglina rufitibia* Guen. Ann. S. E. Fr. 1877, p. 286.

„ „ Pag. Iris. V. 1892, p. 43.

A ♂ from Onrem, near Para, dated February 2nd, 1894, evidently belongs to this species, of which a fuller description than Guenée's is here appended.

*Forewings* : greenish ochreous, with numerous curved rufous strigae ; traces of an inner line oblique from one-fourth of inner margin ; cell-spot formed of a few white scales surrounded with rufous ; the oblique outer line appears to be angled below costa, the whole marginal space beyond being darker rufous ; fringe rather deeper.

*Hindwings* : with a broad straight rufous shade before middle, followed by a series of irregularly crenulate and interrupted rufous lines ; the whole wing paler, like the basal part of forewings.

Underside of forewings deep reddish fulvous with darker striae, of hindwings dull orange with lines of rufous striae. Face, upper surface of palpi, and vertex dark brown ; thorax and abdomen like wings ; lateral edge of shoulders, underside of palpi, and legs vermilion ; the forelegs externally dark fuscous. Antennae (of ♂) subserrate and strongly ciliated.

The ♀, of which I have seen an example from British Guiana, is much larger (56 mm.) and redder, with the markings and cell-spots better defined.



9. *Zeuserodes argentistriata* sp. nov.

*Forewings* : pale wood-colour, slightly reddish tinged ; costa and hindmargin paler, passing into ochreous ; these latter areas with coarse black atoms ; the duller redder portion with obscure and irregular blackish striae ; the dark markings forming an oblique cloud from beyond middle of inner margin to beyond cell ; an apical spot with black centre ; fringe with basal half darker than apical half, which is chequered with black scales.

*Hindwings* : with the reticulations and markings much blacker, forming a central blackish band angled externally ; apical area dark ; a slight rufous streak along hindmargin between the middle and anal lobes.

Underside of forewings with the subcostal and submedian areas dull reddish ; the costal and hindmargins ochreous, all alike speckled with black, the apical spot whitish ; all the veins beyond cell finely marked with silvery scales ; hindwings as above. Head, thorax, and abdomen like wings ; face below pale ochreous with a black bar in middle ; shoulders and front of thorax brown-black ; anal segments of abdomen with brown-black dorsal and lateral lines.

Expanse of wings : 30 mm.

One ♀ from Ciudad Bolivar, Venezuela, November 1898 (S. Klages).

The hindwings in this ♀ may be called three-lobed : the apex forming a blunt prominence, the hindmargin below middle being produced into a broad almost angular tooth, and the inner margin which is quite short forming a smaller lobe ; the hindmargin between the middle projection and apex being concave and crenulate.

Whether these ♀♀ of *Zeuserodes* with more or less sinuous hindwings have in all cases ♂♂ with straight hindmargins does not seem as yet by any means certain.

In the Proceedings of the Zoological Society for 1897, p. 631, a figure with the venation of *Meskea dyspteraria* Grote is given by Sir G. Hampson ; from this it is evident that my suggestion in Nov. Zool. IV., p. 410, as regards the identity of Pagenstecher's genus *Zeuserodes* and Grote's *Meskea*, was wrong, and the two genera must be kept separate.

## FAMILY EPIPLEMIDAE.

*Antiplecta* gen. nov.

*Forewings* : shaped as in *Dirades* Wlk.

*Hindwings* : with hindmargin bluntly bent at veins 6 and 7, without any tooth ; the costa strongly convex, without emargination or tufts of hair.

Palpi shortly porrect, pointed. Antennae flattened, lamellate.

*Neuration* : forewings much as in *Dirades* ; but vein 11 anastomoses with 12 ; veins 6 and 7 are short-stalked, and 5 rises nearly from centre of discocellular. In hindwings the costal is strongly curved away from subcostal from base, 6 and 7 from top angle of cell ; the median and all its branches hidden beneath the fold ; the wing is folded over beneath with a tuft of hair on the under surface.

Type : *Antiplecta pusilla* sp. nov.

10. *Antiplecta pusilla* sp. nov.

*Forewings* : greyish brown ; the costa darker ; basal two-thirds, as far as outer line, darker than marginal area beyond ; outer line strongly incurved above middle, incurved to vein 2, then vertical to inner margin ; inner line very obscure, at



one-third, bluntly inangulated in midwing; a row of small black submarginal dots between the veins; fringe glossy, beyond a brown marginal line.

*Hindwings*: with outer line ferruginous, curved from middle of costa to the margin of fold, three-fourths from base, and there much dilated; the fold grey, with a black spot at one-third from base; a brown marginal line with a black dot at end of vein 4.

Underside speckled, cinereous; the tuft in fold blackish. Thorax and abdomen like wings; vertex white; face and palpi brown-black.

Expanse of wings: 16 mm.

One ♂ from Dominica, June 1897.

### *Coeluromima* gen. nov.

Like *Coelura* Warr., but distinguished by the antennae. In *Coelura* these are uniserrate in both sexes. In the present genus the antennae of the ♀ are simple, those of the ♂ shortly bipectinated.

Type: *C. subfasciata* sp. nov.

#### 11. *Coeluromima subfasciata* sp. nov.

*Forewings*: ochreous grey, striated and in parts washed with leaden grey and ochreous; two dark brown oblique lines from inner margin at one-fourth and two-thirds, the former edged inwardly, the latter outwardly with pale, the one running to the diffuse cell-spot and there angled and retracted obscurely to costa, the other acutely angled shortly before apex; costa obscurely spotted with blackish; a narrow blackish streak along hindmargin; fringe dark grey.

*Hindwings*: with faint antemedian and more distinct postmedian dark line, the latter followed by a dark band; area round anal angle with blackish streaks.

Underside ochreous whitish, unspeckled, except towards hindmargin, which is marked with black strigae; a broad submarginal blackish fascia, often irregular. Face and palpi dark brown; thorax and abdomen like wings.

Expanse of wings: 30 mm.

One ♀, one ♂ from Chimbo, Ecuador, 1000 ft., August 1897 (Rosenberg).

The ♂ is much more clouded with grey than the ♀, but this is probably not always the case.

#### 12. *Dirades infans* sp. nov.

*Forewings*: lilac-grey, dusted with darker; central fascia darker, tinged with brownish, and edged by thick dark brown lines; first well curved at one-third; second from three-fourths of costa to four-fifths of inner margin, oblique outwards to vein 6, then vertical to below vein 4, then incurved to submedian fold and again oblique outwards to margin; this edge is slightly crenulate, and margined by a fine pale line; marginal area with a dark cloud at costa and a more conspicuous one at anal angle; a submarginal row of minute dark dots; fringe brownish grey; veins across central fascia partially pale.

*Hindwings*: similar, both the lines curved: marginal area silvery grey, with a brown line before fringe, containing a black spot with a whitish dash before lower tooth.

Underside brownish grey. Head, thorax, and abdomen grey; the abdomen with a dark patch on dorsum in middle and a dark band before anal segment.

Expanse of wings : 13 mm.

One ♀ from Newcastle, Jamaica, September 1893.

Inner margin of forewings sinuate, convex in basal, concave in outer half ; hindwings with a distinct tooth at vein 4, and slighter ones at 6 and 7. In forewings vein 11 anastomoses with 12.

### 13. *Epiplema rufula* sp. nov.

*Forewings* : greyish brown or rufous brown, irregularly speckled with darker ; two diffuse dark brown lines, limiting a central fascia, which is deeper coloured than the rest of the wing ; the first from one-third of costa to one-third of inner margin, inbent on the median vein, the second from two-thirds of costa to middle of inner margin, somewhat bent outwards on median vein ; traces of a submarginal line, forming two dark brown spots beyond cell.

*Hindwings* : with an indistinct dark brown central fascia, edged by darker lines.

Underside rufous ochreous, without markings. Head, thorax, and abdomen concolorous with wings ; face and palpi brown-black.

Expanse of wings : 26 mm.

Two ♀♀ from Paramba, Ecuador, January to May 1897.

Forewings falcate, the apex acute ; a bluntly rounded projection beyond vein 3, below which the hindmargin is straight and oblique, above it concave. Hindwings with slight blunt tooth at vein 4, and a more acute one at vein 7.

Neither of the two examples is in perfect condition ; there appears to be a dark basal patch on the forewings, edged by a deep brown line.

### 14. *Leuconotha subfumida* sp. nov.

*Forewings* : smoky white, with the costa and all the veins brown ; fringe whitish.

*Hindwings* : the same, but the veins hardly marked ; costal area whiter.

Underside similar ; the hindwings paler.

Thorax and abdomen like wings ; face and vertex white ; collar yellow.

Expanse of wings : 24 mm.

One ♂ from Palma Sola, Venezuela.

### 15. *Psamathia subangulata* sp. nov.

Differs from *P. placidaria* Wlk., in having the hindmargin of forewings with a very distinct angle at vein 4, and the apex acutely produced and shortly subfalcate, instead of, as in typical *Psamathia*, having the margin straight from apex to anal angle.

*Forewings* : uniform pale lilac-grey, thickly rippled with brown-black, especially towards the hindmargin ; a small coal-black spot at middle of base ; first line at one-third, angled and with a dark brown spot at the subcostal vein, then nearly straight and very slender to inner margin at one-third ; second at two-thirds, oblique and slightly sinuous outwards to vein 4, then strongly incurved and vertical to inner margin beyond two-thirds, geminated in its lower half ; a dark blotch towards hindmargin between veins 6 and 7.

*Hindwings* : with an acutely angled outer line, dark brown and double from costa to the angle, slender and indistinct below ; a thick brown marginal shade from apex to the tooth, which contains a large chocolate-brown spot.

Underside paler, without speckling. Vertex, thorax and abdomen concolorous ; face, palpi, and antennal pectinations dark brown ; fringes worn.

Expanse of wings : 30 mm.

One ♂ from St. Vincent, March 1897 (Dr. P. Rendall).

#### 16. *Syngria* (?) *cinerea* sp. nov.

*Forewings* : dark ashy grey, with dense black speckling ; traces of diffuse black shades near base, before middle, and at two-thirds, this last more distinct, angled outwards in middle, then concave to near before anal angle ; costa marked with narrow black spots ; veins towards hindmargin finely paler ; fringe brownish grey.

*Hindwings* : with some black scales near base, and diffuse central and submarginal shades ; inner marginal area paler grey ; the veins pale ochreous ; fringe brownish, beyond a pale marginal line, which towards anal angle is preceded by black marginal dots.

Underside dull brownish cinereous, faintly mottled with darker ; forewings with a submarginal, hindwings with a submarginal and marginal obscurely marked darker fascia. Head, thorax, and abdomen cinereous : face and palpi brown.

Expanse of wings : 28 mm.

One ♀ from Palma Sola, Venezuela.

### FAMILY GEOMETRIDAE.

#### SUBFAMILY OENOCHROMINAE.

#### 17. *Leptoctenista subrufa* sp. nov.

*Forewings* : olive-brown with a reddish tinge, thickly strigulated with darker ; the extreme hindmargin simply rufous ; an obscure dark cell-spot, and two dark costal marks, one at three-fourths, the other shortly before apex, the latter indicating the beginning of an obscure dark dentate submarginal line, which on the veins below the costa is followed by three or four pearly grey wedge-shaped streaks ; fringe rufous.

*Hindwings* : with the outer half darker ; traces of a curved central paler line, marked with black dashes on the veins, and a fainter submarginal line ; costal area pink.

Underside uniform coppery red, with dark cell-spots, that in the hindwings larger and more conspicuous. Face, palpi, antennae, and vertex deep red ; thorax and abdomen like wings.

Expanse of wings : 44 mm.

Two ♀ ♀ from Cachabí, Ecuador, low country, January 1897 (Rosenberg).

#### SUBFAMILY MECOCERATINAE.

#### 18. *Hyphedyle albimacula* sp. nov.

*Forewings* : rufous grey in the basal half, becoming altogether deep dull red in the outer third of the wing ; the costal area olive-ochreous with darker striations ; a faint dark cell-spot ; beyond it a large tadpole-shaped snow-white blotch, the tail pointing towards the costa ; fringe dull red.

*Hindwings* : with the marginal area more narrowly red, the fringe paler.

Underside redder ; inner marginal area of forewings pale and blurred ; some

pearly grey scales in the red before the hindmargin ; hindwings more mottled, the inner as well as the outer margin with grey scales. Head, thorax, and abdomen grey.

Expanse of wings : 36 mm.

One ♂ from Paramba, Ecuador, April 1897, dry season : 3500' (Rosenberg).

Much like *rubedinaria* Wlk., but distinguished by the white blotch.

None of the veins of forewings are distorted.

#### SUBFAMILY CYLLOPODINAE.

##### 19. *Atyria?* *mamillifera* sp. nov.

*Forewings* : shaped as in *A. isis*, and with the band abbreviated as in the aberration *ops* Drnce ; but the costal projection mamillate, and rounded below vein 3, instead of being diffusely pointed.

*Hindwings* : with the black border not narrowed, as in *ops*, but of equal width with typical *isis*.

Underside the same. Head and abdomen as in *isis*.

Expanse of wings : 41 mm.

One ♀ from Cachabí, Ecuador, low country, January 1897 (Rosenberg).

##### 20. *Cylopoda attenuata* sp. nov.

Like *C. claudicula* Dalm. and *dichroa* Perty, but very much smaller ; the oblique yellow fascia much narrower and with straighter edges. In the hindwings the black streak that separates the two yellow portions is narrowed and wedge-shaped towards the hindmargin which it sometimes does not reach.

Expanse of wings : 26-28 mm.

Two ♂♂ from Sao Paulo.

##### 21. *Cylopoda nanipennis* sp. nov.

*Forewings* : dark brown-black, slightly powdered with paler scales ; an elongated semi-oval yellow blotch from base to near anal angle, lying between the submedian vein and the median ; a narrow oval blotch from below costa at three-fifths to before hindmargin above the anal angle, vein 3 marked across it with black scales which are thickened basewards.

*Hindwings* : with a small curved yellow blotch towards apex, and a narrower dark-suffused one above anal angle.

Underside the same ; the forewings browner, the hindwings shot with blue. Head, thorax, and abdomen like wings ; top of face with a yellow bar : pectus, legs, and undersurface of abdomen yellowish, with some fuscous scales intermixed.

Expanse of wings : 36 mm.

One ♂ from Rio Uchiaco, and another from Sarayaco.

Distinguished from *C. matutina* Wlk., which it most resembles, by the small size of the hindwings ; the pectinations of the antennae are short.

#### *Cyphopora* gen. nov.

*Forewings* : with costa curved and towards apex strongly convex : apex and hindmargin rounded.

*Hindwings* : with both angles and the hindmargin rounded.

Antennae of ♀ shortly pectinated ; palpi porrect, reaching well in front of face, the second joint hairy, the third slender, as long as second ; tongue and frenulum present.

*Neuration* : forewings, cell three-fifths of wing ; discocellular biangulated, vertical above and again shortly below, oblique between ; median vein bent upwards towards end ; first median nervule at five-eighths, second at seven-eighths ; lower radial from lower angle of discocellular, and therefore not far above third median, strongly curved at origin ; upper radial straight from upper angle of cell ; 7, 8, 9, 10, stalked ; 11 anastomosing for some distance with 12 ; hindwings, with 6 and 7 short stalked ; the medians and radial as in forewings ; costal closely approximated to subcostal near base, but apparently not connected by any bar.

Scaling sparse ; wings semihyaline.

Type *Cyphopora dubia* sp. nov.

Notwithstanding the anomalous neuration, I shall refer this genus for the present to the geometrid subfamily *Cyllopodinae*.

## 22. *Cyphopora dubia* sp. nov.

*Forewings* : hyaline white, with the veins dark grey ; costal area narrowly dark grey ; hindmargin more broadly grey, the dark area thinning out to a point above anal angle ; a faint grey cloud from three-fourths of inner margin to vein 2.

*Hindwings* : with narrower grey hindmargin, ending, as in forewings, before anal angle.

Underside as above ; the costa of hindwings also greyish ; retinaculum (♀), a small round patch of grey scales. Face, palpi, and legs blackish, speckled with white ; thorax whitish : vertex, shoulders, and base of patagia yellowish ; abdomen grey ; anal segment, especially beneath, bright orange.

Expanse of wings : 35 mm.

One ♀ from Paramba, Ecuador, April 1897, dry season, 3500 ft. (Rosenberg).

## 23. *Darna marginata* sp. nov.

*Forewings* : pale yellow, with the base, the costa narrowly, and the hindmargin broadly black, the latter narrowing off to a point at anal angle.

*Hindwings* : with hindmargin black from apex to anal angle.

Underside like upper. Head, thorax, and abdomen black.

Expanse of wings : 35-38 mm.

Two ♀♀ from Cúcuta, Venezuela.

## *Hadesina* gen. nov.

*Forewings* : costa nearly straight ; apex blunt ; hindmargin obliquely curved.

*Hindwings* : with both angles and hindmargin rounded.

Antennae (♀) shortly pectinated ; palpi ?

*Neuration* : forewings, cell only one-third of wing ; discocellular oblique ; first median nervule close before end of cell, second and third stalked ; radials near together from centre of discocellular ; 10, 7, 8, 9, stalked ; 11 free ; hindwings, cell below reaching beyond half of wing ; discocellular twice bent, elongate ; first median at three-fourths, second and third stalked ; radial from lower angle of discocellular ; 6 and 7 long stalked ; costal well separated from subcostal.

Wings hyaline.

Type *Hadesina limbaria* sp. nov.



24. *Hadesina limbaria* sp. nov.

*Forewings*: hyaline, with the veins black; costal, hind, and inner margins black; a small black blotch at one-third of costa embracing the discal spot; a broad black oblique band from two-thirds of costa to hindmargin above anal angle.

*Hindwings*: with costal and hindmargins black; the veins black; a blackish cloud towards base along submedian fold.

Underside like upper. Head, thorax, and abdomen all black.

Expanse of wings: 39 mm.

Two ♀♀ from Chimbo, Ecuador, 1000 ft., August 1897 (Rosenberg).

*Macroneurodes* gen. nov.

*Forewings*: with costa slightly curved throughout; apex blunt; hindmargin curved.

*Hindwings*: with apex rounded; hindmargin slightly bent at veins 3 and 1 *b*; the true innermargin short.

Antennae of ♂ pectinated for four-fifths; palpi laxly haired, upcurved in front of face; tongue and frenulum well-developed; hindtibiae with 2 pairs of short stout spurs.

*Nervation*: forewings; cell reduced, about one-sixth of wing; discocellular concave in middle, shortly oblique above and below; median vein much thickened and sinuate, curved downwards beyond cell; the first median nervule rising just before middle of wing, second and third separating at two-thirds; the two radials from the ends of the concavity of the discocellular, both thickened for nearly one-third of their length, and forming a strong ridge on the undersurface; the wing-membrane beyond cell between the subcostal and median veins bladdery and distorted; subcostal vein swollen and sinuate like the median, but curved upwards beyond cell; 10, 7, 8, 9, stalked from before upper angle, 7 running near and parallel to the upper radial; 11 from near base; submedian fold, approximated to median vein, and like it thickened and subsinuate in the basal half.

*Hindwings*: discocellular with short upper and lower arms, the upper vertical, the lower oblique, and with the long central portion running parallel to subcostal; costal divergent from subcostal; veins 3, 4, and 6, 7 stalked; vein 2 at five-sixths.

Type: *M. albimacula* sp. nov.

25. *Macroneurodes albimacula* sp. nov.

*Forewings*: white in basal half, smoky black beyond; costal area above subcostal vein, except a basal streak, and inner margin below submedian vein, smoky blackish; the veins slightly marked with black, the submedian fold strongly and thickly blackened; the edge of the apical black portion starts from the costal streak at two-fifths and runs obliquely towards anal angle, forming a sharp tooth basewards at the separation of veins 3 and 4; in the apical portion is an oblique elongate white blotch reaching from below costa to vein 4; fringe smoky black.

*Hindwings*: white, with the costa narrowly, the apex and hindmargin broadly, smoky blackish, the tint apparently running up along the inner margin also; in the black border at the apex is a large oval white spot; fringe smoky black; the veins finely dark.

Underside the same : face white ; palpi, thorax, and abdomen blackish mixed with white ; shoulders yellow ; legs black and white.

Expanse of wings : 38 mm.

One ♂ from Bogota, Colombia.

26. *Momonipta? semilugens* sp. nov.

*Forewings* : dull smoky black ; at one-third of costa a white fasciaform blotch begins quite narrow, widens out to below the median vein, and occupies the second third of inner margin ; two white oval subapical spots, separated by vein 7 ; a faint pale oval space beyond cell ; fringe black.

*Hindwings* : white, with a broad smoky black border from two-thirds of costa to two-thirds of inner margin, narrowest at the middle of the wing.

Underside similar. Face, legs, and underside of abdomen bluish white ; palpi, head, thorax, and abdomen smoky black.

Expanse of wings : 26 mm.

Two ♂♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

27. *Phaeochlaena basalis* sp. nov.

*Forewings* : black, towards the base somewhat hyaline ; a pale hyaline streak from base beneath median vein to just before origin of first median nervule ; two shining white spots beyond the middle, placed obliquely and nearly touching, the upper, above the median, twice as large as the lower, which is placed between veins 2 and 3 ; two slight white dashes on veins 5 and 6 towards hindmargin ; fringe black.

*Hindwings* : black, with a hyaline whitish central streak from base to two-thirds of wing, lying mainly below median vein, but partly extending along the cell.

Underside the same. Face and palpi black above, white at sides ; thorax and abdomen cinereous ; base of shoulders broadly orange

Expanse of wings : 35 mm.

One ♀ from San Pedro Sula, Honduras.

28. *Phaeochlaena nubilosa* sp. nov.

*Forewings* : dull greyish brown, all the veins finely yellow ; a pale whitish patch at base of cell, a slighter one beyond cell and a small yellow spot before apex at the origin of veins 7, 8, 9 ; fringe concolorous.

*Hindwings* : whitish, with a broad hindmarginal black border, scarcely reaching the anal angle ; costal border narrow.

Underside paler brown ; the veins not yellow ; no subapical pale spot in forewings. Face, vertex, and palpi yellow ; shoulders ochreous and fuscous ; patagia orange edged with fuscous ; thorax ochreous ; abdomen cinereous.

Expanse of wings : 30 mm.

One ♂ from Chimbo, Ecuador, July 1897, 1000 ft. (Rosenberg).

29. *Scaea caesiopicta* sp. nov.

*Forewings* : basal two-thirds orange ; costal edge and inner margin to submedian vein deep purple-black ; the veins and folds black ; marginal third blue-grey, shading into blue-green in certain lights, separated from the orange area by a

sinnous velvety black shade from two-thirds of costa to before anal angle ; fringe blue-grey.

*Hindwings* : with the inner marginal half greyish blue, the costal half smoky purplish black ; the veins black ; the fringe blue-grey.

Underside like upper, but the dark tints all paler ; veins of the yellow area of forewing not black ; costal edge only finely black ; the dark shade between the tints diffuse and broad. Head and thorax brownish cinereous ; abdomen bluish grey ; abdomen beneath and legs brownish grey.

Expanse of wings : 52 mm.

One ♀ from between R Songo and R. Suapi, Bolivia, 1100 m., March to June (Garlepp).

### 30. *Scaea discinota* sp. nov.

*Forewings* : with basal half orange, the veins and costa narrowly, the inner margin broadly black ; outer half dark purplish grey, with a vertical black bar limiting the orange half ; fringe concolorous with outer half.

*Hindwings* : with more than the basal half orange ; hindmargin purplish black, starting from three-fifths of costa, curved outwards and much narrowed to anal angle, touching a black spot on upper arm of discocellular ; costa very narrowly, inner margin more broadly black ; veins finely black.

Underside similar ; the veins less broadly black. Head, thorax, and abdomen black.

Expanse of wings : 48 mm.

One ♀ from Pedregosa, Merida, 3000 m., October 1897 (Briceno).

### 31. *Tanaostyla conjunctiva* sp. nov.

*Forewings* : hyaline whitish, the veins and folds smoky black ; costal area above the subcostal vein and inner margin below the submedian black ; apex and hindmargin more broadly black ; an oblique pure white blotch beyond the cell from below costa to vein 3, its inner edge fairly straight, its outer somewhat rounded and lobed between the veins ; the median vein, the two lower median nervules, and the discocellular more thickly black than the other.

*Hindwings* : similar ; the costal and hindmargins diffusely black.

Underside like upper. Head, thorax, and abdomen smoky cinereous ; abdomen below whitish.

Expanse of wings : ♂ 37 mm. ; ♀ 47 mm.

One ♂, one ♀, from Bogota.

Differs from typical *Tanaostyla* in having in both sexes veins 6 and 7 of hindwings coincident throughout, not stalked and furcate.

### 32. *Tithraustes impleta* sp. nov.

*Forewings* : smoky hyaline ; all the veins thickly and coarsely black ; costal and inner margins black, above the subcostal and below the submedian veins respectively ; apical third black, containing in it beyond cell a flattened oval pure white blotch ; the space immediately beyond cell between veins 6 and 7 and the marginal end of that between veins 2 and 3 is also clothed with white scales.

*Hindwings* : with veins black ; the costal, hind, and inner margins black ;

marginal ends of spaces above and below vein 5 whitish ; the fork between veins 3 and 4 on both wings is filled up with black scales.

Underside like upper. Face and palpi black ; cheeks white ; thorax and abdomen cinereous : an orange spot on side of each shoulder in front ; abdomen beneath pale.

Expanse of wings : 40 mm.

One ♀ from Colombia.

### 33. *Tithraustes moerens* sp. nov. and ab. *condensata* nov.

*Forewings* : smoky blackish, the basal area semihyaline, with the veins black ; a large irregularly oblong white blotch beyond cell, and a smaller round one at anal angle ; two small white spots before hindmargin beyond cell.

*Hindwings* : with the hindmargin broadly black ; the veins black ; a white blotch beyond cell, with a fainter one below it.

Underside similar ; the hindwings with a whitish streak on submedian fold and at base of cell. Face whitish, with the centre vertically grey ; palpi externally blackish ; thorax and abdomen blackish ; base of patagia yellow ; underside of abdomen white.

Expanse of wings : ♂ 35 mm. ; ♀ 37 mm.

One ♂, one ♀, from Cachabí, Ecuador, low country, Jan. 7th, 1897 (Rosenberg). Three ♂♂, two ♀♀ from Paramba, dated May 1897, dry season, are much more suffused with smoky, all the white blotches being reduced in size ; to this aberration the name *condensata* may be given.

### 34. *Tithraustes picata* sp. nov. and ab. *intersecta* nov.

♂ *Forewings* : white ; costal, inner, and hindmargins narrowly blackish ; an oblique blackish streak from middle of costa, including the discocellular, along vein 3 to the hindmargin above anal angle ; vein 2 thickened towards the margin and connected with 3 by a transverse streak ; apical area black, with two, sometimes three, oval white spots ; the veins and folds often black.

*Hindwings* : with costal and hindmargins black and all the veins black.

Underside duller. Face, palpi, and vertex white ; thorax blackish ; base of patagia yellow ; abdomen blackish above, white beneath.

♀ with the white spaces purplish hyaline, the large postmedian blotch alone whiter and larger ; the two apical spots much reduced.

Expanse of wings : 30-35 mm.

Many of both sexes from Cachabí, Ecuador, low country, January 1897 (Rosenberg), also one ♂ from above Chimbo, August 1897 (Rosenberg).

ab. *intersecta* nov. One ♀ has the large white blotch much reduced, the black from the apical area encroaching upon it, and the veins across it blackish, so that it forms a narrow quadrilobate fascia ; the two apical spots, on the contrary, are as large and as white as in the ♂♂.

## SUBFAMILY DYSPHANIINAE.

### *Xanthoxena* gen. nov.

*Forewings* : with costa uniformly curved ; apex rounded ; hindmargin strongly curved, more oblique below ; anal angle distinct.

*Hindwings* : with hindmargin well-rounded and faintly protuberant in middle ; anal angle rectangular.

Antennae (♀) well pectinated; palpi slender, short, porrect; frenulum apparently absent.

*Neuration*: forewings; cell not half as long as wing; discocellular oblique; first median nervule at two-thirds, second and third stalked; lower radial from near the top end of discocellular; upper radial stalked with the 5 subcostals; 11 anastomosing for a considerable distance with 12; hindwings with costal only shortly approximated to subcostal; 3, 4, and 6, 7, stalked; radial from near top end of discocellular.

Type: *Xanthoxena imitans* sp. nov.

The type species, except that the wings are shorter and broader, strongly resembles those of the genus *Smicropus* in the *Cyllopodinae*. But, coloration apart, there really seems to be no affinity between them. I cannot detect any trace of a bar between costal and subcostal of hindwings, nor of a frenulum; and as the neuration is identical with that of the subfamilies *Dysphaniinae* and *Geometrinae*, I see nothing for it but to refer it to the former, incongruous as its position may appear. The pectination of the ♀ antennae in these subfamilies is nothing unusual. It may be placed next the Papuan genus *Dyschema* Warr., with which in fact it has several points in common.

### 35. *Xanthoxena imitans* sp. nov.

*Forewings*: bright yellow; fringe and hindmargin black, more broadly at apex; costa diffusely black, the black narrowing at base and beyond middle.

*Hindwings*: bright yellow, with black margin from before apex, where it starts narrow, to anal angle, where it is broadest.

Underside the same. Head, thorax, and abdomen all yellow; antennae and tips of palpi black; body beneath and legs yellow; the tarsi fuscous grey.

Expanse of wings: 32 mm.

Two ♀♀ from Cachabí, Ecuador, low country, January 1897 (Rosenberg).

### SUBFAMILY GEOMETRINAE.

#### 36. *Aplodes pallida* sp. nov.

*Forewings*: pale yellowish green, without any markings; costa white, tinged with red at base.

*Hindwings*: paler; fringes of both wings concolorous.

Underside similar. Face and palpi ochreous green; thorax and abdomen green; vertex and shaft of antennae white.

Expanse of wings: 14 mm.

One ♂ from the island of Bonaire, July 1892 (E. Hartert).

#### 37. *Auophylla ambusta* sp. nov.

*Forewings*: deep green; costal area above subcostal vein yellowish ochreous, speckled with brown; a pale ochreous unspeckled cell-spot touching it just before the middle, which reaches only half across the cell; marginal area yellowish ochreous, filled with brown striae, which in places are confluent; the inner edge of this marginal border is sinuous, forming two outward curves, one between veins 6 and 7, the other between veins 2 and 4; the edge itself is ochreous, unspeckled; a small brown blotch before apex; fringe dark brown.



*Hindwings* : without cell-mark; the marginal border starts from two-thirds of costa and forms a sinus between veins 2 and 4, and another on submedian fold, running up inner margin for one-fourth; a brown-black shade runs from apex to anal angle, strongly marked at apex; brown striae as in forewings; fringe brown.

Underside yellow-green; costa of forewings tinged with reddish; a black-brown marginal streak from anal angle towards apex; a black-brown apical spot on hindwings. Head, thorax, and abdomen greenish; abdomen with black-brown crests.

Expanse of wings : 26 mm.

One ♂ from Palma Sola, Venezuela, 1896 (Whyman); near to *A. sarptaria* Moeschl., but that has yellow fringes.

### 38. *Auophylla invasata* ab. *perrupta* nov.

Differs from the type form in the lower portion of the pale marginal border of forewing being much narrower, the green of the central area reaching to two-thirds of inner margin and becoming confluent with the apical area, the pale streak from the costa reaching only as far as the median vein. All else as in the type.

Three ♀ ♀ from Palma Sola, Venezuela, where also the type form occurs.

It may be noticed that this species does not agree with the type of the genus in neuration, 6, 7, 8, 9, 10, 11 being all stalked together, 11 anastomosing, sometimes more strongly than at others, with 12, and 10 rising after 7; veins 3 and 4 are short-stalked in both wings.

### *Dichorda* gen. nov.

*Forewings* : broad; costa slightly curved; hindmargin curved, more obliquely below.

*Hindwings* : broad; hindmargin rounded; innermargin long; anal angle square.

Antennae of ♂ with delicate pectinations to three-fourths; palpi porrect, rough-haired, terminal joint short; frenulum extremely fine.

*Neuration* : forewings, cell less than half the length of wing; discocellular concave, more oblique below; first median nervule at three-fourths, second shortly before third; lower radial from above middle of discocellular, upper from the deflexed end of cell; 7, 10, 8, 9, stalked from close before end; 11 anastomosing with 12; hindwings, costal approximated to subcostal near base only; 6 and 7 hardly stalked; medians as in forewings.

Type: *Dichorda iridaria* Guen. (*Geometra*).

### 39. *Dichorda allineata* sp. nov.

*Forewings* : greyish green, with two whitish lines, the first very fine and indistinct, slightly waved, at one-third, the second, faintly curved, from apex to two-thirds of inner margin; cell-spot small but distinct, black; fringe concolorous.

*Hindwings* : with a straight white median line and black cell-spot.

Underside mealy whitish green, with the cell-spots black. Thorax and abdomen green; vertex white; antennae ochreous; face whitish green; palpi speckled with fuscous.

Expanse of wings : 22 mm.

One ♂ from Palma Sola, Venezuela.

Forewings with costa curved; apex slightly produced; hindmargin faintly sinuous; hindwings triangular with innermargin very long; hindmargin nearly straight till towards anal angle, then curved; scaling fine; the scales pale with dark tips, arranged so that they form numerous pale and dark green transverse wrinkled lines.

**Drucia** gen. nov.

*Forewings* : with costa slightly curved; apex produced; hindmargin oblique, hardly curved, slightly indented above anal angle which is well-marked.

*Hindwings* : with apex rounded and anal angle rectangular; a decided tooth at vein 4, the hindmargin sinuate above, straight below to anal angle.

Antennae pectinated in both sexes; palpi porrect, the terminal joint slender, much longer in ♀ than in ♂; tongue and frenulum present; abdomen with tufts of red scales.

*Neuration* : forewings, cell half as long as wing; discocellular vertical above, strongly concave below; first median at two-thirds, second close to third; lower radial from the bend in discocellular, upper from top angle of cell; veins 10, 7, 8, 9, stalked from the angle; 11 free, osculating or anastomosing with 12; hindwings, discocellular with lower half oblique; veins 6, 7, and 3, 4 stalked.

Type : *Drucia delphinata* sp. nov.

*Racheospila asmura* Druce also belongs here.

The genus agrees both in structure and shape of wings with *Progonodes* Warr., but the scaling and markings are quite dissimilar.

**40. *Drucia delphinata* sp. nov.**

*Forewings* : green; the costa pale ochreous with brown freckles; cell-spot black; a horseshoe-shaped mark on hindmargin from apex to vein 4, cream-colour washed with flesh pink, edged with red-brown, with red-brown specks in it, and with a faint shade across middle; a similar smaller blotch before anal angle, narrowed to hindmargin; marginal line red-brown, darker brown and forming triangles beyond the subapical blotch; fringe cream-colour chequered with pink.

*Hindwings* : with a large oblong blotch at apex reaching to the tooth at middle; a square blotch at anal angle, narrowing above at middle of inner margin, then swelling into a semi-oval shape to near base; no cell-spot.

Underside pale sea-green, with the blotches showing dull white. Head, palpi, and antennae dull red; thorax green; abdomen ochreous, with reddish dorsal crests.

Expanse of wings : 28 mm.

One ♂ from Sao Paulo. Allied to *D. asmura* Druce (*Racheospila*) from Panama.

**41. *Gelasma hemithearia* sp. nov.**

*Forewings* : dull grey-green, or olive-green; the lines slightly paler, the teeth marked by whitish points on the veins; first from one-fourth of costa to one-third of inner margin, angled outwards in cell and on submedian fold, followed by a deeper green tinge; the second from three-fourths of costa to three-fourths of inner margin, incurved beyond cell and on submedian fold, projecting on veins 3 and 4, preceded by deeper green; costa ochraceous, with purplish speckles; cell-spot

obscure, diffuse, deeper green ; marginal line purplish, interrupted by pale spots at the ends of the veins ; fringe whitish, broadly chequered with purplish grey spots beyond veins.

*Hindwings* : without first line.

Underside greenish white ; the forewings more or less suffused with ochraceous, the costa broadly ochraceous ; marginal spots purplish ; cell-spots in the ♀ somewhat rufous tinged. Face and palpi reddish brown above ; vertex white ; thorax and abdomen greenish ; the abdomen dorsally marked with reddish grey scales.

Expanse of wings : ♂ 19 mm. ; ♀ 25 mm.

One ♂ from Santos ; one ♀ from Sao Paulo ; the ♂ yellower green, the ♀ greyer. Neuration : forewings, cell less than one-half of wing ; first median close before end, second and third long-stalked ; lower radial from above centre of discocellular ; upper stalked with 7, 8, 9, 10, from upper angle ; 11 close before end, anastomosing with 12. Hindwings : with 3, 4, and 6, 7 stalked.

Except for the ♂ antennae, the species might easily be mistaken for a *Hemithea*.

#### 42. *Hydata malina*.

*Aplodes malina* Bntler Tr. E. S. 1881, p. 330. ♂.

In a ♀ from Paramba which answers well to the original description of this insect, the palpi are very slender and porrect, the third joint twice the length of the second ; the antennae are laterally flattened with thick close clavate teeth, the shaft white, the teeth themselves ochreous. The neuration is the same as in *subfenestraria* Wlk. = *satisfacta* Wlk.—the type of the genus *Hydata*. The chief characteristics of this genus are the anastomosis of the costal and subcostal of hindwings, exactly as in the *Hydriomeninae* and in many African genera of *Geometrinae* ; veins 6 and 7 are on a very long stalk, separating only a little before the hindmargin. In the forewings vein 11 becomes coincident with 12.

#### 43. *Iodis* (?) *longipalpis* sp. nov.

*Forewings* : dull sea-green ; the costa ochraceous, marked with purplish flecks ; the lines marked merely by white dots on the veins : first at one-third, second at two-thirds, outcurved beyond cell ; cell-spot whitish, obscure ; a dark purplish marginal line, interrupted by white dots at the end of the veins ; fringe green (?).

*Hindwings* : similar, but without first line, and the cell-spot more conspicuous.

Underside uniform whitish green, in the forewings faintly rosy tinged. Face and palpi red-brown ; vertex whitish ; thorax and abdomen green.

Expanse of wings : 23 mm.

One ♀ from Palma Sola, Venezuela.

Remarkable for the very long palpi, even for a ♀.

In the absence of a ♂, I have queried the genus. The ♀ shows no trace of a frenulum.

#### *Lissochlora* gen. nov.

*Forewings* : triangular ; costa nearly straight, curved before apex ; apex prominent ; hindmargin oblique, but little curved.

*Hindwings* : kite-shaped, both angles well marked ; hindmargin hardly curved, with a very faint elbow in middle.

Antennae of ♂ bipectinate, of ♀ simple; palpi porrect, long; second joint squamose, third as long as second, smooth, spatulate; tongue and frenulum present.

*Neuration*: forewings, cell two-fifths of wing; discocellular oblique below; first median at two-thirds, second at nine-tenths; lower radial from upper two-thirds, upper from top of discocellular; 7, 8, 9, 10 stalked, 11 free; 10 rising close to origin of 8, 9. Hindwings with costal approximated to subcostal for a perceptible distance; 6 and 7 stalked.

Type: *Lissochlora flavifimbria* Warr. (*Aplodes*).

*Aplodes nortia* of Druce probably belongs here.

#### 44. *Lissochlora incognita* sp. nov.

*Forewings*: apple-green; costa white, tinged with red at base; an outer curved line at two-thirds, indicated merely by white dashes on the veins; fringe yellowish, the basal half deeper than the apical; a pink spot at the apex of wing.

*Hindwings*: with a minute dark cell-dot, and some reddish scales at base of fringe.

Underside more whitish green, the outer line appearing as a dark green shade; costa of forewings yellowish. Face pale ochreous, fillet and antennae white; vertex and thorax green; abdomen ochreous.

Expanse of wings: 30 mm.

One ♀ from the Felder collection, without locality, but almost certainly from S. America.

#### 45. *Microloxia dilucida* sp. nov.

*Forewings*: pale green, thinly scaled; costal edge white; two oblique white lines, first from two-fifths of costa to one-third of inner margin, acutely angled on the subcostal vein; second from close before apex to four-fifths of inner margin; fringe white; cell-spot absent.

*Hindwings*: with the two lines and fringe white.

Underside pale green, the lines showing through; forewings yellowish green towards costa, the base of which is tinged with reddish. Face green above, whitish below; palpi pale, externally tinged with reddish; fillet and antennae white; vertex, thorax, and basal half of abdomen green; terminal half of abdomen whitish.

Expanse of wings: 17 mm.

One ♂ from S. Paulo.

As the five species of *Microloxia* from S. America at present described bear considerable superficial resemblance to each other, a tabular arrangement is here given for their discrimination:—

A. outer line of forewings curved: *fringillata* Schaus.

B. both lines straight and parallel.

a. face green: *dilucida* Warr.

b. face reddish.

a'. forewing with red apical spot: *apicata* Warr.

b'. forewing without red apical spot: *bistriata* Warr.

C. first line oblique outwards: *mollissima* Dogn.



46. *Microloxia apicata* sp. nov.

*Forewings* : bright apple-green ; costal streak, two oblique straight transverse lines, veins towards hindmargin, and fringe white ; basal half of fringe ivory-white ; a small brownish cell-spot and a brown-red spot at apex in the fringe ; first line from two-fifths of costa to one-third of inner margin ; outer line near margin.

*Hindwings* : with the two lines and fringe white.

Underside shining greenish white, the lines showing through ; costal half of forewings yellowish green ; costal fringe white ; costa at base brown-red ; apical fringe brown-red. Face and palpi deep bright red ; palpi below and two spots on lower half of face whitish ; fillet, upper part of face, and antennæ snow-white ; vertex and thorax green ; abdomen discoloured, probably greenish white.

Expanse of wings : 26 mm.

One ♂ from Nova Friburgo, Brazil.

Closely allied to *M. bistrata* Warr., from S. Paulo.

47. *Oospila concinna* sp. nov.

Differs from *O. albicoma* Feld. in the following points : the apical and anal blotches are not separate, but united by a pale space along the marginal line ; the anal blotch does not reach to the lower radial and is more rounded, having no angular projection towards the apical blotch ; the edges of the blotches and the striae within them are dull purple. In the hindwings the oval blotch on inner margin is reduced to a mere shallow streak, and the course of the subcostal vein is marked by silvery white scales as well as the upper part of the discocellular ; the hindmargin is somewhat abruptly elbowed at vein 6 ; thorax purplish grey ; patagia green with the tips violet.

Expanse of wings : 50 mm.

Nine ♂♂, one ♀ from Merida, November 1898, April 1899 (Briceno).

48. *Oospila congener* sp. nov.

*Forewings* : semi-transparent sea-green, with purple-grey markings : viz. an oblique cell-patch, and apical and anal blotches ; the apical blotch rises finely from apex and swells out between veins 7 and 4, as in *O. hyalina* Warr.

*Hindwings* : with a sinuous apical blotch and a rounded one at anal angle ; a purplish grey spot at lower end of cell, and a white raised spot at top of discocellular ; the fringe in both wings is entirely wanting.

Underside uniform opaline.

Face worn, apparently pale green with purplish scales at top ; palpi and forelegs whitish, with dark external scales ; vertex and shaft of antennae white ; antennal pectinations ochreous ; collar, shoulders, and base of patagia green ; rest of patagia, thorax, and base of abdomen purple-grey ; abdomen green with five purple-grey metalline dorsal crests ; anal tuft pale.

Expanse of wings : 32 mm.

One ♂ from Rio Demerara, British Guiana, July 1897.

Differs from *O. hyalina* in having the markings purple-grey instead of red-brown ; and from *violacea* Warr. in the markings of the hindwings.



**Racheolopha** gen. nov.

In his genus *Racheospila* Guenée included species having white red-edged spots on the dorsum and those bearing crests of scales. The majority of his species belong to the first of these groups, and in these the antennae of the ♀♀ are simple. In his description of *R. aggravaria*, made from a ♀, he remarks on the pectination of the antennae, and suggests that it may form an exception in the genus. The abdomen of this species he makes to have three white crests. Of the only other species described by him as possessing crests, *Miccularia*, he knew the ♂ only; the ♀ has, like *aggravaria*, pectinated antennae. For these species I propose the name *Racheolopha*, with *miccularia* as type. The two species described by me (Nov. Zool. IV. pp. 430 431) as *Racheospila jaspidata* (♀) and *rosipara* (♂) having crested abdomens (*jaspidata* having pectinated antennae as well) should be transferred to *Racheolopha*. The cell is shorter than in *Racheospila*; veins 3, 4 of forewings are shortly stalked, and the upper radial generally stalked with 10, 7, 8, 9.

49. **Racheolopha flavicincta** sp. nov.

*Forewings*: pale green; the costa towards base reddish ochreous; a small black cell-spot; on the hindmargin below, apex extending from above vein 7 to below vein 4 is a large horseshoe-shaped red-brown blotch edged with yellow; marginal line and fringe rufous, the line slightly swollen at anal angle.

*Hindwings*: with a pear-shaped apical red-brown blotch extending to vein 4, and a semi-elliptical one at base of inner margin, both edged with yellow; cell-spot and fringe as in forewings.

Underside whitish green with the apical blotches showing through detached from the margin. Head and antennae red; thorax green; abdomen above greenish speckled with red, with five red crests of hair, the first three also with metallic scales.

Expanse of wings: 36 mm.

One ♀ from Palma Sola, Venezuela.

Antennae of ♀ pectinated; hindmargin of hindwings bent at veins 4 and 6, straight between.

50. **Racheolopha similiplaga** sp. nov.

♀ *Forewings*: apple-green, with a small black cell-spot; a brown marginal line, swelling out into a small brown blotch beyond cell and a larger one at anal angle, both edged with yellow; fringe pale, chequered with brown.

*Hindwings*: with a red-brown semicircular blotch at apex and a smaller triangular one at anal angle; a red-brown marginal line; fringe as in forewings; cell-spot obsolete.

Underside pale glossy green, with the large brown patches showing through. Palpi greenish, with apex reddish; face dull red; vertex and thorax green; abdomen ochreous, with red-brown metallic dorsal crests.

♂ with no marginal blotch in forewings opposite the cell and none in hindwings at anal angle; cell-spot of hindwings minute.

Expanse of wings: 26 mm.

One ♀ from N. Friborgo; one ♂ without locality.

In the forewings vein 11 is stalked with 6, 10, 7, 8, 9.

51. *Racheospila alboseriata* sp. nov.

*Forewings*: delicate green, semi-transparent; costa finely white, with a red streak beneath it near base; inner and outer lines represented by white dashes on the veins; fringe white with a slight red line at base; cell-spot red-brown.

*Hindwings*: the same.

Underside whitish green; costal area of forewings deeper green; the costa itself rather broadly reddish at base. Face red-brown, mixed with white below; palpi red-brown above, whitish underneath; vertex and shaft of antennae snow-white; collar red; shoulders and patagia green; abdomen ochreous white, tinged with green, especially towards base; dorsum with three white red-edged blotches.

Expanse of wings: 30 mm.

Five examples, including both sexes, from Merida, Venezuela (Briceno).

A more delicate insect than *R. alboeiliaria* H. S.

52. *Racheospila isolata* sp. nov.

*Forewings*: pale semi-transparent green with a bluish tinge; costa narrowly white with a red-brown streak at base; a small red-brown cell-spot, and red-brown marginal line, running round along costa for a short distance, swelling out into a horseshoe-shaped spot between veins 4 and 5, and into a shallow blotch at anal angle; fringe white, chequered with red-brown; very faint antemedian and postmedian denticulated white lines.

*Hindwings*: similar, with a shallow blotch at apex also.

Underside pale silvery green. Face, palpi, and collar reddish; vertex and thorax green; abdomen ochreous dusted with reddish, with red-edged white dorsal spots.

Expanse of wings: 26 mm.

Two ♀♀ from New Grenada.

The antennae are not pectinated, but serrate. In the forewings the first median rises at four-fifths, the second and third are short-stalked: veins 7, 8, 9 rise much further than usual, 8 and 9 separating quite close to costa.

53. *Racheospila parvipuncta* sp. nov.

*Forewings*: very pale green, the costa whitish; two fine pale lines; the first before one-third, bent on the median vein; the second beyond two-thirds, slightly curved outwards in upper half, denticulate on the veins; cell-spot minute, ferruginous; fringe yellowish.

*Hindwings*: the same, without first line.

Underside pale whitish green. Vertex and thorax pale green; abdomen whiter with slight red dorsal spots; face and palpi above and externally dull red.

Expanse of wings: 28 mm.

Two ♀♀ from Rio Demerara, East Coast.

Like *R. carbina* Druce, from Mexico, but smaller.

54. *Racheospila purpureotincta* sp. nov.

*Forewings*: semi-transparent delicate green; the lines marked by violet dashes on the veins, the lines themselves faintly darker green, lunulate; first at one-third, slightly curved; second at about two-thirds, excurved round cell, incurved below

the median and approaching first line on inner margin ; both lines with the costal and inner marginal spots blurred violet, the intermediate dashes each concisely tipped with white ; cell-spot large and blurred, with a deeper violet centre ; costa at base violet ; a very fine violet marginal line ; fringe white with faint violet dots beyond veins.

*Hindwings* : without first line.

Underside pale green, slightly yellowish tinged ; costa and cell-spot of forewings dull violet. Face and palpi white beneath, brown above ; vertex white ; thorax and abdomen green, abdomen with snow-white dorsal spots.

Expanse of wings : ♂ 24 mm. ; ♀ 30 mm.

Two ♂♂ 1 ♀ from Palma Sola, Venezuela. Also 1 ♂ from Paramba, Ecuador.

#### 55. *Racheospila remota* sp. nov.

Of the same size and shape as *R. dentilinea* Warr., but the fringe yellowish green, without red basal line or brown flecks ; the exterior white line farther from the hindmargin, straighter and scarcely crenulate, not denticulate, the inner line also white ; no trace of olive shading ; the cell-spots of both wings black.

One ♂ from Azahar de Carthago, Costa Rica, 5000 to 6000 ft. (Underwood).

#### 56. *Racheospila rufiguttata* sp. nov.

*Forewings* : yellowish green, the costa finely white, tinged at base with red-brown ; the two lines marked by rather large brownish red spots, those on costa, subcostal vein, and vein 7 forming a small blotch ; cell-spot large, brown-red ; marginal line finely red, interrupted at the vein-ends ; fringe yellowish white.

*Hindwings* : without first line of spots.

Underside whitish green, with a yellowish tinge. Face brown, mixed with white scales in middle ; palpi whitish, brown above, the terminal joint brown ; vertex and thorax worn ; abdomen ochreous, green-tinged towards base, with three white, red-edged blotches on dorsum.

Expanse of wings : 37 mm.

One ♀ from Merida, Venezuela (Briceno).

Distinguished from *albociliaria* H. S. by the wholly pale fringes, not intersected with red ; larger and coarser than *albo seriata* Warr., the cell in both wings decidedly shorter.

#### 57. *Racheospila sigillaria* Guen. ab.(?) *intensa* nov.

Like typical *sigillaria*, but the vinous-purple line which precedes the marginal white festoon swollen into a purple shade, which at anal angle of both wings and towards apex of hindwings becomes a blotch ; the purple streak below the white costal edge also broader ; the abdomen much more broadly and deeply red, this colour also embracing the whole of the metathorax, which is usually green.

The example described was sent along with a ♂ of the ordinary form from Palma Sola, Venezuela, 1896, and is probably only an aberration. As a rule the ♀ does not differ from the ♂.

*Neuration* : as in *R. isolata*, but the upper radial is stalked with 10, 7, 8, 9.

58. *Rhodochlora discipuncta* sp. nov.

*Forewings* : very pale yellowish green, without any markings, except a bright red cell-spot ; fringe concolorous.

*Hindwings* : the same.

Underside the same, without cell-spots ; antennae ochreous, shortly pectinated. Face and palpi whitish brown ; vertex white ; thorax and abdomen concolorous with wings.

Expanse of wings : 32 mm.

One ♂ from La Paz, Bolivia, October 1895 (M. Stuart).

59. *Tachyphyle undilineata* sp. nov.

*Forewings* : rather deep green, with numerous olive-brown transverse strigae ; the lines of the same colour ; first at one-fourth, waved, convex outwards above and below the median ; outer line from three-fourths of costa to two-thirds of inner margin, irregularly waved ; cell-spot brown.

*Hindwings* : as forewings, with one central line waved.

Underside whitish green ; forewing with dark cell-spot.

Face and palpi ochreous (probably faded from green), terminal joint of palpi fuscous ; vertex and antennae white ; thorax and abdomen green.

Expanse of wings : 37 mm.

One ♂ from Rio Demerara, British Guiana.

*Telotheta* gen. nov.

*Forewings* : triangular ; costa nearly straight ; apex prominent ; hindmargin obliquely curved ; costa at base with rough hairs.

*Hindwings* : with apex rounded, and anal angle rectangular ; hindmargin rounded, with a slight bend at middle.

Antennae of ♂ pectinated, of ♀ serrate, pubescent, short ; palpi of ♂ short, perfect, of ♀ very long ; second joint sparsely haired above, third slender and smooth, quite as long as second. Tongue present ; frenulum of ♂ fine, of ♀ invisible.

*Neuration* : forewings ; cell two-fifths of wing ; discocellular vertical ; first median nervule at three-fourths, second and third stalked ; vein 5 from upper half of the discocellular ; veins 11, 6, 10, 7, 8, 9, stalked together and rising in the order given, 6 in the usual place of 7, and 7 close to 8 and 9 ; hindwings, with the two subcostals on a very long stalk, separating shortly before hindmargin ; radial and medians as in forewings ; scaling and structure generally very delicate.

Type : *Telotheta chlorostigma* sp. nov.

60. *Telotheta chlorostigma* sp. nov.

*Forewings* : green, covered with very fine whitish striations ; cell-spot diffuse, darker green ; fringe concolorous ; costa yellow.

*Hindwings* : similar ; both wings rather darker green along hindmargin.

Underside whitish green ; base of costa of forewings bright rosy. Face, third joint of palpi, and forelegs bright red ; antennae and vertex white, the latter tinged with pale green ; thorax green ; abdomen ochreous green with dorsal and lateral red lines.

Expanse of wings : 24 mm.



One ♀ from Chimbo, Ecuador, August 1897, 1000 ft. (Rosenberg) ; one ♂ from Merida, Venezuela, October 1898 (Briceno).

This insect must be very close to *Geometra muscipunctata* Dogn. from Loja, which I have not seen ; but Dognin speaks of the face as "jaune-ochracé." The peculiar neuration separates it from all other species.

#### SUBFAMILY STERRHINAE.

##### 61. *Anisodes albipupillata* sp. nov.

*Forewings* : dark fawn-colour, with a slight reddish tinge; the markings precisely the same as in *A. globaria* Guen., *ordinata* Wlk., and *metaspilata* Wlk., but the discal spots different, being round and pure white, without a trace of darker edging.

*Hindwings* : with the cell-spot much larger, pure white, with a narrow dark edging.

Underside rosy with the white spots strongly showing through.

Expanse of wings : 32 mm.

One ♀ from S. America, without more precise locality.

This is very probably the form recorded by Guenée as *globaria* var. *A*.

It is extremely likely that this and the three species above mentioned are all four variant local forms of one and the same species, differing, as they do, only in the character of the cell-spots.

##### 62. *Anisodes bipartita* sp. nov.

*Forewings* : grey with a slight flesh-coloured tinge and finely dark-speckled ; basal line at one-fourth, very indistinct, angled in cell, and marked by dark dots on veins ; median shade dark grey, oblique, slightly sinuous, and towards costa subdentate, parallel to hindmargin, from two-thirds of costa to beyond middle of inner margin ; cell-spot ocelloid, indistinct, its centre of the ground colour ; exterior line marked by dark vein-dots, at five-sixths ; submarginal very indistinct ; a marginal row of black dots between the veins, and minute ones at the vein ends ; fringe concolorous.

*Hindwings* : like forewings, but with no basal line ; the cell-spot large, round, blackish, lying in the median shade, which is diffuse.

In both wings the area from base to median shade is paler than the marginal area, except a narrow band on which lie the dots of the outer line.

Underside rather darker ; the cell-spots of both wings large, round, and black. Face and palpi above dark brown, beneath pinkish ochreous ; vertex and fillet white ; collar reddish grey ; thorax and abdomen paler grey.

Expanse of wings : 35 mm.

One ♂ from Popayan, Colombia (Lehmann).

The forewings are narrow and elongate, with the hindmargin more oblique ; hindmargin of both wings subcrenulate, hardly projecting at vein 4.

##### 63. *Anisodes conferta* sp. nov.

*Forewings* : yellow, so thickly covered with rufous, fuscous and blackish transverse striae as only to show a small yellow space before and behind the black cell-spot, and a yellow lunulate submarginal line ; the usual three lines thick,



parallel to hindmargin, but almost lost in the dark striae ; small dark marginal spots between the veins ; base of costa rosy ; fringe rosy.

*Hindwings* : with costa broadly rosy, and the whole wing slightly suffused with the same hue ; five waved and curved dark transverse lines, the antemedian fine, the median thickest ; the other three indistinctly lunulate and separated by the pale yellow ground-colour ; cell-spot black.

Underside bright rosy, with only the marginal and inner areas yellow, the former traversed by a rosy line. Face and palpi yellow beneath, bright rosy above ; vertex, collar, and antennae yellow ; thorax and base of abdomen fuscous ; the shoulders tinged with rosy ; abdomen yellow with a rosy patch on the anal half.

Expanse of wings : 48 mm.

One ♂ from Jamaica.

The fringes are quite worn, but appear to have been yellow and rosy.

#### 64. *Anisodes costinotata* sp. nov.

*Forewings* : fawn-colour, dusted and tinged with vinous-red, most thickly along the costa ; the lines reddish tinged, all starting from dark fuscous marks on costa ; first at one-fourth, curved, marked by spots on veins and a darker spot in cell ; second at middle, somewhat squarely bent outwards round cell-spot which is vinous brown and distinct, then incurved to middle of inner margin ; outer line at three-fourths, oblique to vein 6, concave to vein 4, and denticulate to three-fourths of inner margin, marked by reddish dots on veins ; submarginal line itself indistinct, but starting from a larger irregular dark blotch on costa ; marginal spots reddish.

*Hindwings* : with an oval white cell-spot edged with vinous brown, and succeeded by an obscure reddish central shade ; a postmedian curved line marked by brown-red dots on the veins.

Underside paler ; cell-spots and outer lines marked ; costa of forewings darker, with all the costal blotches dark. Face and palpi above, and collar reddish fawn-colour ; face and palpi below, vertex, thorax, and abdomen paler fawn-colour.

Expanse of wings : 34 mm.

One ♂ from Popayan, Colombia (Lehmann).

Hindmargin of hindwings distinctly dentate, with a deeper excision between veins 4 and 6.

#### 65. *Anisodes ferruginata* sp. nov.

*Forewings* : deep ferruginous-orange, densely striated with darker ; costa brown ; the lines diffuse, darker ferruginous deepening into brown ; first at one-fourth, curved ; second, median, including the small round white dark-edged cell-spot ; outer line distinctly dentate exteriorly on the veins ; the submarginal cloudy ; a row of blackish marginal dots ; fringe concolorous.

*Hindwings* : similar ; the space between veins 3 and 4 on both wings somewhat darker.

Underside dull reddish ochreous, with the outer lines dull red. Face and palpi above deep ferruginous, paler below ; vertex and collar still darker ; thorax bright ferruginous like wings ; abdomen wanting.

Expanse of wings ; 40 mm.

One ♂ from Paramba, Ecuador, April 1897, dry season, 3500 ft. (Rosenberg).

Distinguished from all other species by its coloration.

66. *Anisodes insigniata* sp. nov.

*Forewings*: yellowish ochreous, thickly dusted with dark ferruginous, more especially along costa; the lines all ferruginous; first from costa at one-fifth, oblique outwards to median vein and apparently stopping short, its lower half running from median to inner margin much nearer the base; a strong thick ferruginous straight line from middle of costa to middle of inner margin, touching the oblique linear cell-mark; outer line from costa at two-thirds, oblique outwards to vein 6, then lunulate, vertical to vein 4, and strongly incurved below to inner margin just beyond middle line; submarginal line thick, curved parallel to hindmargin, interrupted below middle, and forming two lunulate ferruginous blotches above anal angle; marginal space traversed by an acutely zigzag line, the teeth on either side touching submarginal line and hindmargin, blotched in middle and at anal angle; veins all ferruginous; marginal line ferruginous; fringe ochreous.

*Hindwings*: the same, but the cell-spot represented by a large tridentate ferruginous-edged silvery patch.

Underside simply ochreous, with all the markings restricted. Face and palpi yellowish ochreous below, ferruginous above; vertex, thorax, and abdomen yellowish, speckled with ferruginous.

Expanse of wings: 38 mm.

One ♀ from British Guiana.

67. *Anisodes lichenea* sp. nov.

*Forewings*: pale lichen-grey, speckled with dark atoms, and tinged with olive; costa much speckled with fuscous, towards apex whitish, with three purple flecks; the lines obscure, marked only by vein-dots, and a little darker on costa; median shade olive, subdentate; cell-spot black-edged, with a minute pale centre; submarginal line pale, preceded and followed by darker-dusted shades, the former, as usual, slightly greyer below costa, beyond cell, and above anal angle; marginal dots dark purple between the veins; fringe whitish, with rosy flecks at end of veins.

*Hindwings*: similar; outer line of dots plainer, with a larger blotch at inner margin.

Underside deep dull rosy; the cell-spots dark; marginal line red; fringes yellowish. Face and palpi brown above, ochreous below; vertex white; thorax and abdomen grey like the wings; second segment of abdomen with a ring of purple specks.

Expanse of wings: 26 mm.

One ♀ from Jamaica.

Inner margin of hindwings shorter, anal angle more truncate, as in *illinaria* Guen., with which it corresponds generally in shape.

68. *Anisodes nigropustulata* sp. nov.

*Forewings*: ochreous, faintly tinged with darker ochreous or rufous, and with slight blackish dusting along the costal area; first line indicated by three rather large black spots placed in an oblique line, that on the subcostal at one-third, that on the submedian at one-fifth; preceded by three smaller spots, in a parallel line; one near base below median, the second above the subcostal, the third on costa; a minute dark spot in cell and on submedian fold beyond the first line; cell-spot

round, black, with grey centre ; followed by a diffuse greyish somewhat denticulate median shade ; outer line marked only by small vein-dots ; submarginal line preceded by six black blotches, a single one beneath costa and on vein 3, a double one beyond cell and in submedian interval, and followed by a darker ochreous shade, which is blackish beyond cell ; fringe ochreous, with a row of rather large black spots at base.

*Hindwings* : similar, but with the inner and outer lines of spots ending on inner margin in a black blotch.

Underside much paler, tinged with pale rosy ; the cell-spots and those preceding the submarginal line showing through. Head, thorax, and abdomen all ochreous ; the palpi externally fuscous.

Expanse of wings : 26 mm.

One ♂ from Tijuco, Brazil.

Related to *A. urcearia* Guen.

#### 69. *Anisodes ocularis* sp. nov.

*Forewings* : greyish straw-colour, very finely dusted with fuscous grey atoms ; the lines rather obscure, dark grey tinged with rufous, most distinct towards costa ; first at one-fourth, twice slightly curved outwards ; second at two-thirds, denticulate, starting from a dark costal spot, excurved round cell, then vertical to inner margin just beyond middle ; third, submarginal, at five-sixths, obliquely curved outwards to vein 7, vertical to vein 6, curved to vein 4, then oblique and straight to inner margin before anal angle, marked below middle only by vein-dots ; a double red apical blotch surrounded by grey scales ; cell-mark a large grey oval, with pale central point ; a marginal series of small black dots ; fringe concolorous.

*Hindwings* : with middle and outer line grey, the latter marked throughout by vein-dots ; cell-mark as in forewings, but with a deep black spot on the upper edge ; a small dark dot on median vein near base.

Underside very pale straw-colour, with only the outer line and marginal dots marked ; cell-marks linear, dark grey, that in the forewings with a pale central line. Face and palpi dull reddish ; vertex, thorax, and abdomen straw-colour.

Expanse of wings : 32 mm.

One ♂ from Palma Sola, Venezuela.

Hindwings with hindmargin distinctly toothed at middle.

#### 70. *Anisodes spissata* sp. nov.

*Forewings* : dark ochreous, suffused and very finely striated with dull ferruginous ; the lines also dull ferruginous ; the first curved and inbent on the submedian fold, from one-sixth of costa to one-fourth of inner margin ; median shade thick, from two-thirds of costa to two-thirds of inner margin, outwardly toothed on veins 3 and 6, and inwardly on vein 2 ; exterior line from three-fourths of costa to inner margin a little before the anal angle, innulate, the teeth marked slightly darker on the veins ; submarginal thicker and interrupted, toothed at veins 5 and 2, the teeth touching the hindmargin ; dark marginal spots between the veins ; the fringe paler ; cell-spot linear, ferruginous ; costa ferruginous.

*Hindwings* : similar, but the cell-spot oval, brown-edged, with a white centre.

Underside suffused with dull rosy, except along inner margins. Head, thorax and abdomen concolorous.

Expanse of wings : 32 mm.

Two ♀♀ from Rio Demerara, British Guiana.

Allied to *nebuligera* Butler and *nodigera* Butler.

#### 71. *Anisodes stramineata* sp. nov.

*Forewings* : pale straw-colour, densely sprinkled with brick-red and greyish olive atoms; the lines thickened with a greyish olive tint; first line at one-fourth, grey-tinted outwardly, preceded by a slight space free from speckles; median shade from just beyond middle of costa to middle of inner margin; outer line from four-fifths of costa to four-fifths of inner margin; both these dentate-lunulate and grey-edged inwardly, the outer line with the teeth prominently marked with blackish and followed by a narrow unspeckled space; a greyish marginal shade containing the very obscure pale submarginal line; cell-spot a flattened ring; marginal dots dark reddish black; fringe straw-colour.

*Hindwings* : the same, but the cell-spot larger, white, with a black edge; fringe with small reddish dots beyond the ends of veins as well as the spots on margin.

Underside duller; marginal spots and outer line represented on both wings, the forewings also with cell-spot and median shade, and the costa speckled; the markings all dull pinkish grey. Head, thorax, and abdomen straw-colour; palpi above rosy; face at top brownish.

Expanse of wings : 29 mm.

One ♀ from Paramba, Ecuador, 3500 ft., dry season, April 1897 (Rosenberg).

#### 72. *Anisodes subcarnearia* sp. nov. and ab. *grisea* nov.

*Forewings* : deep flesh-colour, much suffused and dusted with olive; all the lines olive; the inner and outer marked with the usual series of black vein-dots; median shade rather thick, externally subdentate; cell-spot round, black-edged, with grey or whitish centre; marginal dots black, small; fringe concolorous.

*Hindwings* : the same; the cell-spot large and black, with a minute white centre and ring of white scales round it within the black disc.

Underside deep dull rosy; the cell-spots blackish, linear; fringe rosy. Face dull red-brown; palpi brighter red; vertex, thorax, and abdomen concolorous with wings.

Expanse of wings : 26 to 28 mm.

Two ♀♀ from Sao Paulo (type) and Maraval; the latter brighter and paler red, with less olive suffusion.

A second ♀ from S. Paulo I shall for the present refer here as ab. *grisea*. Instead of being red, it is dull grey, with a slight pink tinge; cell-spots of both wings round and black, with a minute white central speck; abdomen grey, with a dorsal row of red dashes; underside pale whitish, with a rosy flush.

#### 73. *Anisodes subpallida* sp. nov.

*Forewings* : pale stone-grey, darker grey along the costa; inner and outer lines indicated by small vein-dots; central shade obscurely darker, slightly curved round the cell-spot, which is white, somewhat shining, without darker edging; submarginal line indistinctly paler, lunulate, preceded and followed by a darker shade, that which



precedes it being marked by dull blotches between the veins ; a row of small dark marginal dots ; fringe concolorous.

*Hindwings* : like forewings.

Underside glossy, whitish ; the forewings towards costa slightly flushed ; cell-spots and outer lines indistinctly expressed. Head, thorax, and abdomen all grey ; the abdomen tinged with reddish on back ; palpi and forelegs rosy above ; face rather darker at top.

Expanse of wings : 28 mm.

A pair from Petropolis, Brazil.

A rather dull and inconspicuous-looking insect.

#### 74. *Anisodes tenera* sp. nov.

*Forewings* : pale fawn-colour, with delicate darker strigulae ; the inner and outer lines marked by vein-dots only, at one-fifth and four-fifths respectively ; cell-spot distinct, blackish, with a minute white speck in centre ; central shade dark fawn, irregularly dentate externally, the space between it and basal line filled in with the same colour ; a marginal row of dark spots, but no submarginal line ; fringe concolorous.

*Hindwings* : exactly the same.

Underside much paler, almost whitish ; costal region of forewings tinged with rufous ; the cell-spots large and dark, elongated. Head, thorax, and abdomen all concolorous.

Expanse of wings : 26 mm.

One ♂ from Corcovado, Rio Janeiro.

The dark suffusion between inner and median line is fainter towards inner margin of forewings and costal margin of hindwings.

#### 75. *Anisodes urcearia* ab. *diffusa* nov.

In Guenée's type form the transverse lines are fine, and the vein-dots by which they are marked decidedly darker than the lines themselves ; Guenée, indeed, calls them black, but they are really a very deep red. In the form before me the whole surface of both wings is much more densely dusted with red scales than in the usual paler examples ; the cross lines are much thicker and more diffuse, and, instead of the darker vein-dots, the edges of the lines are merely marked with deeper red ; and similarly the dark blotches below the costa, opposite the cell, and above the anal angle, which precede the pale submarginal line, as well as the marginal spots, are in this case deep rosy. The underside of both wings is proportionally more deeply suffused with red.

One ♀ from Rio Demerara, British Guiana, of the same size as those of the type-form from the same and other localities.

#### GENUS ANTEOIS nom. nov.

At page 308 of his Verzeichniss, Hübner placed four species under *Eois*, viz., *auroraria*, *ostrina*, *russearia*, and *politaria* ; of these the first, second, and fourth had been previously figured by him under the head of *Geometra*, while the third had not only been figured but described by him in the Zuträge (p. 27. n. 78 [1818]) as *Eois russearia*. It follows, I think, that *russearia* is the type of *Eois* ;



and that this name must supersede Guenée's *Cambogia*, at all events for those species which, like *russearia*, have antennae in the ♂ not pectinated, but ciliated only. For those with pectinated antennae the name *Cambogia* will stand.

The generic term *Eois*, therefore, cannot be applied to any group of *Sterrhinae*. The group to which it has hitherto been referred is a large one, and will ultimately have to be subdivided. I am not at present prepared to say whether any or which of the other generic terms applied to species of the group should be used instead of *Eois*; but as some name must be employed I propose that of *Anteois* provisionally (type of genus: *A. muricata* Hfn.).

#### 76. *Anteois mellea* sp. nov.

*Forewings*: deep yellow; costa for two-thirds purple-brown; a slightly marked purple line near base; an indistinct sinuous median line; a distinct sinuous outer line, followed by an interrupted submarginal line, containing two more strongly marked spots below middle and another at anal angle; fringe yellow, not separated from wing by any line.

*Hindwings*: the same, without basal line.

Underside paler. Face, palpi, and thorax purple-brown, glossy; vertex and antennae white; abdomen yellow ringed with red.

Expanse of wings: 15 mm.

Several from Sao Paulo, Brazil.

#### 77. *Anteois obliquaria* sp. nov.

*Forewings*: dull whitish, slightly tinged with rufous and dusted with grey atoms; the lines grey, all oblique and parallel to the very oblique hindmargin; the first thick, from before middle of inner margin, the second from the middle, third and fourth finer, the third subdentienlate; all four lines are more or less obliterated before reaching the costa; fringe pale grey, with darker base.

*Hindwings*: whiter, with traces of four lines, most distinct on inner margin.

Underside like upper. Head, thorax, and abdomen concolorous with wings.

Expanse of wings: 16 mm.

Five ♀♀ from Caicara, Orinoco, April 1898 (Cherrie).

The costa and hindmargin of forewings are both straight, the apex acute; the insect reminds one of *Anteois triangularis* Warr. (*Ptychopoda*), but that species has the wings still more elongate, and grey not whitish in colour, the lines still more oblique.

#### 78. *Anteois sulphuraria* sp. nov.

*Forewings*: very pale sulphur-yellow, faintly and irregularly sprinkled with brownish; the costal area especially marked with brownish scales; no lines visible; fringe yellowish.

*Hindwings*: with very obscure traces of antemedian and postmedian lines.

Underside glossy, pale yellow, with the costa of forewings broadly rufous. Face black-brown; vertex, thorax, and abdomen like wings.

Expanse of wings: 15—16 mm.

One ♂, one ♀ from Chimbo, Ecuador, August 1897 (Rosenberg).

The antennae of the ♂ are subserrate, with very long curling cilia. The

hindwings have the hindmargin strongly excised beyond cell and subcrenulate to anal angle ; veins 6, 7, and 3, 4 stalked ; the cell short.

The species bears a striking resemblance to *Craspedia rasa* Warr. described further on.

#### GENUS : ASEILLODES Guen.

The species of this genus must be referred to the subfamily *Sterrhinae*. In both sexes vein 8 of the hindwings touches 7 near base and then diverges to the costal margin. Cell about half as long as wing ; discocellular with a short vertical upper area, and obliquely curved lower portion ; the lower radial from the angle at their junction and therefore much nearer 6 than 4. First median nervule at two-thirds, second at eight-ninths ; upper radial from upper angle of cell ; 7, 8, 9 stalked from three-fourths ; 10 and 11 stalked from one-half, 10 anastomosing with 8, 9. In the hindwings of ♀ veins 6, 7 are stalked, the rest as in forewings. In the ♂ the subcostal vein is nearly in the middle of the wing ; the two subcostal nervules stalked and very divergent ; the radial runs obliquely into the excision before anal angle, and the three median nervules are obscured, the submedian fold forming a strong furrow on the upper side, projecting and fringed with hairs below. The hindtibiae and tarsi in the ♂ are quite aborted and hidden by dense hairs. (Guenée must have mistaken the middle tibiae for the hind ones).

#### *Calyplocome* gen. nov.

*Forewings* : with costa nearly straight ; apex prominent, bluntly rounded ; hindmargin oblique, curved towards anal angle.

*Hindwings* : with hindmargin well rounded, inner margin long ; anal angle squared.

Antennae of ♂ with the joints triangular, subserrate beneath, with long ciliations. Palpi quite short, not reaching front of face ; hindtibiae of ♂ aborted, without spurs, and with a pencil of hairs ; of ♀ with three spurs.

*Neuration* : forewings, cell one-half of wing ; discocellular vertical, very faint ; first median nervule at three-fourths, second at seven-eighths ; radials normal ; 7, 8, 9 stalked from a little before end ; 10 shortly before them, 11 at one-half ; 10 anastomosing with 11 and again with 7, 8, 9. Hindwings with 3, 4, and 6, 7 short-stalked.

Type : *C. pannaria* Guen. (*Acidalia*).

The underside of the hindwings in the ♂ is roughened and sometimes beset with long hair-like scales.

#### 79. *Calyplocome roseoliva* sp. nov.

*Forewings* : dull rosy, with sinuous olive-ochreous transverse bands ; the costa rosy, with a subcostal olive-ochreous stripe ; the bands are obscurely marked and difficult of exact observation ; antemedian, median, postmedian, and submarginal, with traces of yet another below apex ; fringe rosy and ochreous.

*Hindwings* : without first line ; both wings with dark linear cell-spot.

Underside of forewings glossy rosy ; of hindwings yellowish. Vertex, antennae, face, and palpi brown ; thorax and patagia olive-ochreous ; abdomen rosy.

Expanse of wings : 18 mm.

One ♂ from St. Vincent, March 1897 (Rendall).

80. *Cnemodes dentilinea* sp. nov.

*Forewings* : greyish flesh-colour, finely dusted with dark atoms ; the lines fuscous ; first vertical at one-fourth, curved below costa and indistinct ; second from two-thirds of costa to three-fifths of inner margin, slightly inbent below middle, and obscure at costa ; third at five-sixths, irregularly dentate and fine ; marginal line very fine, interrupted by pale spots at the ends of the veins ; cell-spot blackish, distinct.

*Hindwings* : like forewings, but without first line.

Underside paler, the ground-colour ochraceous tinged and suffused with rosy ; the two outer lines and the cell-spots indicated. Head, thorax, and abdomen like wings ; abdomen, face, and palpi whitish below ; fillet between antennae black.

Expanse of wings : 37 mm.

One ♀ from Paramba, Ecuador.

Distinguished from the other species of the genus by the submarginal line being denticulated instead of undulating.

81. *Craspedia approbata* sp. nov.

*Forewings* : pale ochreous with slight blackish dusting ; lines yellowish ochreous, parallel to hindmargin ; first from one-third of costa to one-fourth of inner margin, bent in cell ; median from beyond middle of costa to middle of inner margin, excurved round cell ; outer line very fine and denticulate at three-fourths ; submarginal line broad between two ochraceous shades ; a marginal row of small black dots ; fringe ochreous ; cell-spot round, black, and distinct ; the exterior line at costa is slightly marked with brownish.

*Hindwings* : without first line ; the hindmargin slightly prominent in middle.

Underside whitish ochreous, the forewings suffused with greyish ; cell-spot and outer lines indicated. Palpi ochreous, second joint externally dark fuscous ; face ochreous, with slight fuscous bar at top ; vertex white ; thorax and abdomen pale ochreous.

Expanse of wings : 17 mm.

One ♂ from Carupano, December 1891 (C. W. Ellacombe).

Distinguished especially by the pale face. It comes very close to *C. atomaria* Warr. from Jamaica, which also has the face ochreous, but the present species is much less speckled with dark scales ; the fringe is pure ochreous without the basal dots that occur in *atomaria*, and the hindmargins of wings are not crenulate.

82. *Craspedia chlorochrea* sp. nov.

*Forewings* : cream-white, thickly dusted with pale greenish ochreous ; the lines very indistinct ; the first at one-fourth, curved ; the outer at five-sixths, denticulate, parallel to hindmargin ; submarginal waved, pale ; a dark, greenish cell-spot ; costa narrowly ochreous ; a marginal row of dull greenish spots ; fringe concolorous ; a diffuse oblique median shade.

*Hindwings* : similar.

Underside paler, without dusting ; costa of forewings fuscous ; cell-spots, outer and marginal lines expressed. Face and palpi brown, collar ochraceous ; vertex and shoulders white ; thorax and abdomen like wings.

Expanse of wings : 26 mm.

One ♂, two ♀ ♀ from Castro, Parana, January 1895 (E. D. Jones)

In the ♂ the lines are hardly visible.

### 83. *Craspedia consobrinata* sp. nov.

*Forewings* : greyish ochreous, densely dusted with fine rufous and fuscous scales ; the lines as in *C. ambagifera*, Warr., but with slight differences ; first line at one-fourth, bent in cell, then vertical, *not outcurved* ; second line at two-thirds, obliquely concave to vein 6, then sinuous to beyond middle of inner margin, the angle at vein 4 very slight ; outer line at four-fifths, fine, formed of small lunules ; a slight blackish marginal line, interrupted at veins, fringe concolorous ; cell-spot white with brown edge ; the space between second and third lines, which in *ambagifera* is prominently pale, is here only slightly so, and very often, especially in the ♀ ♀, of the same tint as the rest of the wing.

*Hindwings* : similar ; the space before second line with slightly darker scaling, especially on each side of the cell-spot which is insignificant.

Underside less dusted, with the two outer lines distinct. Head, thorax, and abdomen concolorous with wings ; face and palpi brown, paler beneath.

Expanse of wings : 24 to 26 mm.

Three ♂♂, four ♀ ♀ from Ciudad Bolivar, Venezuela, June 1898 (Klages), and a pair from Caicara, Orinoco, 1898 (Cherrie).

The abdomen of the ♂ beneath has a double tuft of ochreous and blackish hairs on basal segment.

### 84. *Craspedia flexistrigata* sp. nov.

*Forewings* : dull ochreous suffused with brown ; the lines concise, dark brown ; first at one-third, sharply angled in cell, then oblique inwards, parallel to hindmargin ; second from costa beyond middle, acutely angled on vein 6, then flexuous and oblique inwards to before middle, approximating to first line ; third line at five-sixths, bluntly bent at vein 7, then flexuous parallel to hindmargin ; the second and third lines are each followed by a less distinct brown line and a deeper brown shade ; apex of the wing paler, limited below by an oblique line from apex to angle of second line ; an interrupted black marginal line ; fringe paler brown, with dark dots at base in the fringe beyond the pale dots at the ends of the veins, cell-spot black.

*Hindwings* : paler ; the cell-spot larger ; submarginal line waved, between brown shades.

Underside ochreous, with the markings brown. Head, thorax, and abdomen concolorous ; face brown ; abdomen with brown rings.

Expanse of wings : 19 mm.

Several of both sexes from Santos, Brazil.

The forewings are elongate, with oblique and slightly sinuous hindmargin ; hindwings short, with hindmargin toothed at vein 4 ; tarsi of the ♂ invisible.

### 85. *Craspedia rasa* sp. nov.

*Forewings* : very pale sulphur-yellow, slightly greenish-tinged ; without any distinct markings, but in certain lights two or three faint paler and darker lines can be seen running parallel to the hindmargin ; fringe concolorous.

*Hindwings* : like forewings.



Underside less yellow ; costa of forewings broadly reddish from base to apex. Head, thorax, and abdomen concolorous ; face and palpi above pale reddish.

Expanse of wings : 17 mm.

One ♂ from Ciudad Bolivar, Venezuela, November 1898 (S. Klages).

#### 86. *Craspedia rostrilinea* sp. nov.

*Forewings* : dull white, irrorated with fine ochreous and grey scales ; costa finely ochreous, more broadly in the apical half ; lines ochreous and grey, crenulate ; all parallel, except towards costa, to the rather oblique hindmargin ; the two outer lines, postmedian and submarginal, are recurved to costa, and the tooth on vein 6, at the angulation in each, projects beaklike outwards : cell-spot and linear marginal spots blackish ; fringe concolorous, dusted with dark scales, and with indications of an interrupted darker middle line.

*Hindwings* : similar, but without first line ; cell-spot beyond central line.

Underside glossy white, with the lines showing through ; forewings tinged with ochreous fuscous, becoming fuscous along the costa.

Face and palpi dark brown above, paler below ; vertex and antennae brown ; collar ochreous ; thorax and abdomen like wings.

Expanse of wings : 26 mm.

One ♂ from Popayan, Colombia (Lehmann).

Vein 7 of hindwings from well before angle of cell.

#### 87. *Craspedia unicornata* sp. nov.

*Forewings* : milk-white, thickly speckled with fine black atoms ; the lines ochreous ; costal edge ochreous ; antemedian line indistinct, sometimes marked with a few black scales on median vein ; median line sinuous and dentate ; outer line fine, denticulate, the teeth clearly marked with blackish points, that on vein 6 at the end of a larger tooth projecting prominently towards hindmargin, lying in the ochreous submarginal shade ; subterminal ochreous shade partially interrupted into blotches ; a series of blackish marginal triangles ; fringe whitish ochreous, thickly speckled with black atoms ; cell-spot black, distinct.

*Hindwings* : without first line ; the teeth of outer line hardly marked with darker.

Underside pale ochreous, unspeckled ; forewings washed with greyish ochreous ; all the markings distinctly reproduced. Face and palpi brown-black ; vertex and collar ochreous, like the costal edge of forewings ; thorax and abdomen white, speckled with black ; shoulders white, unspeckled.

Expanse of wings : 17 mm.

One ♂ from Santos, one ♀ from S. Paulo, Brazil.

#### 88. *Craspedia uniformata* sp. nov.

*Forewings* : dull greyish ochreous, slightly rufous-tinged and thickly covered with grey atoms ; the lines dark grey, but indistinct ; an antemedian at one-third, bent below costa ; a thick median line from beyond middle of costa to beyond middle of inner margin, much excurved round cell ; an outer line at five-sixths, regularly dentate-lunulate, somewhat incurved beyond cell and on submedian fold ; a marginal row of blackish dashes ; fringe concolorous, minutely speckled with grey ; cell-spot dark, indistinct.



*Hindwings* : similar ; no first line.

Underside ochreous ; the forewings suffused throughout with dull rosy ; the marginal dashes of both wings dark red. Face and palpi deep red ; vertex and antennae ochreous ; thorax and abdomen pinkish ochreous ; antennae with long ciliations.

Expanse of wings : 21 mm.

One ♂ from St. George's, Trinidad, November 1891 (C. W. Ellacombe).

#### 89. *Craspedia viridipunctata* sp. nov.

*Forewings* : pale stone-colour, thickly sprinkled with olive and pinkish scales ; the lines dentate, marked with olive-green points on the veins ; first at one-fourth, strongly angled in cell ; a median line also angled and touching the green discal-spot, followed by a diffuse olive-green shade ; exterior and submarginal lines approximated ; hindmargin festooned, with small greenish spots between the veins ; fringe concolorous.

*Hindwings* : similar, without first line ; the hindmargin conspicuously toothed at middle.

Underside paler, suffused with purplish grey ; the lines of the same colour ; head, thorax, and abdomen like wings ; face pale brown.

Expanse of wings : 32 mm.

One ♀ from Petropolis, Brazil.

#### *Crypsityla* gen. nov.

*Forewings* : with costa straight, curved before apex ; hindmargin obliquely curved.

*Hindwings* : with well rounded hindmargin.

Antennae of ♂ finely ciliated ; palpi shortly porrect ; hindlegs of ♂ aborted. Hindwings of ♂ with an oval thickening near base of submedian vein, bearing beneath a tuft of curled scales.

*Neuration* : forewings, cell two-fifths of wings ; discocellular vertical ; first median nervule at three-fourths, second at seven-eighths ; lower radial from above centre of discocellular ; upper normal ; 7, 8, 9 stalked ; 10 and 11 free, 11 rising far back towards base ; 10 anastomosing with 11 and again with 8, 9. Hindwings with vein 7 from before upper end of cell ; 3 and 4 stalked.

Type : *Crypsityla quinquelineata* Dogn. (*Acidalia*).

#### 90. *Dichromatopodia deflexa* sp. nov.

*Forewings* : dark chocolate-brown ; the lines ochreous ; first curved at one-third ; second from two-thirds of costa to two-thirds of inner margin, excurved beyond cell ; a pale angulated cell-mark ; marginal dark line with distinct pale spots on the veins ; fringe concolorous.

*Hindwings* : with the outer bent line only distinct.

Underside dull ochreous suffused with red ; the outer lines of both wings only marked. Head, thorax, and abdomen all concolorous.

Expanse of wings : 22 mm.

One ♂ from Palma Sola, Venezuela, 1896 (Whyman).

91. *Euacidalia germana* sp. nov. and ab. *obscura* nov.

*Forewings*: ochreous with a slight reddish tinge, minutely speckled in parts with blackish; first line at one-fourth, blackish, obscure, bent in cell, then oblique; median shade just beyond middle, bent round cell, diffuse, to middle of inner margin; outer line at five-sixths, minutely angled outwards on vein 6, then sinuate, parallel to hindmargin, marked by distinct black spots on veins; submarginal line obscure, between two darker greyish shades, the inner one with darker lunulate blotches between the veins; fringe pale ochreous with distinct blackish spots at base beyond the veins; cell-spot small, dark.

*Hindwings*: similar, without first line.

Underside the same, the forewings greyer; outer line and cell-spots distinct. Face and palpi dark brown; vertex, thorax, and abdomen concolorous with wings.

Expanse of wings: 19 to 22 mm.

Two ♂♂, 1 ♀ from Newcastle, Jamaica.

A second ♀ expands 26 mm. and is wholly smoky greyish fuscous, the markings more or less hidden; it may be distinguished as ab. *obscura*.

This darker form must be something like *E. sericcata* Pack., from N. America.

Both wings have the hindmargin indented opposite the cell, the hindwings slightly crenulate throughout.

92. *Euephyra subsimilis* sp. nov.

*Forewings*: whitish ochreous, thickly dusted with rufous-olive, more fuscous above costa; first line from before one-third of costa to one-fourth of inner margin; bluntly angled in cell, then oblique and sinuous inwards; outer line from three-fourths of costa to three-fourths of inner margin, oblique outwards to vein 6, then less oblique to vein 4, thence sinuous inwards; cell-spot oval, whitish, edged with brown, lying in a very slight and diffuse median shade; a fine dark marginal line interrupted at the veins; fringe concolorous.

*Hindwings*: the same.

Underside paler, less speckled; the first line not expressed. Head, thorax, and abdomen like wings; face and palpi browner, like the lines.

Expanse of wings: 21 mm.

One ♀ from Paramba, Ecuador, 3500 ft., May 1897, dry season (Rosenberg).

Like *conspicillaria* Snell. in shape and colour of wings, but the lines not denticulate; the discal white spot smaller.

93. *Haemalea circumducta* sp. nov.

*Forewings*: greyish ochreous, with a faint greenish tint, dusted and suffused with grey; the lines very indistinct; a waved inner line, diffuse median shade, and waved outer line are obscurely traceable; a row of smoky black marginal spots before the fringe, which is concolorous; cell-spot small and dark.

*Hindwings*: similar.

Underside paler, in the forewings suffused with rosy. Face and palpi reddish brown; thorax and abdomen like wings.

Expanse of wings: 22 mm.

One ♀ from Palma Sola, Venezuela.

94. *Haemalea minuta* sp. nov.

*Forewings* : bone-colour, very faintly dusted with darker ; the costa and fringe dark vinous ; marginal line dark purple-black, preceded by some purplish brown clouds ; three curved, slightly waved, very pale brown lines, at even distances apart ; the basal less curved than the two outer ; cell-spot minute.

*Hindwings* : similar, without the basal line ; the middle line before the small black cell-dot.

Underside white with the fringes vinous ; forewings, except along inner margin, washed with rosy. Face, palpi, and forelegs deep rosy ; thorax and abdomen like wings ; vertex and antennae fuscous.

Expanse of wings : 15 mm.

One ♂ from S. America, exact locality not stated.

95. *Haemalea penumbrata* sp. nov.

*Forewings* : pinkish ochreous, dusted with grey ; lines very obscure, slightly waved ; a median, exterior, and submarginal can be faintly traced ; cell-spot diffuse, dark ; a dull purplish marginal shade, obliquely edged from apex to beyond cell, then narrowed, and ending on submedian fold ; a deeper marginal line ; fringe pinkish ochreous.

*Hindwings* : the same, without any marginal shade.

Underside paler ochreous, pinkish tinged. Face and palpi red-brown ; thorax and abdomen like wings.

Expanse of wings : 22 mm.

One ♀ from Dominica, June 1897.

96. *Haemalea perlata* sp. nov.

*Forewings* : glossy, semi-hyaline white, very finely dusted with dark ; the costa bronzy brown-black ; marginal line of similar coloured lunules, separated by a white dot at the end of each vein ; the lines, represented by dark dots, indistinctly connected ; the first, near base, slightly curved ; the second at two-thirds, oblique and nearly straight ; the exterior, near hindmargin, sinuous ; submarginal line obscurely dentate ; cell-spot bronzy brown ; fringe white with slight bronzy reflection.

*Hindwings* : the same, without first line ; hindmargin slightly produced in middle.

Underside like upper, with the cell-spots, outer, and marginal lines brown ; costa of forewings likewise brown. Face, vertex, and front of thorax bronzy brown ; lower third of face white ; thorax and abdomen white.

Expanse of wings : 20 mm.

One ♀ from St. George's, October 1891 (C. W. Ellacombe).

Nearest to *H. ruficinctata* Guen. but smaller, much more transparent ; the fringes white, not red ; the middle line of forewings well beyond cell-spot, instead of over it.

97. *Haemalea straminea* sp. nov.

*Forewings*: bright straw-yellow, thickly flecked with orange; an orange spot at base; the lines dark brown; first at one-third, vertical, faintly bent outwards just below the median vein; second at two-thirds, oblique outwards to vein 4, bent inwards and subobsolete to vein 2, then parallel to the upper arm to inner margin shortly before anal angle; traces of an interrupted submarginal line; marginal line deep brown; fringe concolorous.

*Hindwings*: with outer line only, and that very faint and interrupted.

Underside paler, with the lines showing through; hindwings with an obscure broadish dark margin. Head, thorax, and abdomen like wings.

Expanse of wings: 19 mm.

One ♀ from Cachabí, Ecuador, low country, November 1896 (Rosenberg).

98. *Heterephyra distinctata* sp. nov.

*Forewings*: dull brick-red, finely dusted with fuscous; the lines fuscous; first from one-fifth of costa to one-fourth of inner margin, curved, and slightly projecting in cell and on submedian fold; second from two-thirds of costa to two-thirds of inner margin, slightly angled outwards at veins 6 and 4, then incurved; third at four-fifths, fine and distinct, somewhat irregularly dentate, oblique outwards to vein 6, incurved to vein 4, vertical to vein 3, then strongly oblique inwards to above vein 3, thence vertical to inner margin; a very faint cloudy submarginal shade; marginal line distinct, black, interrupted at the veins; fringe brick-red; cell-spot oval, whitish, with dark edge.

*Hindwings*: precisely similar.

Underside dull rosy with the inner margins whitish; the lines faint. Thorax and abdomen like wings; fillet and base of antennae white; rest of antennae, face, and palpi deep red.

Expanse of wings: ♂ 30 mm.; ♀ 32 mm.

One ♂ from Dominica, August 1895 (Elliott), type; one ♀, St. Vincent, March 1897 (Rendall).

The ♂ is darker, with more obscure markings.

99. *Heterephyra fuscicosta* sp. nov.

*Forewings*: dull brick-red, dusted with fine fuscous scales; the costa dark fuscous throughout; the lines diffuse and indistinct; first from one-third of costa to one-fourth of inner margin, vertical below the median; second at two-thirds, faintly dentate, strongly incurved below middle; third at five-sixths, sinuous, regularly and bluntly dentate, the teeth filled up with fuscous scales; marginal line reddish, indistinct; fringe whitish with reddish base; cell-spot round, white, black-edged.

*Hindwings*: similar, the lines very indistinct; the cell-spot round and black.

Underside pale pinkish. Thorax and abdomen like wings; vertex, antennae, face, and palpi, dull dark red.

Expanse of wings: 34 mm.

One ♀ from Cachabí, Ecuador, low country, January 1897 (Rosenberg).

Distinguished from *H. distinctata* by the dark costa, reddish vertex, and pale fringes.

100. *Heterephyra fuscidiscaria*.

*Forewings* : dull brownish testaceous, with a slight olive tint, darker, somewhat purplish, towards hindmargin ; the lines purplish, obscure ; first at one-fourth, vertical, bent below costa ; median shade bent slightly round the cell-spot, which is round and large, diffusely filled with purplish scales and with a purplish crescent on its inner edge ; outer line denticulate, at three-fourths ; a dark purplish marginal line ; fringe brownish.

*Hindwings* : similar ; the cell-blotch larger ; the ground-colour more rufous.

Underside gilded yellowish, or yellow flushed with red ; the lines and cell-spots and costa of forewings brick-red. Palpi yellowish, externally bright red ; face brown-red above, ochreous below ; vertex brown-red ; shoulders and patagia ochreous ; thorax and abdomen much tinged with red-brown.

Expanse of wings : 28 mm.

Several ♀♀ from Santos (type) and Petropolis, Brazil.

Near *H. perspectaria* Wlk., with which it agrees in the markings, but the cell-spots are wholly different.

101. *Heterephyra illimitata* sp. nov.

*Forewings* : dull brick-red, very finely dusted with grey, with three grey lunulate-dentate lines, as in *perspectaria* Wlk. ; the first, at one-third, vertical ; the second and third parallel to each other and incurved below middle ; marginal area darker ; fringe concolorous, without any trace whatever of marginal line or spots ; cell-spot round, varying in size, pure white with a dark grey edge and some blackish scales at centre.

*Hindwings* : the same, without first line ; cell-spot always larger than that of forewings.

Underside uniform dull flesh-colour, with a slight bronzy yellow tinge. Face and palpi above dark red-brown, pale-ochreous below ; vertex, antennae, thorax, and abdomen concolorous with wings.

Expanse of wings : 40 mm.

Two ♂♂ from Paramba, Ecuador.

Akin to *discopunctaria* H. S., and *perspectaria* Wlk. ; distinguished from the former by the total absence of marginal line or spots, and by the dark vertex ; from the latter by the large round white discal spots ; and from both by the much larger size.

*Hyriogona* gen. nov.

♂ *Forewings* : elongate, with curved costa ; apex produced ; hindmargin oblique, long, hardly curved ; inner margin heavily fringed.

*Hindwings* : narrow, more or less elongated ; inner margin generally long, and the anal angle produced, the hindmargin well rounded.

Antennae of ♂ lamellate, shortly pubescent, the joints minutely angled and spiked ; palpi short, hairy beneath ; tongue and frenulum present ; hindtibiae thickened and tufted, without spurs ; the tarsi quite short.

*Neuration* : forewings, cell more than half as long as wing ; first median at three-fourths, second shortly before end of cell ; radials normal ; veins 7, 8, 9, 10



stalked, 11 free ; submedian fold strongly sinuous ; hindwings with 6 and 7 long-stalked ; vein 3 from before end of cell ; vein 2 at one-half, strongly curved downwards at origin and recurved again towards 3 at hindmargin ; inner margin thickened, with a long fringe and tuft of hair ; the submedian vein also fringed with hair beneath.

Type : *Hyriogona capitata*, sp. nov.

102. *Hyriogona capitata* sp. nov.

*Forewings* : lemon-yellow, the basal two-thirds wholly suffused with pinkish lilac, dusted with grey ; first line darker lilac at one-third, angled in cell, then oblique to inner margin before middle ; outer line from costa at two-thirds to anal angle, irregular above middle, with a sinus inwards beyond cell, and a beak outwards between veins 3 and 4, vertical below ; apical area with two pale lilac clouds from costa to vein 4 ; veins with a dark lilac dot at their ends ; fringe lemon-yellow with no trace of basal line ; cell-spot large, dark.

*Hindwings* : lilac, leaving only a narrow yellow margin, widest at costa and vanishing before anal angle ; exterior line of forewings reproduced, with some yellow imbricate patches in the angles ; fringe yellow ; cell-mark lilac.

Underside duller. Head, thorax, and abdomen concolorous with the lilac of the wings.

Expanse of wings : 17 mm.

One ♂ from S. Paulo, Brazil.

103. *Hyriogona fimbriata* sp. nov.

Resembles *H. capitata*, but in the forewings there is a long tooth of scales from the anal angle ; the hindwings are shorter, the hindmargin more rounded ; vein 2 of hindwings is straight, not curved ; and there is a fringe of long hairs on upper side along cell and vein 5 to margin.

*Forewings* : greyish pink, with no first line ; the edge of the yellow triangular space at margin is oblique into anal angle, instead of reaching the inner margin before it ; apical region filled up with dull pink.

Expanse of wings : 16 mm.

One ♂ from Chimbo, Ecuador, August 1897, 1000 ft. (Rosenberg), type ; and three ♂ from Paramba, Ecuador, June 1897, dry season, 3500 ft. (Rosenberg).

*Neochrysa*, gen. nov.

♂ *Forewings* : elongate ; costa slightly curved ; apex produced ; hindmargin curved, more obliquely below the middle.

*Hindwings* : lanceolate, the inner margin very short, fringed and tufted with long hairs ; hindmargin produced in middle to a blunt point.

Antennae of ♂ ciliated ; palpi quite short, smooth ; tongue and frenulum present ; hindtibiae without spurs, but with a pencil of hairs.

*Neuration* : forewings, cell half the length of wing ; first median nervule at four-fifths ; second close before end of cell ; radials normal ; 7, 8, 9 stalked ; 10 and 11 stalked, 10 anastomosing with 7, 8, 9, forming a single areole ; hindwings with 6 and 7 short-stalked, 6 running into the point ; vein 3 from well before 4 ; vein 2 from much nearer the base.

Type : *Neochrysa comosa* sp. nov.

104. *Neochrysa comosa* sp. nov.

*Forewings* : deep yellow ; the costa and lines purple-rosy ; the first line at one-third, and the median, which is incurved below middle, both diffuse, the area from base to median more or less wholly suffused with purple-rosy ; outer line waved, from three-fourths of costa to anal angle ; marginal area beyond it suffused with purple-rosy, containing an obscure pale submarginal line ; fringe yellow.

*Hindwings* : with a straight median rosy shade, the basal area within it suffused with rosy ; the rest as in forewings.

Underside similar to upper. Thorax, vertex, and face deep purple-red ; fillet, antennae, and abdomen yellow ; the last red-spotted.

Expanse of wings : 12 mm.

One ♂ from Sao Paulo, Brazil.

*Neosterrha*, gen. nov.

*Forewings* : with costa straight, convex before apex, which is bluntly subfalcate ; hindmargin oblique, faintly sinuous.

*Hindwings* : kite-shaped ; apical and anal angles squared ; hindmargin angled at vein 4.

Antennae of ♂ subserrate, with very long fascicles of cilia ; palpi short, thick, not reaching front of face ; second joint rough-scaled, third minute ; tongue and frenulum present ; hindtibiae and tarsi in ♂ of equal length, not aborted, the tibiae with terminal spurs only.

*Neuration of Craspedia* ; in colour and markings recalling *Mnesithetis*.

Type : *N. thetis* sp. nov.

105. *Neosterrha thetis* sp. nov.

*Forewings* : dull olive-green with three darker green lines ; first curved at one-fourth ; second oblique and excurved round cell, from two-thirds of costa to beyond middle of inner margin ; third submarginal, more strongly denticulate ; marginal line darker green, interrupted by pale spots at the vein-ends ; fringe green varied with paler ; cell-spot black, distinct ; traces of a median dark shade visible on the costa.

*Hindwings* : with two lines ; cell-spot a double white dot.

Underside paler ; costa of forewings tinged with rufous ; marginal line dark green. Face and palpi reddish ; vertex, thorax, and abdomen green, like the wings.

Expanse of wings : 19—26 mm.

Three ♀ ♀ from Azalar de Carthago, Costa Rica, 5-6000 ft. (Underwood), type ; one ♀ from Chimbo, August 1897 (Rosenberg) ; one ♂ from Paramba, Ecuador, and one ♂ from R. Dagua, Colombia (Rosenberg).

Sometimes the whole of the forewings beneath, and the marginal and outer lines of hindwings are deep rosy.

*Pogonogya* gen. nov.

*Forewings* : triangular ; costa straight, convex before apex, which is produced, especially in the ♂ ; hindmargin oblique, slightly prominent at vein 3.

*Hindwings* : with hindmargin rounded and slightly prominent in the middle, more strongly in the ♂ ; inner margin in the ♂ thickened and furrowed, the furrows beneath and the marginal edge with expansible tuft of long hairs.

Antennae filiform, in ♂ pubescent ; palpi quite short ; hind legs of ♂ aborted, of ♀ long, the tibiae with a pair of very short apical spurs ; abdomen of ♂ long, with the anal segments well developed.

*Neuration* : forewings, cell about half as long as wing ; first median nervule at two-thirds, second at eight-ninths ; radials normal ; 7, 8, 9, 10 stalked from before end of cell ; 11 from one-half, bent down towards but not anastomosing with the stalk of the others : hindwings, in the ♂, with 6, 7 and 3, 4 long-stalked ; in the ♀ 3, 4 hardly stalked ; 6 and 7 coincident throughout.

Type : *Pogonogya rufulata* sp. nov.

The coincidence of veins 6 and 7 in the hindwings of the ♀ is curious ; I have seen only this one ♀ ; and further examination may prove it to be merely an accidental peculiarity, but I do not expect so ; the two ♂♂ have identical neuration throughout.

#### 106. *Pogonogya rufulata* sp. nov.

*Forewings* : reddish ochreous, dusted with reddish, especially along the hind-margin beyond the outer line ; costa narrowly red ; cell-spot indistinct, reddish ; only the outer line distinct, from five-sixths of costa to inner margin just before anal angle, above which it is curved outwards ; fringe red. In one ♂ there are traces on the inner margin of an inner and a median line. In the ♀ the marginal area is not more tinged with red than the rest of wing.

*Hindwings* : with the fringe and a short line close to the apex red ; the rest of the wing in the ♀ like forewing ; in the ♂ wholly suffused with red, and with a sinuous postmedian red line ; the furrow above and the hairs of inner margin deep red ; the hairs in the furrow beneath pale ochreous.

Underside paler, tinged with red towards the hindmargin ; thorax and abdomen like wings ; head, collar, palpi, and antennae all red.

Expanse of wings : 17 mm.

Two ♂♂, one ♀ from Ciudad Bolivar, Venezuela, May and June 1898 (Klages).

#### 107. *Polygraphodes denticulata* sp. nov.

*Forewings* : whitish, finely grey-speckled ; the lines blackish, rising from black costal spots ; first line at one-fourth, bent in cell, then oblique and fine ; median line thick, dentate-lunulate, strongly outcurved round the black cell-spot to beyond middle of inner margin ; outer line fine, black, from two-thirds of costa to three-fourths of inner margin, marked with black points on veins and forming an acute prominent angle outwards on vein 6, followed by a dark lunulate shade (reduced to a line beyond cell and on submedian fold), which forms the inner edge of the very obscure submarginal line ; marginal spots deep black ; fringe white, chequered with grey between the veins, and with a grey spot in the middle of each whitish interval.

*Hindwings* : similar, without first line.

Underside dull whitish, with the markings grey and very indistinct. Face and palpi above brown, whitish below ; vertex and antennae white ; thorax and abdomen whitish, with grey dusting.

Expanse of wings : ♂ 18 to 22 mm ; ♀ 24 to 26 mm.

A good series from Parana, Entre Rios, Argentina.

**Prasinochrysa** gen. nov.

*Forewings* : with costa straight for two-thirds, then convex ; apex rectangular ; hindmargin curved.

*Hindwings* : with apex rounded ; hindmargin curved, somewhat indented before anal angle, which is square and prominent.

Antennae of ♂ subdentate, ciliated ; palpi porrected upwards, slender, smoothly scaled ; tongue and frenulum present ; hindtibiae thickened and flattened, covered with a tuft of hair, hindtarsi very short and aborted.

*Neuration* : forewings, cell half the length of wing ; discocellular vertical ; first median nervule at three-fourths, second shortly before third ; lower radial from above the centre of discocellular, upper from top end of cell ; 7, 8, 9 stalked ; 10 from the same point, anastomosing with 11 high up and again shortly afterwards with 7, 8, 9 ; 7 rising from the end of areole ; the second areole very small ; hindwings with the two subcostals from end of cell ; medians and radial as in forewings.

Type : *P. eueharis* Drury (= *Chrysauge detracta* Wlk.).

It seems impossible to locate this species in any of the existing genera of *Sterrhinae*.

**Prospasta** gen. nov.

A development of *Ptychopoda* Stph., on the lines of *A. amplipennis* Butl. from India.

♂ *Forewings* ; with the inner margin very short, not more than half as long as the costal margin ; the hindmargin almost equalling the costal in length, distinctly sinuous, bulging outwards between veins 2 and 4, the anal angle appearing lobed and projecting over the hindwing.

*Hindwings* : of ordinary shape, the apex rounded, the anal angle squared ; a long pencil of hairs from the base lying along the fold within the inner margin. Hindtibiae thickened and flattened, without spurs ; tarsi quite short.

Antennae ciliated ; mouth parts damaged.

Type : *Prospasta elata* sp. nov.

108. **Prospasta elata** sp. nov.

*Forewings* : pale ochreous, the markings chestnut-brown ; a spot at base of cell ; one on costa at one-third, representing first line, which is slightly curved outwards and runs to the middle of inner margin ; a small cell-spot ; a sinuous double outer line from two-thirds of costa to inner margin close before the anal angle, where it is most distinctly marked ; fringe apparently concolorous with ground-colour.

*Hindwings* : with a broad central chestnut fascia, commencing narrow before middle of costa, but on inner margin extending from anal angle to one-third from base ; the area beyond it dusted with brown.

Underside wholly ochreous ; the pencil of hairs along inner margin of hindwings brownish. Head, thorax, and abdomen ochreous ; middle segments of abdomen brown.

Expanse of wings : 17 mm.

One ♂ from Paramba, Ecuador.



109. *Ptychopoda atriseriata* sp. nov.

*Forewings* : bone-colour, sparsely dusted with black atoms ; the lines marked with greyish ochreous scales ; first at one-third, curved, often indistinct, marked also by three black vein-dots ; median shade broad, parallel to hindmargin, situate at two-thirds ; outer line at five-sixths, slightly waved, and marked by a very distinct series of black vein-dots ; submarginal line pale, traversing a somewhat darker marginal area ; fringe ochreous, with small black spots at the base, on the fringe at the vein ends, not on the hindmargin ; cell-spot black and distinct.

*Hindwings* : similar, but without first line ; median shade embracing the black cell-dot ; marginal shades darker grey than on forewings. In both wings the space between median shade and exterior line is paler and undusted.

Underside very similar, with the outer markings distinct.

Face and palpi brown-black ; vertex whitish ; thorax and abdomen ochreous.

Expanse of wings : ♂ 16 mm. ; ♀ 18 mm.

Two ♂♂ from Onoribo, February—March 1893 ; another from the interior of Surinam, August 1892, and three ♂♂ from Paramaribo, December 1892 (C. W. Ellacombe).

110. *Ptychopoda flexicosta* sp. nov.

*Forewings* : greyish ochreous, dusted and suffused with darker ochreous, or with dark grey ; in the latter case the lines and markings are more distinct ; these are all parallel more or less to one another and to the hindmargin ; first from two-fifths of costa to one-fourth of inner margin ; median shade from two-thirds of costa to middle of inner margin ; outer line irregularly dentate-lunulate, from five-sixths of costa to three-fourths of inner margin, followed by a narrow pale space ; submarginal line pale and waved between two narrow waved darker bands ; a slight row of marginal dark spots ; fringe concolorous, dusted and lined with grey ; cell-spot dark, distinct.

*Hindwings* : similar, without first line.

Underside coarsely dusted with fuscous atoms ; cell-spots and outer lines distinct ; the marginal spots larger and plainer, at the ends of the veins as well as between them. Head, thorax, and abdomen like wings. Antennae thick, subserrate, with bristly cilia.

Expanse of wings : 17 mm.

Five ♂♂ from Parana, Entre Rios, Argentina, two of the darker form, the other three more ochreous ; the description is made from the darker specimens, as the markings are apt to become lost in the paler ones. The costa of forewings is convex near base and before apex, inflected between ; in perfect specimens the wings present a mealy appearance.

In the forewings the cell is more than half as long as the wing ; the discocellular short, the subcostal and median veins being both bent inwards towards extremity ; the lower radial rises from above the centre, the upper radial is somewhat curved upwards at origin ; veins 7, 8, 9 stalked ; 10 anastomosing with 11 and again with 8, 9. In the hindwings 6, 7 are on a long stalk. Superficially the insect much resembles some species of the Pyralid genus *Metasia*.



111. *Ptychopoda gibbosa* sp. nov.

*Forewings*: pale brownish ochreous, sprinkled with dark scales; the lines obscure, slightly darker than the ground-colour; first line hardly traceable; median thick, subdentate, very oblique below middle, from two-thirds of costa to middle of inner margin; outer line at five-sixths, denticulate, the teeth indicated by black dots on veins; a pale submarginal band between two darker bands; fringe concolorous, with small black dots in it beyond the veins; cell-spot small.

*Hindwings*: similar.

Underside silky, brownish ochreous, with cell-spots and outer line distinct. Face, palpi, and forelegs brown-black; collar ferruginous; thorax and abdomen like wings; vertex paler ochreous.

Expanse of wings: ♂ 18 mm.; ♀ 21 mm.

One ♂, one ♀ from St. Andrew's, Grenada, April 1890.

The markings in the ♂ are less distinct than in the ♀. In both sexes the hindmargin of hindwings is slightly indented beyond cell; but whereas the shape of the hindwing in the ♀ is normal, and the anal angle well marked, the hindwing in the ♂ is short and nearly round, both angles being rounded off; the abdomen (♂) is unusually elongated, with spreading anal tuft; the antennae of ♂ with short ciliations; in both sexes veins 6, 7, of hindwings are on a short stalk. In the ♀ the middle spurs of the hind-tibiae are almost obsolete.

112. *Ptychopoda indecora* sp. nov.

*Forewings*: dingy ochreous grey, speckled with fuscous; the lines marked by rather large blackish spots; first at one-third, the spots generally obsolete; median shade from quite two-thirds of costa to middle of inner margin, slightly rufous-tinged and thicker below; cell-spot blackish, variable in size and distinctness; outer line at five-sixths, the spot on vein 6 displaced towards hindmargin; fringe concolorous, with a row of dark dots at base beyond veins.

*Hindwings*: similar, with a paler submarginal line indicated, between two submarginal darker shades.

Underside much paler and clearer, without dingy dusting; cell-spots and outer line very distinct. Head, thorax, and abdomen concolorous; tips and outside of palpi blackish.

Expanse of wings: 23 mm.

Two ♂♂, four ♀♀ from Dominica, March (4), June (1), and November (1) 1897.

The ♂♂ are paler than the ♀♀, and in consequence the markings more clearly traceable.

113. *Ptychopoda infantula* sp. nov.

*Forewings*: bone-colour, tinged with ochreous; first line blackish, at one-fourth, angled below the subcostal, then oblique; a similar line, blacker on costa, just beyond middle; traces of a submarginal line; cell-spot large and black at two-thirds; fringe concolorous.

*Hindwings*: with a blackish antemedian line, a large black cell-spot, and traces of a submarginal line.

Underside much suffused with dull ochreous and grey; both cell-spots very large, black. Face and palpi black-brown; vertex, thorax, and abdomen concolorous with wings; abdomen with traces of a black band in middle.

Expanse of wings : 11 mm.

One ♀ from the island of Bonaire, July 1892 (E. Hartert).

Forewings narrow, elongate; costa straight; apex produced; hindmargin oblique. Hindwings with inner margin short.

#### 114. *Ptychopoda* (?) *longipedata* sp. nov.

*Forewings* : dull greyish ochreous, thickly sprinkled with dark-grey scales; the costa dark grey at base; lines parallel to hindmargin, which is very oblique; first line indistinct; median from two-thirds of costa to beyond middle of inner margin, touching the black cell-spot; outer line from four-fifths of costa, below which it is faintly curved, to inner margin before anal angle, denticulate, marked with black vein-dashes; submarginal line very indistinct; fringe grey, with a row of black dots in it beyond the veins.

*Hindwings* : the same.

Underside darker, the lines and spots more distinct. Head, thorax, and abdomen like wings; face and palpi brown-black.

Expanse of wings : 26 mm.

One ♂ from Parana, Entre Rios, Argentina.

The fore and middle legs are very long and slender; the hind-femora are also long, the hindtibiae and tarsi are wholly hidden in a tuft of greyish ochreous hairs. The forewings are elongate, with the apex produced and the hindmargin oblique.

#### 115. *Ptychopoda* *oedipus* sp. nov.

*Forewings* : pale olive-ochreous, the veins rather paler; traces of an inner line at one-third, marked by black scales; at two-thirds a curved slightly sinuous fascia of black scales, becoming thickened below the middle, edged by a paler line; submarginal line faintly paler.

*Hindwings* : similar.

Underside ochreous, speckled with deeper ochreous. Face and palpi dark brown; thorax and abdomen like wings.

Expanse of wings : 11 mm.

One ♂ from Cachabí, low country, November 1896 (Rosenberg).

The hindtibiae of the ♂ are swollen into a flat pad or ension.

The species somewhat resembles *Pt. monogrammata* Guen. in miniature.

#### 116. *Ptychopoda* *pedissequa* sp. nov.

*Forewings* : chalk-white, thickly powdered with greyish ochreous; the lines of the same colour; antemedian curved, at one-third; an oblique cloudy postmedian shade from two-thirds of costa to middle of inner margin; exterior line at five-sixths, subdentate; a submarginal line; a marginal line of dark dashes; fringe concolorous; cell-spot grey.

*Hindwings* : with the three outer lines curved.

Underside washed with grey; the marginal dashes distinct; head, thorax, and abdomen like wings; face above dark brown.

Expanse of wings : 12 mm.

Three ♀♀ from Bonaire, July 1892 (E. Hartert), type; and three ♀♀ from Ciudad Bolivar, Venezuela, May to August 1898 (Klages).

117. *Ptychopoda substrigata* sp. nov.

*Forewings*: chalk-white, sparingly dusted with greyish ochreous scales; the lines grey; first curved at one-third, second at five-sixths, dentate-lunulate; the dusting thicker in the central area towards the lines; a small black cell-spot; a greyish ochreous band before hindmargin, separated from the outer line by a white band without darker dusting; marginal dots small, dark; fringe white, dusted with grey.

*Hindwings*: whiter, less dusted; outer line browner; cell-spot and marginal dots as in forewings.

Underside white, slightly dusted; both wings with a broad diffuse straight brownish submarginal band; cell-spots and marginal spots distinct. Head, thorax, and abdomen white.

Expanse of wings: 16 mm.

One ♀ from Parana, Entre Rios, Argentina.

118. *Rhodostrophia obscura* sp. nov.

*Forewings*: pale grey, thickly covered with dark-grey scales; no first line visible; a very indistinct darker median shade, parallel to hindmargin, passing just beyond a cloudy dark cell-spot; outer line fine, blackish, from four-fifths of costa to three-fourths of inner margin, irregularly waved and obscurely subcrenulate, edged by a slightly paler space, beyond which the marginal area is darker grey; marginal spots linear, blackish; fringe grey.

*Hindwings*: paler grey, with traces only of two submarginal lines above anal angle.

Underside pale glossy grey, with outer line of forewings darker. Head, thorax, and abdomen pale grey, speckled with darker; vertex, top of face, and base of antennae whitish; face and palpi dark brown.

Expanse of wings: 28 mm.

One ♂ from Chili.

Of the same size and shape as *R. chilendaria* Blanch. (*Acidalia*), but more sombre in colour.

*Tricentra* gen. nov.

*Forewings*: with costa shouldered at base and curved just before apex which is slightly produced; hindmargin decidedly bent at vein 3.

*Hindwings*: with hindmargin irregular, bent at vein 6 and again at vein 3, subcrenulate; the anal angle strongly marked.

Antennae of ♂ thick, ciliated; palpi short, porrect; hindlegs of ♂ not aborted, the tibiae with three spurs.

*Neuration*: forewings, cell about one-half: discocellular vertical; first median at two-thirds, second at seven-eighths; radials normal; 7, 8, 9 stalked; 10 anastomosing with 11 and again with 8, 9; hindwings with 6 and 7 from upper end of cell.

Type: *Tricentra flavimarginata* sp. nov.

119. *Tricentra flavimarginata* sp. nov.

*Forewings* : deep vinous red, dusted with darker ; blackish along basal half of costal area and along hindmargin ; a blackish line at one-fourth of costa to one-fourth of inner margin, angulated outwards in cell ; a blackish crenulated line outcurved from two-thirds of costa to submedian fold, then vertical to inner margin at three-fourths ; a subdentate blackish submarginal line parallel to the last ; hindmargin with the fringe bright yellow, except at extreme apex and at the bend at vein 3, where the blackish scales extend across the fringe ; two small white cell-dots on the discocellular.

*Hindwings* : similar, but the yellow margin hardly interrupted, the edge of the dark marginal area irregularly crenulate ; cell-dots as in forewings.

Underside paler and duller ; a pale streak on discocellular. Thorax and abdomen dull vinous red ; shoulders blackish ; head damaged, but apparently black ; antennae red.

Expanse of wings : 19 mm.

One ♂ from Paramba, Ecuador, Jan. to May 1897.

Superficially somewhat recalling a *Chrysocraspeda*.

*Xenostigma* gen. nov.

Like *Anisodes* in shape and markings of wings, but the palpi more like those of *Heterophya* ; second joint long, squamous, obliquely porrect in front of face, third joint minute, hardly visible ; antennae of ♂ subserrate, with regular cilia ; hind-tibiae and tarsi of ♂ aborted, a long pencil of hair from the femoro-tibial joint.

*Neuration* : forewings, cell about half as long as wing ; discocellular somewhat inangulated ; first median nervule at four-fifths, second at seven-eighths ; radials normal ; 7, 8, 9 stalked from well before end of cell, 10 a little before them, 11 from one-half ; 10 anastomosing with 11, and again with 8, 9, forming a double areole. Hindwings with veins 3 and 7 close before angles of cell.

Type : *X. perfusaria* Wlk. (*Ephyra*?).

120. *Xenostigma perfusaria*.

*Ephyra*? *perfusaria* Wlk. xxii., p. 634.

Walker's type is without head, and otherwise not in perfect condition. I have therefore thought it useful to redescribe the species shortly from a fresh ♂, from Ciudad Bolivar, Venezuela, May 1898 (Klages).

*Forewings* : pale wood-colour, dusted with darker, and suffused towards hindmargin with rufous ; first line at one-fourth, much outcurved, indicated by three blackish dots on subcostal, median, and submedian veins respectively ; second line from just beyond middle of costa to beyond middle of inner margin, also strongly outcurved, parallel to first line, lunulate outwards ; third line at three-fourths, marked by distinct black vein-spots, which represent the teeth of the denticulations ; submarginal line very obscure, preceded by a dark cloud on costa, three confluent blackish blotches between veins 4 and 7, and another at anal angle ; an oblique blackish triangular streak from apex to the subcostal blotches ; marginal lunules distinct, black, with slightly paler edging ; fringe concolorous, with black dots beyond the veins ; cell-spot small, whitish, edged with rufous.

*Hindwings* : cell-spot large, oval, black-brown, with a few pale scales at centre,



lying between straight antemedian and median parallel dark lines ; the rest as in forewings.

Underside paler, less dusted, with dark cell-spots and outer dotted line in both wings, the forewings with a straight dusky median shade. Face and palpi externally blackish ; vertex, thorax, and abdomen like wings ; abdomen with the segmental divisions dark.

Expanse of wings : 26 mm.

Walker's type was a ♀ from Venezuela.

#### SUBFAMILY TEPHROCLYSTIINAE.

##### *Phaulostathma* gen. nov.

*Forewings* : triangular ; costa nearly straight, faintly incurved at middle ; hindmargin long, obliquely curved.

*Hindwings* : very small ; costa and hindmargin curved ; all the margins fringed.

Palpi long, porrect, thickly haired, terminal joint indistinct ; forehead produced below ; antennae of ♂ strongly ciliated.

Neuration as in *Tephroclystia*.

Type : *Phaulostathma disformata* Dogn. (*Eupithecia*).

##### *Stenopla* gen. nov.

♂ *Forewings* : elongate-triangular ; costa straight ; apex prominent ; hindmargin oblique, curved towards anal angle.

*Hindwings* : narrow, almond-shaped ; apex prominent ; inner margin short and densely fringed ; hindmargin curved from the somewhat pointed apex.

Palpi rostriform, porrect, twice as long as head ; antennae broken ; abdomen elongated, with anal tuft strongly developed ; hind tibiae with four spurs.

*Neuration* : forewings, cell three-fifths of wing ; discocellular straight, oblique ; first median at four-fifths, second close before third ; radials normal ; areole simple ; 7, 8, 9 stalked ; 10, 11 stalked, 10 anastomosing with 8, 9 ; hindwings with lower arm of discocellular very oblique, reaching to three-fourths of wing, 8 anastomosing with 7 for three-fourths of cell ; 6, 7 stalked ; medians as in forewing, all three very short.

Type : *Stenopla virescens* sp. nov.

##### 121. *Stenopla virescens* sp. nov.

*Forewings* : olive-green ; the lines black, sharply angled below costa ; first close to base ; second and third, forming the edges of the central fascia, at one-third and two-thirds ; the space between basal patch and fascia, and the interior itself of fascia, dusted with fine black scales, and with fine but obscure parallel transverse lines ; a darker band with wavy edge beyond second line, touching the oblique black cell-spot ; submarginal line obscure, preceded by dark patches at costa, beyond cell, and above anal angle ; fringe olive-green.

*Hindwings* : greenish grey, with traces of two darker central lines and a cell-spot.

Underside of both wings greenish ochreous ; the lines indistinct and dull. Head, thorax, and abdomen green ; anal segment with a dark spot.

Expanse of wings : 26 mm.

One ♂ from Santos, Brazil.



122. *Tephroclystia dentosa* sp. nov.

*Forewings*: dull dark greenish, covered with dense iron-grey suffusion and crossed by numerous strongly dentated blackish lines, finely edged with paler scales; a blackish submarginal band between the outer and submarginal lines, interrupted above by a paler oblique space from the apex; a small pale spot on margin at anal angle; marginal line black and thick, interrupted by pale spots at the vein ends; fringe pale greenish chequered with dark grey.

*Hindwings*: similar; the inner marginal half of wing paler.

Underside paler, more yellowish, with all the markings blackish and distinct. Head, thorax, and abdomen yellowish green, mottled with blackish.

Expanse of wings: 25 mm.

One ♀ from Paramba, Ecuador.

The palpi are long and porrect, with the terminal joint short. In the single specimen the thorax and base of forewings are ochreous yellow, but this colour is almost certainly due to the effects of moisture.

123. *Tephroclystia fumimixta* sp. nov.

*Forewings*: dull olive-green, suffused, except towards hindmargin, with smoky olive-fuscous, which almost obliterates the markings; submarginal line pale, lunulate, the lunules partially filled up with darker; marginal line obscurely dark, interrupted by a small pale dot at the ends of the veins; fringe concolorous.

*Hindwings*: with traces of several transverse slightly waved darker lines, one postmedian being broader than the rest and more conspicuous.

Underside dull greenish cinereous, with traces of darker shades, which are most distinct at costa of forewings. Head, thorax, and abdomen olive-green, mixed with fuscous.

Expanse of wings: 24 mm.

One ♀ from Azalar de Carthago, Costa Rica, 5000 to 6000 ft. (Underwood).

124. *Tephroclystia praelongata* sp. nov.

*Forewings*: pale ashy grey, dusted with darker; the lines very faint and fine; the inner at one-third, the median, the exterior at two-thirds, and the submarginal, all bent in beyond the cell and then parallel to hindmargin; cell-spot and marginal spots black, distinct; fringe pale grey.

*Hindwings*: more whitish in the costal half; speckled with grey along inner margin, where there are traces of the commencement of four dark lines.

Underside of forewings grey, of hindwings whitish, without markings. Head, thorax, and abdomen grey.

Expanse of wings: 18 mm.

One ♀ from Chili.

Forewings very narrow; hindmargin very oblique, as long as inner margin; hindwings elongate, almond-shaped.

125. *Tephroclystia purpureoviridis* sp. nov.

*Forewings*: pale green; the markings dark purplish; a fine curved dark line close to base; a broad curved central fascia formed of four slightly crenulate diffuse purplish lines separated by whitish green scales, the band nearest base considerably

obliterated by the green ground-colour; a submarginal line of small purple lunules most distinct beneath costa, beyond cell and towards inner margin; fringe rufous-purplish.

*Hindwings*: whitish in basal half, green beyond; two straight antemedian dark lines; a broad purplish median band, partially double; a submarginal row of small purple spots, with whitish edges.

Underside dull purplish mixed with green; the bands deeper purplish. Head, thorax, and abdomen green; the palpi porrect, long.

Expanse of wings: 20 mm.

One ♀ from Paramba, Ecuador, Jan. to May 1897.

#### SUBFAMILY TRICHOPTERYGINAE.

##### 126. *Rhopalista albidivisa* sp. nov.

*Forewings*: ochreous, suffused in parts with flesh-colour, olive-green, and rufous; basal patch small, edged by an olive-green band with dark margins; central fascia with inner band narrow, olive-green, traversed by three black lines, the outer band waved and sinuous, projecting in middle towards hindmargin, traversed by four blackish lines; central space white from costa to inner margin, containing an obscure dark cell-spot; submarginal line lunulate, pale, traversing a mixed rufous and greenish shade, preceded and followed beyond cell by blackish blotches; marginal line black, interrupted; fringe pinkish ochreous, chequered with olive-green beyond the veins.

*Hindwings*: whitish, with some greyish scales near base; abdominal tuft whitish, surrounded by a bed of rufous scales; fringe white.

Underside ochreous whitish; the edges of the central fascia indicated on costal half; a blackish apical blotch traversed by the pale submarginal line and stopping short at vein 4; a smaller marginal blotch between veins 2 and 3; hindwings with grey curved submarginal shade; cell-spots blackish. Head, thorax, and abdomen ochreous varied with olive-green and rufous scales.

Expanse of wings: 30 mm.

One ♂ from Merida, Venezuela, 1600 m., 1898 (Briceño).

##### 127. *Rhopalista requisitata* sp. nov.

*Forewings*: dull olive-green, crossed by irregular dentate-lunulate darker green lines, which along costa and on the veins in places deepen into black; two basal, and three extra-basal, sharply angled outwards on veins and folds, lunulate between; filled up with deeper green, so as to form two bands, with a paler green space between and at base; central fascia with the inner edge formed of three, and the outer of four dark lines, also deepened into bands by darker green between them, the outer four running in below middle and coalescing with the inner three, so that the width of the central fascia on inner margin is only one-third of its costal breadth; space between basal patch and central fascia and centre of fascia itself above the median pale green; cell-spot linear, black, distinct; central fascia followed by three obscurely lunulate olive-green lines; submarginal line dentate, pale green, indicated mainly by dark-green wedge-shaped blotches marked with black before and after, these being most distinct at costa and beyond cell; two black marginal spots at end of each vein, and a black spot beyond each in the pale-green fringe.

*Hindwings* : dingy greyish white, with some pale rufous-grey hairs in the cell ; the flock of hair on the submedian fold silky white.

Underside dull dirty white, discoloured with grey ; the forewings with inner margin, an obscure angulated outer fascia, and the apex paler ; hindwings with traces of three curved interrupted postmedian fasciae ; the tuft of hair on submedian fold below ochreous grey. Head, thorax, and abdomen olive-green ; the thorax deeper green, mottled with blackish scales ; the abdomen paler, with the hinder edges of segments marked by a double row of dorsal black spots ; the front edge of the last three segments with a smaller black spot in the centre.

Expanse of wings : 48 mm.

Two ♂♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

The forewings are very much like *H. frondosata* Guen.

## 128. *Rhopalista rosenbergi* sp. nov.

*Forewings* : greyish ochreous, strongly suffused with dull greenish ; the markings brownish fuscous ; these are a basal patch, crossed by two or three dark lines and edged by an irregularly dentate outer line ; a more or less vertical band before the middle, irregularly edged on both sides, containing three or four dark waved lines, forming the inner margin of the usual central fascia ; its outer margin wider, excurved beyond cell and somewhat greyer and obsolescent below middle ; submarginal line obscure, lunulate, preceded by dark patches on costa, and beyond cell, these being separated by an oblique pale streak from apex ; the paler spaces before and beyond central fascia each traversed by two waved and dentate lines ; fringe greenish, with a pair of black spots at base at the end of each vein ; cell-spot linear, blackish, placed in the paler centre of the central fascia.

*Hindwings* : sombre grey ; the fringe ochreous with dark spots beyond veins ; marginal spots as in forewings ; tuft of hair on submedian fold large, ochreous ; the inner margin darker.

Underside dingy straw-colour, mottled with fuscous ; forewings with inner margin broadly whitish ; space between median and fourth median nervule above and submedian fold below dull fuscous ; a black apical blotch, leaving apex itself and a narrow spot on middle of hindmargin straw-colour ; cell-spot black, followed by three obscure dark lines below costa ; hindwings with cell-spot, postmedian line, and marginal fascia blackish ; tuft of hair on submedian fold fuscous. Face, palpi, and vertex rather bright ochreous, mixed with fuscous scales ; thorax dark brownish olive ; abdomen ochreous, varied with rufous and fuscous scales.

Expanse of wings : 35 mm.

One ♂ from Chimbo, Ecuador, August 1897, 1000 ft. (Rosenberg).

This species, named after the collector, is near *R. gazapina* Dogn., from Loja, but that has yellowish hindwings.

## 129. *Rhopalista undulosa* sp. nov.

*Forewings* : pale greyish green, crossed by bands formed of fine black waved and crenulated lines ; basal band consisting of three such lines, the outermost twice curved outwards ; inner edge of central fascia a band of three lines ; outer edge also of three, but the outermost of these three bent outwards away from the other two, marked with dark vein-dashes, and separated from the others by a fine greenish

line ; submarginal line irregularly waved, pale, preceded by three black interrupted waved lines, of which the outermost is thickest and fills up some of the lunules with black ; pairs of black dots on hindmargin at the ends of the veins ; fringe green, chequered with dark beyond veins ; cell-spot small, blackish ; the fascia between basal patch and central fascia is traversed by a central blackish and two greenish lines, most distinct on costa.

*Hindwings* : whitish, with pale grey narrow submarginal band and faint marginal dots in pairs ; fringe whitish ; abdominal area greyish-tinged ; the tuft of hairs ochreous.

Underside dirty whitish in forewing ; traces of the three outer lines of central fascia ; cell-spot blackish, linear ; costa dotted with black ; a blackish apical blotch, not quite reaching the apex itself, through which the submarginal line is marked by four pale spots ; hindwings clearer white, with dark cell-spot, dotted postmedian line, and distinct submarginal band ; fringes of both wings whitish, with interrupted blackish marginal line at base. Face, palpi, thorax, and abdomen pale green ; abdomen dotted with black and with a black basal band beyond metathorax ; vertex paler.

Expanse of wings : 40 mm.

One ♂ from Castro, Parana, September 1898 (E. D. Jones).

The green both of wings and body is very apt to fade into ochreous.

### 130. *Rhopalodes seminivea* sp. nov.

*Forewings* : silky whitish grey, with a faint olive-green tinge ; the basal patch and central fascia filled up with olive-green and grey mixed in places with rufous ; basal patch with the inner two-thirds olive-green, crossed by three or four black curved lines, the outer third paler, separated from the inner part by a curved pale line ; curved band between basal patch and central fascia whitish green, traversed by two darker lines ; central fascia with three dark lines on its inner edge and four on its outer ; the central area generally paler, and partially annular ; on the costa the fascia is green, becoming rufous in the cell, and below, the veins above inner margin marked with dark scales ; its outer edge is angled below subcostal vein and again at vein 4, concave between ; the pale band following it contains two or three confusedly denticulate green lines ; submarginal line white, interrupted, preceded by irregular dark rufous and fuscous blotches ; marginal area green, with a pale diffuse oblique apical streak ; pairs of black dashes on margin at the ends of the veins with submarginal dashes between them, these last often connected with the dark outer edging of the lunules of the submarginal line ; fringe olive-green mottled with darker beyond the veins.

*Hindwings* : pure satiny white above and below.

Underside of forewings glossy, whitish towards inner margin, smeared with dark grey towards costa ; external lines of central fascia, and the submarginal fascia on the costa bright red, as are the subapical veins, between which the white submarginal line is preceded by a blackish cloud. Head and thorax mottled light and dark green ; face paler ; abdomen ochreous grey.

Expanse of wings : 35 mm.

Two ♂♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

Smaller and much more delicate than *R. patrata* Snell.



131. *Rhopalodes variegata* sp. nov.

*Forewings* : whitish ; the transverse lines olive-green, slightly dusted in parts with pale brick-red scales ; basal patch pale brick-red, narrow ; central fascia suffused with scales of the same colour, sometimes from costa to inner margin, sometimes chiefly on costal half ; the inner and outer edge of central fascia and the cell-spot blackish ; all the lines much as in *R. patrata* Snell.

*Hindwings* : dull whitish, with a slight rusty tinge.

Underside of both wings pale, without markings ; forewings with a sordid pink tinge ; the costa with black marks at the beginning of the cross lines ; no dark postmedian and marginal grey bands. Head, thorax, and abdomen pale ochreous, tinged with pale reddish ; anal segment of abdomen with a distinct blackish spot, basal segment obscurely darker ; no dark dots on the two first segments ; palpi black externally.

Expanse of wings : 36 mm.

Five ♂♂ from Castro, Parana (E. D. Jones).

## SUBFAMILY EUCESTIINAE.

132. *Lissopsis dukinfieldi* sp. nov.

*Forewings* : uniform fulvous orange ; the fringe grey ; a pale oblique streak from apex showing through from beneath ; costa at base tinged with grey.

*Hindwings* : the same, with the streaks below faintly showing.

Underside of forewings like upperside, but the costa narrowly and apical area broadly olive-brown, the latter with an oblique cream-white streak from apex to vein 5 ; fringe brown ; hindwings brown with cream-white, yellow-edged streaks and blotches ; an elongated blotch on costa from base, its lower edge curved, a tooth-shaped mark beyond middle of costa, and a fine curved line to apex ; a streak from near base of cell, where it is swollen, running into hindmargin, throwing off an arm at two-thirds to anal angle ; and a streak from base along submedian fold ; fringe brown, except along the costal apical white curve, where it also is white.

Head, thorax, and abdomen dull mouse-colour ; face with white cheeks ; basal joint of antennae, legs, and pectus interspersed with whitish scales.

Expanse of wings : 37 mm.

One ♂ from Castro, Parana, March 1898 (E. Dnkinfield Jones).

## SUBFAMILY HYDRIOMENINAE.

Genus BREPHOSCOTOSIA Warr., Nov. Zool. II. p. 114.

In the description of the neuration of this genus, made without denuding the wings, an error occurs. In the forewings, vein 11 rises well before the middle of cell below the costal shoulder, 10 from before end of cell ; 10 anastomoses, as usual, with 11 and again with 8, 9 ; 7, 8, 9 are stalked from end of cell ; first median at two-thirds, second at eleven-twelfths. In the hindwings the first median rises at three-fourths, second at seven-eighths ; 6, 7 are short-stalked ; and the costal anastomoses with subcostal to near end of cell.



133. *Calocalpe rosenbergi* sp. nov.

♂ *Forewings*: dark grey, with the usual series of curved darker lines and slightly paler interspaces forming alternate lighter and darker dashes on the veins; basal patch and central fascia a little darker; submarginal line waved, pale, forming a more prominently whitish blotch above the submedian fold; fringe concolorous; marginal line dark.

*Hindwings*: with no distinct markings except the pale submarginal line.

Underside brownish grey, with the veins spotted; cell-spot and marginal lines of central fascia towards costa dark. Head, thorax, and abdomen concolorous.

♀ with the space between basal patch and central fascia and the whole marginal area paler grey, the basal patch and the central fascia itself, especially the marginal bands, by contrast, much darker grey; submarginal line not so white, but edged externally with darker blotches; the hindwings with the curved postmedian line and basal area darker. Underside pale grey, with basal two-thirds in both wings deeper; cell-spots in both wings black.

Expanse of wings: ♂ 52 mm.; ♀ 54 mm.

A pair from Ibarra, Ecuador, May 1897 (Rosenberg).

Named after the collector.

The species is considerably larger than either of Butler's Chilean species, *cauquenensis* and *exacta*, with which it is most nearly allied.

The ♂ shows slight traces of a vinous tint at the rise of veins 3 and 4.

134. *Camptogramma* (?) *foedata* sp. nov.

*Forewings*: dull dark grey, the lines and markings darker; the whole basal two-thirds suffused with darker rendering the lines indistinct; first line curved at one-fifth; inner edge of central fascia curved parallel to it; outer edge at two-thirds, darker and more distinct, being followed by a whitish line, incurved beyond cell, then forming two blunt projecting teeth between veins 2 and 4; submarginal line dentate, indicated by small wedge-shaped whitish-tipped black marks, connected by blackish dashes with the hindmargin; the whole wing crossed by indistinct dark waved lines; cell-spot black; submarginal line obscure; fringe grey.

*Hindwings*: similar; hindmargin slightly incurved beyond cell.

Underside pale cinereous, with the markings darker. Head, thorax, and abdomen dull grey.

Expanse of wings: 36 mm.

One ♀ from Paramba, Ecuador, January to May 1897.

This may be a *Scotocoremia*.

*Deinoptila* gen. nov.

♂ *Forewings*: broad; the costa abruptly shouldered at one-fourth, then straight, only slightly curved before apex, which is acute; hindmargin obliquely curved; inner margin decidedly convex.

*Hindwings*: ample; costa curved; apical angle produced, obtusely rounded; hindmargin nearly straight, and faintly crenulate; inner margin with a very dense erect fringe of hairs; all the veins below the median clothed with layers of hair; the cell filled with mealy scales.

Forewings on underside with a bed of hair along inner margin, and the retinaculum with a large curled tuft.

Antennae filiform; palpi rostriform; hind-tibiae with four spurs.

*Neuration*: forewings, cell less than half of wing; discocellular oblique; first median nervule at about two-thirds, second just before third; radials normal; the upper slightly stalked with 7, 8, 9; 10 and 11 stalked, 10 anastomosing with 8, 9. Hindwings with discocellular angulated, the radial from below the centre.

Type: *Deinoptilu penicula* Dogn. (*Ciduria*).

### **Dolichopyge** gen. nov.

*Forewings*: elongate; costa nearly straight; apex rounded; hindmargin very obliquely curved.

*Hindwings*: narrow; apex produced; hindmargin rounded; inner margin short. Palpi porrect, drooping, hairy beneath. Antennae of ♂ thick, lamellate, slightly pubescent, of ♀ filiform. Abdomen of ♂ elongate, the anal tuft much enlarged. Inner margin of hindwings in ♂ attenuated, but with no trace of a lobe.

*Neuration*: forewings, cell longer than half of wing; discocellular vertical; first median nervule at three-fourths, second close before end; the median nervure shortly upcurved at extremity, so that the third median nervule seems to rise from the discocellular; areole simple; 10 and 11 being stalked, 10 anastomosing with 8, 9. Hindwings with discocellular oblique; the radial from its centre.

Type: *D. bifasciata* sp. nov.

### 135. **Dolichopyge bifasciata** sp. nov.

*Forewings*: pale grey, tinged in many instances with rufous or brown; basal patch of the pale ground-colour, marked only by the beginning of two dark lines on the costa; central fascia with its inner edge black, curved from nearly one-third of costa to one-fourth of inner margin, followed by a darker grey band with waved outer edge; outer edge of central fascia from two-thirds of costa to three-fourths of inner margin, black, crenulate, outcurved between veins 6 and 2, preceded by a darker band which is often obsolete below the median; a waved dark line shortly beyond it; submarginal pale, lunulate, the lunules filled in with dark grey at costa, beyond cell, and on submedian fold; that between veins 6 and 7 generally remaining pale; marginal line fine; fringe grey.

*Hindwings*: of ♀ grey, with traces of six or seven darker curved waved lines; of ♂ whitish, with the lines hardly visible.

Underside shining grey, with all the lines dark grey. Head, thorax, and abdomen pale grey, the abdomen dark grey along dorsum and with a dark ring on second segment; anal tuft in ♂ pale ochreous.

Expanse of wings: ♂ 26 mm.; ♀ 28 mm.

Many examples from Castro, Parana (E. D. Jones).

The central fascia is sometimes filled up with dark grey: at others the two external dark bands are almost obsolete.

### 136. **Epirrhoë corrivulata** sp. nov.

*Forewings*: fuscous grey, the lines and shades dark fuscous, the central fascia blackish fuscous; its inner edge curved and waved, at nearly one-third, blackish, its outer edge at two-thirds, oblique outwards to below vein 6, there bluntly angled and obliquely waved inwards; the fascia paler in the middle and traversed by two or three darker lines; basal area traversed by four fuscous lines, all parallel to inner

edge of fascia ; central fascia followed by three parallel waved lines, the outermost of which is developed into irregular dark fuscous triangles edged by the slightly paler submarginal line: pairs of marginal black dashes at the vein ends, separated by a pale dot in each interval ; fringe concolorous with wings.

*Hindwings*: dull greyish fuscous, without markings, except an obscure dark cell-spot, and a faint curved line and fascia just beyond middle: marginal spots as in forewings.

Underside greyish ochreous powdered with grey ; a central curved dark line on each wing and traces of submarginal shade. Head, thorax, and abdomen greyish fuscous.

Expanse of wings: 30 mm.

One ♀ from Parana, Entre Rios, Argentina.

A sombre-looking insect, distinguished by the single angulation of the central fascia externally at vein 6, and the central dark line beneath.

### 137. *Epirrhoë imbecillata* sp. nov.

*Forewings*: white, slightly dusted with grey, and crossed by numerous dark-grey waved lines ; these are all darker and more strongly expressed in the costal half of wing ; central fascia with the inner edge curved and waved ; the outer edge oblique from costa and forming a prominent subacute tooth between veins 3 and 4, thence incurved and lunulate ; the outer upper half of the fascia filled with dark grey ; a slight grey fascia near base ; the space between it and central fascia traversed by three indistinct grey waved lines ; central fascia edged outwardly by a broadish white band, traversed by a grey line and edged by a dark line which beneath costa is thickened and dentate, followed by another dark line ; submarginal line distinct, white, regularly dentate-lunulate, edged on both sides in the upper half of wing with blackish ; marginal area grey ; pairs of subcontiguous black marginal spots ; fringe white, chequered with grey beyond veins, and darker in basal half below costa : cell-spot blackish.

*Hindwings*: white, slightly dusted with grey ; cell-spot and marginal spots towards anal angle, dark grey ; fringe white ; traces of a grey submarginal line on inner border. In one specimen the cell and space beyond in the forewings is tinged with rufous.

Underside white ; basal area tinged with grey as far as outer line, which in the upper half of forewings is preceded by a dark grey cloud ; apex and hindmargin of forewings blackish ; hindwings with a grey marginal border ; cell-spots dark grey ; fringe of forewings white chequered with grey, of hindwings wholly whitish. Head, thorax, and abdomen white dusted with grey ; palpi dark grey.

Expanse of wings: 32 mm.

Two ♂♂ from R. Tanampaya, Bolivia (Garlepp) 1894.

### 138. *Epirrhoë multivagata*.

(?) *Scotosia multivagata* Hulst. *Bull. Brooklyn Ent. Soc.* iv., p. 27.

A ♂ example from Quincy, which appears, by comparison with the description, to belong certainly to *multivagata* Hulst., is an *Epirrhoë* and not a *Scotosia* ; the discocellular of hindwings is straight and oblique, with the radial from its centre ; the palpi are short and blunt, and the antennae ligulate, lamellate. In appearance it certainly is wonderfully like a grey *Scotosia*.

139. *Epirrhoë rufilineata* sp. nov.

*Forewings* : greyish ochreous, slightly tinged with green; the markings brown-black; basal patch small with a vertical brown-black edge, the extreme base remaining of the ground colour; central fascia occupying middle third of wing, its edges crenulate, the inner slightly curved, the outer nearly vertical, brown-black enclosing a small pale space at costa; the pale bands preceding and following it with a rufous line close to the fascia, and both as well as the central fascia itself tinged with rufous towards inner margin; submarginal line interrupted, the lunules followed by small wedge-shaped blackish marks, and preceded by a black-brown costal blotch, by two dark elongate marks beyond cell, and by a double sinuous cloud at anal angle; marginal line fine, black; fringe concolorous with ground colour, mottled with dark beyond veins.

*Hindwings*: dingy greyish ochreous, with traces of two curved postmedian lines.

Underside paler with central and submarginal dark grey fasciae on forewings, the latter broad at costa; hindwings with two curved postmedian bands. Face and palpi brown-black: vertex, thorax, and abdomen like wings.

Expanse of wings: 35 mm.

One ♂ between Chimborazo and Chimbo, July 1897 (Rosenberg).

140. *Epirrhoë subpulchrata* sp. nov.

*Forewings*: dull olive-green; basal patch small, edged by a band of three blackish irregularly waved lines; central fascia with its inner band formed of four, its outer of three waved and dentate blackish lines; the inner edge waved parallel to basal patch; the outer minutely dentate below costa, insinuate beyond cell, forming two prominent teeth between veins 4 and 2, and two others less prominent above inner margin; submarginal line pale, regularly lunulate outwards and dentate inwards, preceded by three similarly formed darker green lines; marginal line dark, interrupted at vein ends; cell-spot dark; fringe green, with deeper green chequerings beyond veins.

*Hindwings*: ochreous white, tinged with grey in basal half and along inner margin, with indications of two dark grey lines above anal angle; cell-spot grey; marginal line as in forewings; fringe ochreous white, chequered with grey.

Underside greenish ochreous, with blackish postmedian and marginal fasciae, the latter interrupted by a pale green spot below middle and paler at the apex; cell-spot large, blackish; hindwings yellower, with curved grey median, postmedian, and submarginal lines, the space between the first two rather greyer; cell-spot dark grey. Face, palpi, and thorax greenish; abdomen cinereous; metathoracic tuft and edges of abdominal segments dark.

Expanse of wings: 36 mm.

Two ♂♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

The palpi are short, and upturned.

*Eriopygidia* gen. nov.

Agreeing with *Spargania* Guen. both in general appearance and structure, but characterised at once by the difference in the abdomen of the ♂. This in *Spargania* is short and blunt; in *Eriopygidia* on the other hand it is elongate, reaching



considerably beyond the hindwings; the anal parts are largely developed, and surrounded with long curled tufts of hair.

Type *E. augustaria* H. S. (*Eucosmia*).

#### 141. *Eriopygidia olivata* sp. nov.

*Forewings*: olive-green, varied with olive-brown; the lines velvety black; the first close to base, the second at one-fourth; two median near together and enclosing a somewhat darker narrow central fascia with a black cell-streak touching the inner line; an exterior line at three-fourths, distinct only on costa; submarginal line pale grey, regularly waved, preceded and followed by black waved and partially lunulate lines; pairs of black spots at the ends of the veins, followed by black blotches in the olive-green fringe.

*Hindwings*: dark smoky brown, becoming deeper along hindmargin; fringe rufous.

Underside dull rufous, in the forewings tinged with olive towards base; the lines dull black, continuous; forewings with a broad blackish marginal fascia; hindwings with two lines. Face, vertex, and thorax pale olive-green; palpi and abdomen also olive-green, spotted with black; anal tuft in the ♂ olive-ochreous, strongly developed.

Expanse of wings: 32 mm.

One ♂ from Newcastle, Jamaica.

Distinguished from *Amygdalopteryx dulciferata* Wlk., and *Xanthorhoe perviridis* Warr., to both of which it bears a superficial resemblance, by the smoky brown hindwings.

#### 142. *Eriopygidia semirubra* sp. nov.

*Forewings*: bright olive-green, the lines black or blackish green, separated by deep blue-green tints and edged with pale silvery blue; the lines forming about eleven velvety black spots on costa; base deep blue-green with a broad black dentate-edged basal line finely margined with bluish white, succeeded first by a deep green line, then a black one finely edged with silvery blue and again with deep green, this last line being vertical at one-third; central fascia with the inner edge lunulate, two lunules being above and three below the median vein; each lunule deep green towards base and black externally with a silvery blue finer line between; outer edge of central fascia formed of three dentate black lines separated by deep blue-green; the outer of the three finely edged first with silvery blue and then with green; submarginal line lunulate, silvery white, interrupted, preceded and followed by deep-green shades which become black on each side below costa, and externally only beyond cell, the lunules above and below vein 3 united with hindmargin by conical black blotches; a pale yellowish green oblique streak from apex, and the centre of the bands preceding and following the central fascia also pale yellowish green; marginal line velvety black, interrupted by snow-white spots at the vein ends, those above the median with a black projection inwards, those below each interrupted between the veins; fringe deep green, the basal half darker; cell-spot large, velvety black.

*Hindwings*: dark smoky fuscous, the apical third orange; fringe smoky grey, mixed with orange scales in the upper half, the ends of the veins white; cell-spot dark.



Underside of forewings with basal half smoky grey, apical region and costa throughout deep fulvous, towards apex striated with black ; the costa with a pale spot at two-thirds and at apex ; cell-spot large, velvety black ; fringe as above ; hindwings with basal two-thirds grey speckled with darker ; outer third fulvous speckled with grey, with traces of two curved dark lines ; cell-spot black. Face and palpi dull olive-green ; thorax deep green and black ; abdomen cinereous olive, with whitish scales intermixed ; forelegs and base of costa of forewings reddish ; anal tufts largely developed, blackish, fulvous beneath.

Expanse of wings : 44 mm.

One ♂ from Chaco, Bolivia (Garlepp).

In certain lights the black tints of the forewings assume a purplish tint.

### **Euperizoma** gen. nov.

Distinguished from *Perizoma* Hüb. by the antennae of the ♂ being pectinated.

The areole of forewing is double, but vein 11 rises far back and does not diverge so much as usual from the subcostal nervure, the areole being therefore long and narrow, vein 10 only shortly anastomosing with 11 ; the cell is more than half as long as wing ; in the hindwings the discocellular is angled and the radial from below the centre. Scaling rather thin.

Type : *Euperizoma nubicincta* sp. nov.

#### 143. *Euperizoma nubicincta* sp. nov.

*Forewings* : pale grey, with darker grey lines and with a slight rufous or ochreous tinge ; basal patch obscurely darker ; central fascia formed of three diffuse grey lines, all parallel and slightly bent in cell ; marginal area dark grey, of about the same width as the central fascia, containing an indistinct waved submarginal line ; fringe grey with paler base ; marginal line formed of blackish dots in pairs on each side of the ends of the veins ; the spaces on each side of central fascia form two pale bands of uniform width ; cell-spot hardly visible.

*Hindwings* : similar ; the central fascia not so well marked.

Underside darker. Head, thorax, and abdomen all grey.

Expanse of wings : 26 mm.

One ♂ from Costa Rica.

#### 144. *Hammaptera* (?) *caliginosa* sp. nov.

*Forewings* : blackish grey, faintly green-tinged ; basal patch separated from central fascia by an oblique ochreous whitish band, broader on inner margin, with a dark line down the middle, which also is broader on inner margin ; central fascia broad, blackish, the wavy lines across it obscure ; its outer edge from two-thirds of costa to three-fourths of inner margin, with a rounded prominence at vein 6 and two more prominently projecting teeth between 2 and 4 ; followed by a pale ochreous band with a fine ochreous central line ; marginal area dark grey, containing two darker grey crenulated lines immediately following the pale band ; the submarginal line pale, lunulate, interrupted beyond cell by a cloudy blackish patch reaching hindmargin ; the lunule above vein 6 is filled with hoary grey scales, that between veins 3 and 4 is prominently whiter ; fringe blackish grey ; marginal line obscure.

*Hindwings* : pale sordid grey, paler towards costa ; marginal area darker beyond a paler lunulate submarginal line ; inner margin darker grey.

Underside of forewings blackish ; a small ochreous whitish apical blotch ; upper arm of pale band beyond central fascia swollen into a broad pale blotch ; inner margin and lower half of hindmargin paler ; hindwing dull ochreous, with five or six curved dentate innulate grey lines ; a curved grey submarginal band preceded by a slightly paler band. Face, thorax, and abdomen dark grey ; vertex, collar, and shoulders mixed with pale ochreous scales.

Expanse of wings : 40 mm.

One ♀ between Chimborazo and Chimbo, July 1897 (Rosenberg).

145. *Hammaptera tenera* sp. nov. and ab. *griselda* nov.

*Forewings* : cream-white, shaded in parts with pale pinkish and olive tints ; central fascia formed of two olive black-edged bands, separate above median vein and embracing an oblique dark linear cell-mark, uniting below median and forming often four flattened annuli, the outer edge of fascia sometimes marked with dark dashes on veins ; basal space pale, crossed by two pairs of wavy lines ; the band preceding and following the central fascia pale, traversed by a central wavy olive-ochreous line ; submarginal line whitish, regularly wavy, preceded and followed by an olive band, marked with black scales in the spaces beyond the cell and below vein 2, the darker markings in the outer band assuming the form of wedge-shaped streaks towards hindmargin ; marginal spots large, in pairs at the ends of the veins ; fringe pale, chequered with darker at the veins.

*Hindwings* : cream-coloured ; marginal spots as in forewings, preceded by a narrow pale grey border ; fringe wholly pale.

Underside cream-colour, suffused with pale olive-grey except along inner margin of forewings ; marginal border dull blackish, broad in forewings, narrow in hindwings ; in the former the apex and a small marginal spot below vein 4, as well as a narrow band preceding the fascia are pale cream-colour ; cell-spots distinct. Head, thorax, and abdomen cream-coloured tinged with olive and pinkish.

Expanse of wings : 26 to 30 mm.

One ♂, two ♀♀ from Parana (type), Entre Rios, Argentina ; also one ♀ from Caparo, Port of Spain, Trinidad, December 1896 (Dr. Rendall), and one ♀ from Venezuela (Mocquerys) ; a ♂ from Jamaica does not seem to differ.

The pencil of hairs in the abdominal fold of hindwings of ♂ is pale like the ground colour.

The insect is delicate in colour and soon bleaches, very few specimens appearing fresh.

The ♀♀ can be distinguished from pale ♀♀ of *E. fringillata* Guen., which they somewhat resemble, by the darker border of the forewings beneath reaching to vein 2 instead of stopping short at vein 4.

In a ♂ from San Pedro Sula, Honduras (bought from Herr Fruhstorfer) the ground colour is whitish overlaid with grey, without any pink, and with very slight olive tints visible. At first sight it appears very different from the type form, and may be distinguished as ab. *griselda*.

146. *Hydriomena praelatata* sp. nov.

*Forewings* : pale olive-green, with darker green, more or less confluent, striae ; the base and transverse fasciae purple-brown ; the latter with deeper wavy edges, and all darker and forming blotches on the costa ; the first three bent on the median vein ; first near base, interrupted at middle ; second broad, from one-fourth of costa

to before middle of inner margin ; third narrow from before middle of costa to beyond middle of inner margin ; fourth from two-thirds of costa to before anal angle, narrowed and wavy below middle ; fifth bifid at costa, and touching fourth at inner margin ; marginal line interrupted between the veins and with a black dash on them ; fringe greenish chequered with brown.

*Hindwings* : pale grey ; the marginal line and mottlings of fringe darker grey.

Underside of forewings cinereous, with the fasciae darker, along the costa blackish, leaving five pale green costal patches between them, the fourth the largest ; a pale green space along hindmargin from vein 3 to 7 ; hindwings cinereous, with two curved darker postmedian bands. Face green with two purple lateral streaks from the upper part ; palpi purplish ; vertex, thorax, and abdomen green ; abdomen flecked with darker scales, the anal tuft paler ; metathoracic tuft purplish metallic ; legs dark fuscous, mottled with green at the joints.

Expanse of wings : 35 mm.

One ♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

Smaller than *praemundata*, and more chequered in the markings ; the under-surface different.

#### 147. *Hydriomena praemundata* sp. nov.

*Forewings* : dull olive-green, without any darker green mottlings ; the base and five waved and dentate-edged fasciae purplish ; the first three bent on the median vein, the last two more dentate ; the last edged with whitish internally ; marginal line formed of dark blotches at the ends of the veins, followed by dark mottlings in the green fringes.

*Hindwings* : uniform dark grey, deeper towards hindmargin.

Underside cinereous ; the fasciae blackish along costa only, with three yellowish green intervals before apex, the middle one becoming white between veins 6 and 8 ; hindwings with traces of two curved darker lines beyond middle. Palpi fuscous ; face green, with two dark spots in the middle ; vertex and thorax green ; patagia with two black dots at base ; abdomen greenish cinereous, marked with darker along the back ; metathoracic tuft purple.

Expanse of wings : 39 mm.

One ♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

#### 148. *Ochyria inamorata* sp. nov.

*Forewings* : dull pinkish grey, varied in parts with white scales, and with the markings bright olive-green ; the basal patch, the inner and outer bands that limit the central fascia, and the marginal area are all olive-green, tinged in parts with yellowish ; the band between basal area and central fascia and the space beyond the fascia are dull pinkish grey ; the central area of the central fascia above the median, and more or less the whole width of it below, and the space beyond it towards anal angle are frosted with whitish scales, and all the green bands are finely edged with whitish ; cell-spot triangular, olive-green, edged with rufous ; submarginal line ill-defined, edged internally in places with reddish olive patches, and followed by a triple black blotch along margin between veins 4 and 7 ; a row of black marginal lunules ; fringe rufous grey, paler towards apices. All the lines become blackish along the costal edge.

*Hindwings* : dull yellowish white ; fringe the same ; traces of three or four

dark lines on inner margin above anal angle ; a dark marginal line along lower half of wing.

Underside cream colour ; forewings grey-tinged toward costa ; outer edge and lines of central fascia blackish ; apex and hindmargin blackish, the apex itself and a dull patch below vein 4 cream-colour ; fringe dark grey above middle, cream-coloured below ; hindwings with cell-spot and curved submarginal line grey, with faint traces of other lines along costa. Head, thorax, and shoulders olive-green ; the palpi externally darker green ; patagia and abdomen blackish, with a few whitish and olive-green scales intermixed ; abdomen on sides and underneath cream-colour dusted with grey.

Expanse of wings : 39 mm.

One ♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

The antennae of the ♂ subserrate and well ciliated ; palpi well developed.

#### 149. *Perizoma muscosata* sp. nov.

*Forewings* : greenish yellow, much speckled with dark fuscous and partially suffused with fuscous along the middle of disc and towards hindmargin, the veins remaining finely yellowish ; the lines fine, blackish, lunulate-dentate, more regular beyond the middle ; two close to base nearly vertical and straight, followed by a third, waved and dentate, forming the edge of the basal patch ; inner edge of central fascia formed by two blackish dentate lines, at about one-third ; outer edge by two partially double regularly dentate lunulate lines from two-thirds of costa oblique outwards to vein 6, then inwards to inner margin near middle, approaching the inner edge on submedian fold ; bands preceding and following central fascia traversed by a strongly waved line ; submarginal line black, regularly lunulate-dentate, with traces of a paler dark-edged line beyond it ; pairs of black marginal spots at the vein ends ; fringe dark grey ; cell-spot linear, blackish. The darker suffusion of the central area does not reach beyond the subcostal and submedian veins.

*Hindwings* : brownish grey, with traces of two curved submarginal lines, more distinct on inner margin ; cell-spot dark ; marginal spots as in forewings ; fringe brown-grey.

Underside ochreous frosted with brownish ; the forewings suffused with grey. Head, thorax, and abdomen like forewings ; face darker.

Expanse of wings : 23 mm.

One ♀ from Parana, Entre Rios, Argentina.

#### Genus *Plectroboarmia* Butler, Tr. E. S. 1882. p. 366.

This genus must be referred to the *Hydriomeninae* ; the costal vein of the hindwings anastomoses with the subcostal for nearly the whole length of the cell ; the discocellular is oblique ; the venation of the forewing is quite normal, the areole being double. The forehead is large and tumid ; and the palpi are upcurved in front of face.

#### 150. *Plemyriopsis olivacea* sp. nov.

*Forewings* : olivaceous, the costa with double dark marks at the commencement of the lines ; the lines all double with a paler centre ; first at one-sixth, oblique ; second at one-fourth, oblique and slightly undulating, forming inner edge of central fascia ; both these lines are angled just beneath costa ; a blackish oblique



cell-spot near beyond second line ; outer line at five-sixths, parallel to hindmargin, yellowish white finely edged on both sides with black and again with a pale black-edged line ; outer half of central fascia with several darker olive waved lines ; submarginal line formed of white-edged dark lunules ; fringe concolorous.

*Hindwings* : similar, the spaces between the dark lines paler.

Underside cinereous olive, with a rufous tinge along the disc of forewings; the hindwings paler. Head, thorax, and abdomen olivaceous cinereous.

Expanse of wings : 24 mm.

One ♀ from Azalar de Carthago, Costa Rica, 5000 to 6000 ft. (Underwood).

The hindmargin of both wings is simply bulged, not angled, below the middle.

#### 151. *Polyphasia truncata rufibrunnea* subsp. nov.

This South American form is distinguished by the fasciae before and after the central area being reddish brown, this tint also extending to the basal area, and in one of the two examples being also diffused over the whole wing, of which in the other example the central area is whitish; all the shades are more precise above the subcostal and below the submedian vein.

*Hindwings* : shining whitish grey.

Two ♀ ♀ from Parana, Entre Rios, Argentina, of 32 mm. expanse.

#### 152. *Psaliodes infantula*, sp. nov.

*Forewings* : dull lilac, crossed by three pale green lines ; the first at one-fourth, its outer edge concave ; second shortly beyond first ; third from two-thirds of costa to three-fourths of inner margin, sinuous, and indented below median ; joined above the middle by an oblique green streak from the apex.

*Hindwings* : pale grey.

Underside darker, and freckled ; the markings of the forewings showing through ; the hindwings with traces of lines along inner margin. Head damaged ; thorax and abdomen cinereous.

Expanse of wings : 16 mm.

One ♂ from above Chimbo, Ecuador, 3000 ft., August 1897 (Rosenberg).

The single specimen is not in good condition ; but its size and coloration distinguish it well from other species of the genus.

#### *Ptychorrhoë* gen. nov.

*Forewings* : triangular ; costa straight, but strongly convex before apex ; hindmargin oblique, faintly elbowed at vein 4, but not curved, as long as inner margin, which is somewhat convex.

*Hindwings* : narrow ; a slight prominence at vein 7 and a strong tooth at vein 6, thence subcrenulate to the apparent anal angle, the abdominal margin below vein 2 being folded under as a flap.

Antennae simple, filiform ; palpi porrect, the terminal joint drooping.

*Neuration* : forewing, cell nearly half of wing ; discocellular concave, oblique below ; first median nervule at one-half, second close before end ; 7, 8, 9 stalked ; 10 anastomosing with 11 far back, and again with 8, 9, forming a double areole ; hindwing with discocellular oblique, and radial from the centre ; 6 and 7 stalked.

Type : *Ptychorrhoë rayata* Dognin (*Opisogonia*).



153. *Spargania approbata* sp. nov.

*Forewings*: dull olive-green mixed with paler; the lines black, dentate and lunulate, more complete than in *S. narangilla* Dogn., and with black costal spots between each line as in that species; first line from one-fourth of costa oblique to median, then incurved, and again oblique to beyond one-third of inner margin, the basal patch crossed by another similar black line; inner edge of central fascia parallel to first line and dentate; outer edge from two-thirds of costa to two-thirds of inner margin, strongly dentate, forming two small acute teeth on each side of vein 6, and two larger and blunter ones on each side of vein 3, incurved beyond cell; the two edges approximating on inner margin; a black cell-spot followed by an indistinct central dark line; three black dentate lines in the marginal area parallel to outer edge of central fascia, the first complete, the second much interrupted, the outermost strongly zigzag, the outer teeth reaching hindmargin; large double black spots on each side of each vein-end, followed by black spots in the dark-green fringe; all the black lines slightly edged with yellowish and pale scales; the area below the median vein flushed with purplish.

*Hindwings*: dull coppery, tinged with greenish at base and inner margin; a faintly darker submarginal curved line; fringe coppery.

Underside of both wings greenish coppery; costa of forewings chequered with pale and black dashes; a pale blotch on costa beyond central fascia, followed by two oblique black shades, the outer the larger; apex paler; marginal line finely black; fringe paler, with black spots beyond veins; hindwings with only faint traces of postmedian line and cell-spot. Head, thorax, and abdomen olive-green, basal segments of abdomen varied with black; fore and middle tibiae green, black-spotted; hind-tibiae wholly green.

Expanse of wings: 42 mm.

Two ♂♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

Allied to *S. narangilla* Dogn.

154. *Spargania colorifera* sp. nov.

*Forewings*: yellowish olive-green, suffused with darker green, and crossed by numerous waved blackish lines, starting from velvety black costal spots finely edged with yellowish scales; basal patch edged by a nearly straight black line from one-fourth of costa to one-third of inner margin, the basal area darker green and containing a black line edged with bluish white and a black spot on costa and inner margin; central fascia dark green, of uniform width, both edges waved and edged with bluish white, with a wavy black central line and the veins blackish, each bluish white line edged by an olive-green one; marginal area traversed by three waved black lines, the first and third partially edged with yellowish scales, the third preceded by bluish white scales, and by a black spot beyond cell; a row of black marginal lunules; fringe with inner half olive-green, the outer half paler, both chequered with darker; cell-spot blackish.

*Hindwings*: dull pink, the base and inner margin tinged with greenish fuscous; traces of two dark lines on inner margin above anal angle; marginal lunules black, preceded by a smoky fuscous submarginal line, thickened towards apex; fringe pale yellowish green, with basal half pink and black.

Underside of forewings dull pinkish, with the linear cell-spot and outer edge of central fascia blackish, and the outer lines blackish towards costa only; a dark

blotch before apex containing two small yellowish spots ; upper half of band beyond central fascia yellow, traversed by a dark line ; costa spotted, yellow and fuscous ; fringe yellowish, chequered with black ; hindwings yellow, speckled with reddish fuscous, with waved median, postmedian, and submarginal lines of the same tint, the last followed by a blotch beyond cell ; fringe yellowish, mottled with reddish fuscous ; cell-spot round, blackish. Palpi dark fuscous mixed with greenish ochreous ; head and thorax olive-green ; patagia green with black scales near base and towards apex ; abdomen green much mixed with black.

Expanse of wings : 30 mm.

One ♂, one ♀, from R. Tanampaya, Bolivia, 1894 (Garlepp).

Easily distinguished by the coloration of the underside of both wings.

### **Stenorrhoë** gen. nov.

*Forewings* : very long and narrow ; costa straight, curved only at apex, which is prominent ; hindmargin obliquely curved.

*Hindwings* : elongate ; hindmargin produced at vein 7, thence slightly curved to vein 2, there strongly truncate to anal angle ; inner margin quite short, but amply developed.

Palpi short ; antennae of ♂ strongly bipectinate to beyond middle ; tongue and frenulum present ; forelegs and middle legs long and well developed, the latter with terminal spurs ; hindlegs quite short and feeble, without spurs.

*Neuration* : forewings, cell two-thirds of wing ; discocellular short, rather oblique ; first median nervule at three-fourths, second at seven-eighths ; radials normal ; 7, 8, 9 stalked ; 10 and 11 free, 10 anastomosing with 11 and again with 8, 9, forming a double areole ; hindwings with cell one-half of wing ; the discocellular oblique ; radial from the centre ; costal anastomosing with subcostal for three-fourths of cell ; veins 6, 7 hardly stalked.

Type : *Stenorrhoë longipennis* sp. nov.

The single species is anomalous in appearance and structure.

### 155. **Stenorrhoë longipennis** sp. nov.

*Forewings* : ochreous, suffused with fulvous, and sprinkled with black scales ; costal edge black ; a slight black line along subcostal vein, and an obscure blackish horizontal streak through cell ; lines blackish ; first from two-fifths of costa to one-third of inner margin, sharply angled in cell near middle ; second from three-fourths of costa to two-thirds of inner margin, also sharply angled outwards on vein 6 ; a dark cell-spot ; a row of neat black marginal dots ; fringe concolorous.

*Hindwings* : ochreous, much dusted with black towards base and along inner margin ; cell-spot and marginal spots as in forewings.

Underside ochreous with black suffusion at base and before outer line of forewings. Head, thorax, and abdomen concolorous ; antennae black.

Expanse of wings : 18 mm.

One ♂ from Castro, Parana.

The pectinations of the antennae are thick and stout and well separated

### **Trichorrhages** gen. nov.

*Forewings* : elongate ; the costa mainly straight, but arched at base, and convex before apex ; apex blunt ; hindmargin obliquely curved ; inner margin at

about one-third from base deeply cleft, the submedian vein being strongly bent upwards above the cleft, each side of the cleft thickly clothed on the upper surface with hairs.

*Hindwings* : with hindmargin and both angles rounded.

Palpi porrect, rostriform, decumbent; antennae simple; abdomen and legs broken.

*Neuration* : forewings, cell less than half the length of wing; discocellular angulated; first median at three-fourths, second close to third; radials normal; 7, 8, 9 stalked; 10 and 11 stalked; 10 anastomosing with 8, 9; hindwings with discocellular oblique, the radial from the centre; 6 and 7 stalked.

Type : *Trichorrhages umbrosa* sp. nov.

#### 156. *Trichorrhages umbrosa* sp. nov.

*Forewings* : ochreous suffused with shades of brown and green, among which can be discerned a darker basal patch, a broad central fascia, the outer edge of which is lunulate, and a pale lunulate submarginal line, preceded and followed by darker shades; marginal spots black and round; fringe blackish.

*Hindwings* : pale slaty grey, darker along hindmargin; fringe blackish.

Underside of forewings dull dark cinereous; of hindwings paler; cell-spots dark. Head, palpi, and thorax olive-green and brown; abdomen wanting.

Expanse of wings : 38 mm.

One ♂ from Popayan, Colombia (Lehmann).

The unique example is very much wasted, and an accurate description is impossible.

#### 157. *Xanthorhoë fragilis* sp. nov.

*Forewings* : pale greyish green, crossed by waved red-brown lines, which are all thickened on costa, and densely dusted with red-brown striae; three red-brown lines in basal area, all angled on the subcostal vein, then vertically waved to inner margin; central fascia with its inner edge formed of one and its outer of three similar lines, but the outer three are angulated on vein 4 as well as on vein 6, incurved to vein 2, thence vertical to inner margin; cell-spot small, blackish, close beyond the inner edge of the fascia; marginal area crossed by three waved brown lines, all thickened and somewhat confluent at costa and between veins 3 and 4; marginal line fine, blackish, swollen between the veins; fringe red-brown, with the base conspicuously paler.

*Hindwings* : whiter, tinged with greenish, with all the outer lines repeated, but indistinct towards costa; cell-spot small, blackish; hindmargin subdentate, the tooth at vein 4 more marked.

Underside reddish grey, flecked with dark, and with all the chief lines darker; marginal spots much more distinct than above. Head, thorax, and abdomen dull greenish grey, speckled with red-brown.

Expanse of wings : 35 mm.

One ♂ from Bogotá, Colombia (Child).

A thinly scaled and rather fragile-looking species; the veins fine; palpi shortly porrect; the pectinations of the antennae in ♂ full; discocellular of hindwings oblique; radial from the centre.

## SUBFAMILY EUDULINAE.

158. *Eudule circumducta* sp. nov.

*Forewings*: orange-red; the costa and hindmargin narrowly blackish; the costal streak is quite narrow at base, widening gradually to apex where the dark margin is broadest.

*Hindwings*: with only the hindmargin blackish, this narrowed to a point above anal angle and before apex on costa.

Underside the same. Head, thorax, and abdomen red; antennae and palpi black.

Expanse of wings: 26 mm.

One ♂ from Chimbo, Ecuador, 1000 ft., Aug. 1897 (Rosenberg).

Nearest to *E. cytherea* Schaus.

## SUBFAMILY HETERUSIINAE.

159. *Heterusia magnifica* sp. nov.

*Forewings*: bright red; the inner margin narrowly, the hindmargin more broadly black; costa with two triangular black blotches at base, an oblong broader one at middle, reaching to median vein, and a bar beyond it to hindmargin; all the blotches separated from each other at costal edge by a sulphur-yellow spot; fringe black, chequered with white between the veins.

*Hindwings*: with the black hindmarginal border pierced by long red streaks between the veins and shorter ones on the veins; and with three black bands interrupted by red along the fold of the cell; the first basal broad; the second strongly angulated on the radial; the third more broadly interrupted in the middle, consisting of one large oblong blotch from costa, and four smaller subquadrate ones from inner margin, separated by the red veins; fringe mottled, black and white; wholly white round the apex.

Underside of forewings like upper, but the apex beyond the postmedian band pale sulphur-colour with a row of oblong black blotches on the veins; the fringe sulphur-colour with black mottlings beyond the veins; a blotch on the subcostal vein at base, and vein 8, across the postmedian band, sulphur-colour; of hindwings with the red spaces all sulphur-colour, and the veins delicately marked with the same colour; the fringe the same, with slight black mottling. Face and palpi hairy, black mixed with pale sulphur; thorax and abdomen black; fillet and tips of shoulders and of patagia tinged with pale; segmental rings of abdomen narrowly pale above, becoming more broadly so on the sides and almost wholly sulphur-coloured underneath; legs black, varied with pale hairs.

Expanse of wings: 30 mm.

One ♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

160. *Heterusia obliquistriga* sp. nov.

*Forewings*: dull olive-brown; two slightly oblique yellowish white streaks from costa; the first at one-third, the second a little beyond two-thirds; the first reaching median vein, where it is widened and continued as a more oblique whitish hyaline streak towards the hindmargin between veins 2 and 3; the second stopping short at vein 6.



*Hindwings* : uniform olive-brown ; fringe of both wings concolorous.

Underside of forewings like upper, but the brown speckled with paler ; of hindwings dirty whitish, coarsely speckled with fuscous : the margin from before apex to anal angle broadly olive-brown ; a dark cell-spot. Head, thorax, and abdomen brown ; abdomen beneath whitish.

Expanse of wings : 30 mm.

One ♂ without locality, in the Felder collection.

161. *Trochiodes inexpectata* Stand. ab. *dilatata* nov.

Differs from the type form in having the middle of hindmargin of forewings white, above and below. In the hindwings the white area is much more extensive, the base of the wing being only narrowly blackish and the costal margin the same.

One ♂ from Bogota collection.

Having only seen the one example described, I leave it as an aberration only ; it is probably a good species.

SUBFAMILY PALYADINAE.

162. *Aplogompha oppletaria* sp. nov.

*Forewings* : pale straw-colour ; costa from base to middle with four irregular confluent brown spots, containing metallic scales, their lower edge ragged, and produced very irregularly as brown strigae to inner margin : outer third and fringe brown, the submarginal line indicated by a straw-coloured spot on costa and at anal angle, and irregularly varied with metallic scales and spots ; a marginal line of metallic dashes.

*Hindwings* : with submarginal curved row of metallic drops and marginal line of metallic dashes ; traces of brown strigae along inner margin, indicating an antemedian and postmedian line ; fringe straw-colour, darkening towards apex, which is marked with a slight fuscous cloud.

Underside similar, without metallic scales ; the apical blotch of hindwing larger and deep brown. Head, thorax, and abdomen straw-colour, discoloured with darker scales, especially the abdomen, which has a brown ring near base ; antennae brown.

Expanse of wings : 23 mm.

Several examples from Paramba, Ecuador, 3500 ft., March 1897, dry season (Rosenberg). In one example there are no brown strigae on either wing.

163. *Trichogompha costimaculata* sp. nov.

*Forewings* : mouse-colour ; the basal two-thirds of wing covered with dark brown confluent striae, or wholly suffused with brown, leaving only a few pale transverse streaks, the suffusion extending along inner margin nearly to anal angle ; the outer third of this brown area on costa is supplanted in the ♂ by a triangular blotch of paler grey than the ground-colour, edged with ochreous ; in the ♀ by a blotch wholly ochreous, limited by a band of brown striae from costa to just before anal angle, followed by an oblique row of metallic spots and a submarginal metallic line, beyond which the marginal area is again suffused with brown ; fringe mouse-colour.

*Hindwings* : with basal two-thirds only irregularly striated with brown ; the metallic lines more developed.



Underside dark grey-brown ; the costal blotch pale ochreous in both sexes, with the costa itself above the blotch deep yellow ; a slight pale spot in middle of hindwings, which in the ♀ is visible also above. Head and shoulders pale ochreous, paler in the ♀ ; thorax and abdomen pale grey-brown in ♀, dark grey-brown in ♂ ; the basal segment of abdomen and the anal tuft of the ♂ ochreous.

Expanse of wings : 26 mm.

A pair from Paramba, Ecuador, Jan. to May 1897.

#### SUBFAMILY NEPHODIINAE.

##### 164. *Astyochia nigrita* sp. nov.

*Forewings* : smoky black, the veins and costa deep black ; space between the median and submedian veins and basal half of cell semi-transparent ; a white blotch towards apex beyond cell, extending from vein 4 to 7 ; fringe black.

*Hindwings* : white, with a broad deep black border along costal and hindmargins ; veins and inner margin narrowly deep black.

Underside similar ; the semi-transparent spaces on forewings whiter. Head, thorax, and abdomen deep black ; tongue bright yellow ; tuft of hair on inner margin of hindwings grey.

Expanse of wings : 24 mm.

Two ♂♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

##### *Hyalocampa* gen. nov.

*Forewings* : with costa nearly straight, curved just before apex ; apex rounded ; hindmargin rounded, not very oblique ; anal angle distinct.

*Hindwings* : with both angles and the hindmargin rounded.

Antennae of ♂ bipectinated nearly to apex ; of ♀ simple ; palpi porrect, slender, short ; tongue and frenulum present ; hind-tibiae with four short spurs.

*Neuration* : forewings, cell three-fifths of wing, constricted at its extremity ; discocellular short, inangulated in middle ; first median nervule at three-fifths, second at seven-eighths ; radials normal, the lower one fine ; 7, 8, 9 stalked ; 10 and 11 free ; 11 connected by bar with 12, 10 anastomosing with 11 ; hindwings with costal approximated to subcostal, and united by a bar just before middle of cell ; vein 7 from before end of cell ; first median nearly at one-half, second just beyond three-fourths. In the forewing in both sexes veins 3 and 7 are strongly bent downwards, approaching veins 2 and 6 on hindmargin ; in the ♂ the median and submedian veins are strongly concave towards each other near base ; the foveal bar is thick and strongly marked, lying on a very fine curved fold from submedian fold to median vein ; above the curve of the submedian vein a straight chitinous bar appears, covered with black scales, the wing membrane above it being finely fluted ; the wing membrane perfectly transparent, without pigmented scales.

Type : *Hyalocampa specularis* sp. nov.

##### 165. *Hyalocampa specularis* sp. nov.

*Forewings* : perfectly hyaline ; except along the margins and an oblique bar across the end of cell to hindmargin at vein 3, where, as well as at apex, the hindmarginal border is wider ; all the veins black.

*Hindwings* : without the oblique bar, and with the inner margin very narrowly black.

Underside the same. Face and a spot in front of thorax white ; rest of head and thorax and the abdomen blackish, underneath whitish.

Expanse of wings : 39 mm.

One ♂, one ♀ from Cachabí, Ecuador, low country, January 1897 (Rosenberg).

**Lissocharis** gen. nov.

*Forewings* : costa curved throughout ; apex and hindmargin rounded.

*Hindwings* : with hindmargin and both angles well-rounded.

Antennae of ♂ delicately pectinated, the pectinations short, thick, claw-shaped, with a bristle at end; apical third subserrate; palpi damaged; tongue and frenulum present; legs long; hind-tibiae with four short spurs.

*Neuration* : forewing, cell nearly two-thirds of wing, constricted towards extremity, the subcostal vein especially being deflexed; discocellular inangulated close below upper end of cell, then oblique and angulated outwards at middle; the lower third vertical; first median nervule at one-half, second at five-sixths; lower radial very fine, from the outward angulation of discocellular, upper radial from the deflexed end of cell; 7, 8, 9, 10 stalked, 11 free from cell, and anastomosing with 12; 9, 10 coincident, anastomosing with 11, 9 again anastomosing with 8; foveal bar strongly developed; median and submedian veins concave towards each other at base; hindwings with costal and subcostal closely approximated at base; vein 7 before end of cell; discocellular inangulated below 6. The hindwing slightly shouldered at base; the costa sinuate.

Allied to *Hyalocampa* Warr.

Type : *Lissocharis nigrivenata* sp. nov.

166. **Lissocharis nigrivenata** sp. nov.

*Forewings* : semihyaline white; all the veins thickly black; costal area above subcostal vein black; hindmargin broadly black; an oblique black discal blotch touching costal black margin, and joining an equally broad black blotch between veins 3 and 4 running into hindmarginal border, leaving two white subapical spots separated by vein 6; lower radial not marked with black and very indistinct.

*Hindwings* : with the veins black; a black margin broad along costa to apex, then narrowing to anal angle; inner margin narrowly black.

Underside the same; the discocellular of hindwings more broadly blackened.

Head, thorax, and abdomen greyish black; the patagia whitish; face white.

Expanse of wings : ♂ 29 mm.; ♀ 26 mm.

One ♂, one ♀ from Paramba, Ecuador, January to May 1897.

167. **Nipteria conjunctiva** sp. nov.

*Forewings* : silky, pale fuscous grey; a darker cell-spot, and two lines meeting at middle of inner margin, one from one-third of costa, faintly convex outwards, the other from two-thirds of costa, more or less parallel to hindmargin; fringe concolorous, darker beyond veins.

*Hindwings* : with small dark cell-spot and obscure line beyond middle parallel to hindmargin.

Underside darker, dappled with fuscous; the outer lines and cell-spots thick and

distinct. Vertex, thorax, and abdomen concolorous with wings ; face and fillet pale ochreous.

Expanse of wings : 41 mm.

One ♂ from Castro, Parana, November 1897 (E. D. Jones).

#### 168. *Nipteria foedata* sp. nov.

*Forewings* : dull dirty whitish, slightly brown-tinged, especially along costa and hindmargin ; first line at one-fourth, nearly vertical, slightly waved ; outer line at three-fourths, marked by dark dashes on the veins, angled on vein 6, then oblique inward, approaching first line on inner margin ; fringe dull brown ; cell-spot black.

*Hindwings* : paler, with traces of a postmedian line, more distinct towards inner margin ; fringe pale, becoming brown towards anal angle.

Underside dull whitish ; both wings with an obscure postmedian line marked by black vein-dots, and not corresponding with the course of the line above ; forewings with black cell-spot. Face and thorax dull greyish ochreous ; abdomen paler.

Expanse of wings : 35 mm.

One ♂ from Popayan, Colombia (Lehmann).

Placed in *Nipteria* provisionally : the apex of forewings is slightly produced ; vein 11 anastomoses with 12, veins 9 and 10 coincident anastomose with 11, 9 afterwards anastomosing with 8.

#### 169. *Nipteria funeralis* sp. nov.

*Forewings* : smoky brown-black ; costa marked with blackish strigae and a few whitish intervals ; costal and apical regions dappled with dark and paler strigae ; a subquadrate white costal blotch before apex, from the inner edge of which an obscure darker line can be traced ; cell-spot black ; fringe concolorous, slightly mottled with paler.

*Hindwings* : striated throughout with darker, and deeper coloured towards hindmargin ; cell-spot black ; fringe blackish, unmottled.

Underside with ground-colour paler, and all the markings more distinct ; the hindwings with ground-colour pale greyish white, with a distinct blotched darker postmedian line. Head, thorax, and abdomen concolorous.

Expanse of wings : 45 mm.

One ♂ from La Merced, Chanchamayo, Peru.

#### 170. *Nipteria intervallata* sp. nov.

*Forewings* : ochreous grey, peppered with darker ; the lines darker, at nearly equal intervals ; first curved at about one-fifth, second straight from middle of costa to middle of inner margin, just in front of the small black cell-spot ; third parallel to second, from two-thirds of costa to two-thirds of inner margin ; traces of a waved submarginal line ; a slight dark marginal line, thickened with spots between the veins ; fringe paler.

*Hindwings* : with the inner line absent ; both wings are somewhat darker-tinted towards hindmargin.

Underside the same : marginal area of forewings distinctly darker except at apex. Head and shoulders yellow ; thorax and abdomen concolorous with wings.

Expanse of wings: 44 mm.

One ♂, one ♀ from Paramba, June 1897, dry season, 3500 ft. (Rosenberg).

171. *Nipteria* (?) *satellites* sp. nov.

*Forewings* : smoky blackish ; a triangular dull white blotch lying between median and submedian veins, rightangled above the anal angle, with a rounded projection in middle of wing from median to subcostal ; the veins dark across it ; traces of a paler submarginal line from before apex to end of vein 2, forming two slight pale patches before costa, and a white spot between veins 3 and 4 ; fringe dark.

*Hindwings* : dark smoky grey, with the central space paler ; the veins dark.

Underside of forewings like upper, but the dark markings brown grey ; an apical white spot. Hindwings with smoky brown curved central band followed by a whitish one ; traces of a pale submarginal line ; a whitish marginal spot between veins 3 and 4. Head, thorax, and abdomen dull grey ; palpi bright yellow.

Expanse of wings: 35 mm.

One ♂ from between Cachabí and Paramba, February 1897 (Rosenberg).

Veins 6, 7, 8, 9 stalked ; 10 and 11 stalked, 11 anastomosing at a point with 12 ; cell two-fifths of wing.

172. *Nipteria* *satyrata* sp. nov.

*Forewings* : dull smoky grey-brown, darker along costa and hindmargin, which are dappled with irregularly blotched transverse striae ; a smoky dark cell-spot ; an indistinct oblique line from middle of inner margin to four-fifths of costa where it ends in a dark blotch, the lower part being marked only by vein-dots ; fringe dull grey, mottled with dark at the vein ends.

*Hindwings* : with a broad curved central band showing through from the underside, beyond which a paler space intervenes before the dark hindmargin.

Underside much clearer ; the oblique line of forewings black below costa, followed by a pale whitish blotch between veins 4 and 6 ; the space below the median vein dull and blurred ; hindwings with the broad central band and hindmargin blackish. Head, thorax, and abdomen smoky brown-grey.

Expanse of wings : 52 mm.

One ♀ from La Cnlata, Merida, 1897 (Briceño).

Neuration as in *N. incoloraria* Guen. ; but a enriens anomaly occurs in the forewings, where vein 5 is connected by a bar with 6.

173. *Nipteria* *sericea*.

*Deilinia sericea* Warr., Nov. Zool. IV. p. 462.

I have seen another pair of this insect, and find that it should be transferred to the American Genus *Nipteria* ; the foveal bar, which is present, though not conspicuous, had escaped my notice. In one ♀ the upper radial is stalked with 7, 8, 9, 10 ; in the ♂♂ and the second ♀ it rises from the upper angle of cell.



174. *Nipteria subcomosa* sp. nov.

*Forewings* : dull semi-transparent grey, with all the veins slightly darker ; fringe concolorous.

*Hindwings* : the same.

Underside rather darker, especially in the hindwings. In the ♂ the wings are covered throughout with short glistening hair-like scales, while the whole of the cell and the submedian fold beneath it bear thick tufts of grey down, which are visible as a dark shade above. These tufts of down are evidently soon rubbed off, as in some of the examples there is no trace of them, the whole wing appearing thickly haired. Face, palpi, vertex, shoulders, and basal joint of antennae yellow ; thorax and abdomen grey.

Expanse of wings : ♂ 35 to 40 mm ; ♀ 35 mm.

Three ♂♂ from Cachabí, low country, January 1897 (type), and several of both sexes from Paramba, June 1897, dry season, 3500 ft. (Rosenberg).

Druce's *perimede*, which must otherwise be like this species, is said to have the head parts all brown.

**Parallage** gen nov.

*Forewings* : elongate, costa faintly curved ; apex blunt ; hindmargin obliquely rounded ; anal angle hardly expressed.

*Hindwings* : with both angles rounded off ; hindmargin faintly indented beyond cell ; antennae (♀) subserrate, with short bristles ; palpi porrect, slender. Tongue and frenulum well developed.

*Neuration* : forewings, cell more than half as long as wing ; discocellular inangulated, short, the subcostal being strongly deflexed at extremity ; first median nervule at one-half, second at five-sixths ; lower radial and third median from lower end of cell ; upper radial from the upper angle ; veins 7, 8, 9 from the bend in the subcostal ; 10 from the same point ; 11 well before 10, anastomosing with 12, 10 anastomosing with 11 and subsequently with 8, 9 ; the foveal bar distinct even in the ♀ ; hindwings, cell and discocellular as in forewings ; costal approximated to subcostal near base only ; 6, 7 from upper angle of cell ; medians as in forewing ; no radial ; scaling sparse ; the wings very transparent.

Type *P. membranacea* sp. nov.

I have referred this genus to the *Geometridæ*, notwithstanding the point of origin of the lower radial, which must be considered as a remarkable abnormality ; in all other respects the insect agrees with Geometrid structure, and especially, in the presence of the foveal bar, with the *Nephodiinae*.

175. *Parallage membranacea* sp. nov.

*Forewings* : pale grey, almost diaphanous, crossed by oblique zigzag lines of dark fuscous, which form blackish dashes where they intersect the veins ; the first from one-third of costa to one-fourth of inner margin ; second, third, and fourth at equal distances from each other, the second from middle of costa, the fourth from three-fourths, the third traversing the discocellular, the second and third not visible below the median, the fourth faint and oblique to inner margin before middle ; beyond these three more, of which the middle one is fainter, the first reaching inner margin beyond middle and the last at anal angle ; fringe (worn) pale grey.



*Hindwings* : with traces of darker curved postmedian and submarginal lines, and a dark mark on discocellular.

Underside glossy, with the markings showing through. Head, thorax, and abdomen cinereous ; tips of the patagia paler grey.

Expanse of wings : 35 mm.

One ♀ from Bogotá, Colombia.

The type specimen is not in perfect condition ; superficially the insect considerably resembles a *Graphidipus*.

#### 176. *Psilosetia pura* sp. nov.

*Forewings* : shining white ; costa, especially towards apex, grey ; fringe grey.

*Hindwings* : white, with grey fringe.

Underside white ; fringe grey. Head, thorax, and abdomen white ; face and shoulders yellowish-tinged.

Expanse of wings : 44 mm.

One ♂ Merida, Venezuela (Briceño) (type) ; one ♂, one ♀, Paramba, Ecuador.

#### SUBFAMILY BRACCINAE.

#### 177. *Nelo divisa* sp. nov.

*Forewings* : brown-black ; a horizontal elongated red blotch from near base to two-thirds of wing, lying between the median and submedian veins, both its ends pointed, the upper edge projecting in the middle a little above the median vein ; beyond the cell a square red spot ; fringe black.

*Hindwings* : entirely black.

Underside paler ; costa and hindmargin of forewings and the whole of the hindwings grey-brown, with the veins black. Head, thorax, and abdomen black ; abdomen whitish below ; shoulders with a lateral red spot.

Expanse of wings : 26 mm.

One ♂ from Paramba, Ecuador.

#### GENUS STENELE Wlk. II. p. 356.

I find that the genus *Dichostrepsia*, described by me in Nov. Zool. II. p. 121, must sink to *Stenele*. The distortion of the median and submedian veins is often scarcely perceptible, though the bladdery space below the median is always present. The nomenclature of *Stenele*, as given by me in Nov. Zool. I. p. 412, and made without denuding the insect, requires correction. In the forewings, veins 7, 8 are stalked ; 9 and 10 are free from the cell ; 10 anastomoses with 11 ; 9 anastomoses with 10 and 11, and subsequently with 8 (or 9 and 10 stalked anastomose conjointly with 11).

The insect which I made the type of *Dichostrepsia*, viz. *tricolorata*, is manifestly the same as *Nelo solimara* Th. Mg., Le Naturaliste, 1892, p. 262, which will stand as *Stenele solimara* Th. Mg. ; and to this genus also must be referred, judging from the description, *Melanchroia* (?) *aurantiaria* Th. Mg., Ann. S.E. Fr. 1895, Bull. p. cclxxv.

178. *Stenele ruberrima* sp. nov.

*Forewings*: coppery red; the apical half black, its edge forming small teeth on the veins, and an acute angle on the submedian, and reaching inner margin at three-fourths, farther from the anal angle than in *S. tripuncta*; the three pale spots smaller and darker than in *tripuncta*, the upper one consisting of two, obliquely contiguous, and not reaching below vein 5.

*Hindwings*: with the apex broadly black, the teeth on the veins short.

Underside fulvous-orange in forewings, the costa yellow; the three pale spots as large as in *tripuncta*; the apical area beyond them greyish red-brown; hindwings yellow, with the veins finely orange-fulvous; apex, margin, and fringe red-brown, slightly darker at the vein ends. Palpi fuscous; face ochreous; vertex ochreous with two black dashes; collar black, ochreous at sides; antennae black; thorax and abdomen like wings. Underside of abdomen ochreous; a single blackish lateral stripe.

Expanse of wings: 48 mm.

One ♂ without locality. Closely related to *S. tripuncta*, and certainly S. American.

179. *Stenele tripuncta* sp. nov.

*Forewings*: fulvous orange; the apical half black; the edge, which is somewhat inconcise, runs from middle of costa to shortly before anal angle, slightly bent on the median, and forming a small acute angle on the submedian; in the black area are three pale yellowish hyaline spots; one subquadrate towards costa between veins 7 and 4; the other two smaller towards hindmargin on each side of vein 3; fringe concolorous.

*Hindwings*: with a narrow black margin from before apex to anal angle, running up and forming acute wedge-shaped marks along the veins; fringe black.

Underside of forewings yellow suffused with fulvous; the pale spots larger; the apical area beyond them browner; edge of dark area with an acute subcostal tooth and right-angled at vein 2; hindwings yellow with all the veins thickly fulvous orange and partially confluent; a similar coloured spot on the discocellular; the wedge-shaped marginal marks with bright yellow spots between them. Palpi fuscous; face ochreous white; vertex and collar black mixed with yellow; antennae black; thorax and abdomen concolorous with wings; abdomen pale ochreous beneath, with two fine brown parallel lateral lines.

Expanse of wings: 43 mm.

One ♂ from the Amazons.

*Taraxineura* gen. nov.

*Forewings*: with costa straight nearly to apex, which is rounded; hindmargin well rounded.

*Hindwings*: with both angles and the hindmargin rounded.

Antennae (♂) strongly bipectinated to apex; palpi porrect; tongue and frenulum present; hindtibiae with four spurs; anal tufts largely developed. Besides the foveal bar, the forewings have a very distinct but small fovea developed.

*Nervation*: forewings, cell quite two-thirds of wing; discocellular very fine, inangulated above the middle; first median at five-eighths of cell, second at eleven-twelfths; lower radial missing, replaced by a fine fold, shortly becoming obsolete;

upper radial long-stalked with 7 from the end of cell, both strongly bent downwards, 6 terminating at the point in hindmargin where 5 would normally end; 8, 9 stalked; 10 and 11 stalked, 10 anastomosing with 8, 9; hindwings, with venation normal; costal approximated to subcostal for nearly half of cell, 7 from before end; first median at one-half, second at seven-eighths. No radial.

Type: *T. carbonaria* sp. nov.

A development of *Melanchroia*.

#### 180. *Taraxineura carbonaria* sp. nov.

*Forewings*: coal-black, without markings, except a large subquadrate white blotch at and beyond the end of cell; fringe black.

*Hindwings*: wholly black.

Underside the same. Head, thorax, and abdomen black; collar, tongue, and anal tufts deep ochraceous. From the femoro-tibial joint of forelegs rises a short pencil of black hairs and a long ochraceous process without scales.

Expanse of wings: 34 mm.

One ♂ from Bogotá, Colombia.

#### SUBFAMILY ASCOTINAE.

#### 181. *Bronchelia subalbida* sp. nov.

*Forewings*: dingy grey, with darker grey specklings and markings; the three lines much as in *fraternaria* Guen., but only dark fuscous, not black; the exterior line more oblique outwards from costa and much less strongly dentate; the whole hindmargin darker grey, containing the uniformly lunulate submarginal line; marginal line fuscous, interrupted at the veins; cell-spot dark grey; fringe grey.

*Hindwings*: the same, the cell-spot large and distinct; the exterior line uniformly dentate and nearly straight.

Underside dull dirty whitish, with a broad smoky grey marginal fascia; forewings dappled with grey, the costa ochreous; the three lines marked as dark spots on costa, the exterior grey as far as the lower radial. Face and palpi dull brown; vertex pale grey; collar and thorax grey tinged with ochraceous; abdomen grey.

Expanse of wings: 65 mm.

One ♂ from the interior of Surinam, September 1892 (C. W. Ellacombe).

Distinguished from *fraternaria* Guen., by the broader, less elongated wings, with less strongly dentate margins, and by the whitish underside with complete dark marginal band.

Another ♂ from Castro, Parana, agreeing with the type above described in breadth and outline of wings has the ground-colour whitish, thickly strewn with olive-grey speckles, and the outer line of forewings as strongly dentate as in *fraternaria*. The underside dull whitish, with the marginal band narrower and less strongly marked, especially in the hindwings.

#### 182. *Bryoptera subbrunnea* sp. nov.

*Forewings*: whitish, speckled and along the costal region suffused with greyish ochreous; the lines indistinct and interrupted, all followed by an ochreous grey shade, making them appear double; first, slightly marked with blackish scales, curved, at one-fourth; outer line at two-thirds, parallel to hindmargin, slightly

crenulate and blackish ; closely preceded by a less distinct but parallel median line ; submarginal line waved, followed by an ochreous grey shading ; marginal spots dark ; cell-spot indistinct.

*Hindwings* : without first line.

Underside of both wings smoky brown. Head, thorax, and abdomen like wings ; palpi externally and a bar towards top of face brown.

Expanse of wings : 30 mm.

One ♂ from Paramba, Ecuador, January to May 1897.

Distinguished by the uniform brown underside.

### 183. *Cymatophora apicalis* sp. nov.

*Forewings* : smooth olive-grey, slightly speckled with darker ; first line at one-fourth, bent below costa, then oblique inward ; median shade vertical, thick and diffuse, olive-fuscons, at two-fifths ; outer line from two-thirds of costa, also fuscons olive and diffuse at costa and inner margin, where it joins the median shade ; cell-spot black ; submarginal line very indistinct, marked by slight dark lunules, and more visible beyond cell, where it crosses the beginning of a large triangular olive-fuscons blotch lying on the margin below apex ; a row of black marginal spots ; fringe concolorous with wings, but olive-fuscons beyond the triangular blotch.

*Hindwings* : paler, with two straight olive-fuscons lines, antemedian and postmedian, diverging and becoming obsolete towards costa, and plainer on inner margin where they are slightly geminated ; submarginal line obscure except at anal angle ; cell-spot and marginal spots as in forewings.

Underside greyish ochreous, darker in forewings, speckled with fuscons, the markings of upperside partially reproduced. Thorax and abdomen like hindwings ; head and shoulders concolorous with forewings.

Expanse of wings : 44 mm.

Three ♂♂ from Castro, Parana, February 1897 (E. D. Jones).

The description is taken from a fresh, well-marked specimen ; in many cases the markings are much less distinct, and the ground-colour browner.

### 184. *Cymatophora* (?) *commaculata* sp. nov.

*Forewings* : dingy ochreous whitish, the costa yellower ; the lines bronzy grey, macular and interrupted ; three in the basal field, curved and starting from large costal blotches ; two postmedian, consisting of coarsely marked lunules distinct only in lower half of wing, and ending at and just beyond middle of inner margin ; two more submarginal ; the last four all confused and lost in a dull bronzy grey blotch occupying the apex ; a row of blackish spots on margin between the veins ; a black cell-spot ; fringe ochreous and grey.

*Hindwings* : similar ; all the lines curved, those near base broken up into spots.

Underside similar, but the markings still more confused ; a broad diffuse submarginal band, the apex of forewings, and a spot below middle remaining paler. Head, thorax, and abdomen ochreous mixed with grey.

Expanse of wings : 36 mm.

One ♀ from Paramba, Ecuador, January to May 1897.

Distinguished from other species by the blotched character of the markings. It is referred to *Cymatophora* provisionally.



185. *Cymatophora ochrea* sp. nov.

*Forewings*: yellowish clay-colour, speckled with dark fuscous; a diffuse curved fuscous basal shade at one-fourth; a broad diffuse nearly straight dark fuscous median shade, followed by a thick dentate-edged postmedian line, which joins the median shade on inner margin, and projects slightly along veins 3 and 4; the band between this line and the submarginal is paler, less speckled with fuscous; submarginal line fine, but blotched on costa, beyond cell, and at inner margin; the blotch beyond cell connected with hindmargin by a triangular diffuse fuscous patch; marginal spots dark fuscous; fringe concolorous; cell-spot dark fuscous, lost in the median shade.

*Hindwings*: with two dull fuscous lines, median and postmedian, near together; a less distinct dark submarginal line.

Underside similar, but all the tints duller. Thorax and abdomen like wings; face, vertex, and collar yellower.

Expanse of wings: 30 mm.

One ♂ from Chiriqui, Panama.

The hindmargin of hindwings is slightly and irregularly indented beyond cell. The forewings have no fovea, but it may be left in *Cymatophora* provisionally.

186. *Cymatophora paraphiata* sp. nov.

*Forewings*: pale grey, more or less suffused with dull tawny, speckled and striated with fuscous; the lines fuscous, irregularly waved; first at one-fifth, second at two-fifths, both obscure, slightly bent out in cell; outer line more distinct, denticulate outwards on the veins, and somewhat projecting between veins 6 and 3; submarginal indistinct, pale, preceded and followed by dark striae partially confluent into clouds; fringe grey with dark spots at base between the veins; cell-spot grey, indistinct; a fulvous cloud below costa beyond the outer line; a diffuse pale space at apex and anal angle.

*Hindwings*: with the extreme base pale, the lines as in forewings, the dark dusting stronger beyond first line; area beyond submarginal line paler, without the tawny suffusion of the central area.

Underside whiter, the speckling coarser; marginal third much darker, fulvous and fuscous, less marked in the hindwings; cell-spots blackish, distinct. Head, thorax, and abdomen like wings.

Expanse of wings: 43 mm.

One ♀ from British Guiana.

The reference to *Cymatophora* is provisional. The hindmargin of both wings is subcrenulate. The venation is somewhat abnormal, the cell being only one-third as long as wing; veins 3 and 4 from the lower end of cell; the lower radial from above the middle of discocellular; 7, 8, 9 stalked, 10 and 11 free. The costa of forewings is rather prominently arched near base and incurved at middle.

187. *Cymatophora ustifumosa*.

*Bryoptera* (?) *ustifumosa* Warr. Nov. Zool. IV. p. 466 ♀.

Having lately seen twelve specimens (six ♂♂, six ♀♀) of this insect from Parana, Entre Rios, Argentina, I can refer it to the genus *Cymatophora*, and describe the ♂, which differs very considerably from the ♀, having the hindwings white, while those of the ♀ are smoky fuscous.



♂. *Forewings*: whitish, fuscous-speckled; markings blackish fuscous, tinged with olive; a short costal mark near base; first line curved, from one-third of costa to one-fourth of inner margin, bent in cell and again on submedian vein; outer line from costa at two-thirds to three-fifths of inner margin, oblique outwards at first and forming a blunt projection beyond cell, then sinuous inwards, thickened at the veins; cell-spot large and round; the whole area between the lines filled up with dark fuscous-olive, except a slight space on inner margin beyond first line and a larger space on costa before second line, which below the middle is preceded by a smaller spot; submarginal line white and waved, distinct only from costa to vein 4, being there preceded by a dentate-edged blotch of olive-fuscous strigae and followed by a less marked fuscous cloud, which is also slightly reproduced above anal angle; the whole of the anal area below middle and beyond second line is whitish; marginal spots deep black, connected by a black line; fringe whitish tinged with olive and grey.

*Hindwings*: whitish, speckled with olive-fuscous, especially towards hind and inner margin; on the inner margin are traces of the commencement of three blotched lines, the two outer being again slightly marked beyond cell.

Underside duller white, with the markings indistinct. Head and thorax olive-fuscous; abdomen whitish, basal segment with two large olive-fuscous blotches, the remaining segments with a pair of smaller spots; legs whitish; foretarsi chequered fuscous and whitish.

Expanse of wings: 28 mm.

Six ♂♂ from Parana, Entre Rios, Argentina.

#### 188. *Hymenomima camerata* sp. nov.

*Forewings*: dull whitish, faintly grey-speckled, more thickly along the costa and hindmargin; the veins and lines dark grey; the lines below vein 6 all parallel to hindmargin; first curved, close to base; second a little before the middle, projecting roundly in cell and on submedian fold, the bend in cell touching the discal spot; outer line dentate, from two-thirds of costa to middle of inner margin, excurved beyond cell; submarginal pale, zigzag, between two thick dark grey shades, formed of wedge-shaped confluent marks; a row of blackish marginal spots between the veins, produced to touch the outer dark shade; fringe grey.

*Hindwings*: without first line; the cell-mark crescentic and free.

Underside dull whitish, with diffuse dark grey marginal border; cell-spots and outer lines dark grey. Head, thorax, and abdomen whitish, speckled with blackish; palpi and antennae darker.

Expanse of wings: 30 mm.

One ♀ from Paramba, Ecuador, January to May 1897.

#### 189. *Lepiodes exilis* sp. nov.

*Forewings*: pale grey, dusted with darker; the lines fine, blackish; the first three curved, the submarginal alone dentate-lunulate; the three lines from black costal marks at one-fifth, two-fifths, and three-fifths respectively, obliquely curved outwards to median vein, then vertical, the outer incurved to vein 2; median line somewhat nearer outer than inner, preceding the black cell-spot; the first line is preceded and the outer followed by a rufous shade; submarginal preceded by a fascia of confluent blackish-edged lunules; a fine black marginal line: fringe grey.

*Hindwings* : similar, but without first line.

Underside grey with a yellowish tinge ; both wings with dull blackish marginal fasciae and large roundish black cell-spots. Head, thorax, and abdomen grey.

Expanse of wings : 23 mm.

One ♀ from Ciudad Bolivar, Venezuela, August 1898 (S. Klages).

In forewings vein 11 anastomoses with 12 for some distance, then with 7, 9, 10 which are stalked ; 8 missing ; all the veins very fine.

190. *Stenalcidia grisea* sp. nov.

*Forewings* : dark hoary grey ; the lines indistinct, marked on the costa by black spots ; first at one-fourth, second just before middle, outer at two-thirds, marked by blackish dots on veins, and followed between veins 3 and 4 by a darker grey-brown blotch ; submarginal pale grey, regularly undulated, preceded by a dark grey lunulate shade ; black marginal spots ; fringe concolorous.

*Hindwings* : the same without first line ; a slight dark cell-spot.

Underside dull smooth dark grey, with cell-spots and outer lines blackish. Face and palpi blackish grey ; vertex, thorax, and abdomen like wings.

One ♀ from Castro, Parana, December 1898 (E. D. Jones).

191. *Stenalcidia punctilineata* sp. nov.

*Forewings* : brownish ochreous ; the lines all marked by black spots on veins ; the first and third double ; first at one-fourth, the inner arm running into base as a black streak ; outer from two-thirds of costa to before middle of inner margin, with its outer arm developed into a series of black wedge-shaped marks with a pale dot at base, and joined on inner margin by the spots representing the central line : a submarginal row of dark wedge-shaped markings, preceded by a dark cloud beyond cell ; marginal spots black, distinct ; cell-spot black ; fringe full, the inner half darker and mottled.

*Hindwings* : with a black line at base, double black antemedian and postmedian lines, the latter lunulate-dentate ; no submarginal line, but a black cloud beyond cell ; marginal spots and fringe as in forewings ; cell-spot large and distinct.

Underside suffused with fuscous, paler in hindwings ; fringes and costa of forewings pale brown. Head, thorax, and abdomen like wings ; abdomen with black ring at base and pairs of black spots on dorsum ; face above and palpi externally brown-black.

Expanse of wings : 35 mm.

One ♂ from Popayan, Colombia (Lehmann).

192. *Stenalcidia venusta* sp. nov.

*Forewings* : silvery grey, finely striated with darker ; the costa with oblique dark marks ; lines velvety black ; first from one-third of costa, minutely biangulated in cell, then oblique, parallel to costa, to near base of inner margin ; second line from two-thirds of costa, at first oblique outwards, bluntly rounded between veins 6 and 4, then oblique and sinuous to before middle of inner margin, closely approximating to first line on submedian fold, towards which it throws out black spurs along the veins ; the whole inner margin, as far as the middle of cell, pale flesh-colour tinged with fulvous brown, this tint also forming beyond outer line a broad fascia running obliquely towards apex and filling up two or three lunules

which represent the submarginal line ; marginal area, except at middle, darker grey ; fringe silvery grey, beyond a fine dark marginal line ; cell-spot indistinct.

*Hindwings* : with waved antemedian and postmedian dark lines, the latter followed by a flesh-coloured fascia containing a tawny band.

Underside smoky fuscous, darker towards hindmargin, the hindwing paler. Head, thorax, and abdomen grey, much varied with flesh-colour and tawny ; face and palpi brown.

Expanse of wings : 28 mm.

One ♂ from Paramba, Ecuador (Rosenberg).

### 193. *Synecta duplicata* sp. nov.

*Forewings* : greyish white, the lines darker grey, thicker at costa ; first at one-fifth, curved and waved, geminate ; median before middle, strongly projecting in cell before the linear black cell-spot, and incurved below the median vein to inner margin near first line ; outer line at two-thirds, geminate, denticulate, outcurved above middle, strongly incurved below, touching base of cell-spot, to near middle of inner margin ; submarginal line pale, waved, between two grey shades formed of confluent lunules, the inner between the veins, the outer upon them ; large black marginal spots between the veins.

*Hindwings* : without first line ; the cell-spot large and immediately preceding the inner arm of the postmedian line ; fringe of both wings whitish.

Underside uniform dull grey, darker towards hindmargin ; cell-spots dark. Head, thorax, and abdomen pale grey.

Expanse of wings : 28 mm.

One ♀ from San José, Costa Rica (Underwood).

The two species which I have already described in this genus (Nov. Zool. IV. p. 473), *cuneifascia* and *griseola*, were represented by ♂♂ only ; in the present case the type is a ♀, having moderately pectinated antennae and the fovea of forewings almost as strongly developed as in the ♂♂.

The absence of yellow colouring on the body will distinguish it from *S. cuneifascia*, to which it otherwise bears considerable resemblance.

### SUBFAMILY FIDONIINAE.

### 194. *Fidonia marginata* sp. nov.

♀ *Forewings* : deep yellow, with a marginal border whose inner edge is curved from three-fourths of costa to anal angle, thickly dusted with fine olive-fuscons striae ; fringe iron-grey.

*Hindwings* : with a narrower border from apex to anal angle, of uniform width throughout, but narrowed to a point at anal angle, much darker than in the forewings, the yellow being all but obliterated ; fringe as in forewings.

♂ with only the inner edge of the border indicated in the forewings, the apex of both wings with a few grey scales.

Underside deeper yellow ; the marginal borders dark olive-fuscons, and complete in both wings and in both sexes. Head, thorax, abdomen, and legs all yellow ; forelegs tinged with fuscons ; antennae dark grey.

Expanse of wings ; ♂ 26 mm. ; ♀ 28 mm.

Five ♂♂, four ♀♀, from Ciudad Bolivar, Venezuela, October 1898 (Klages.).

**Mimocharis** gen. nov.

*Forewings* : with costa slightly curved ; apex rectangular ; hindmargin obliquely curved.

*Hindwings* : well rounded.

Palpi short, drooping ; antennae of ♂ subserrate and pubescent ; forehead somewhat prominent ; frenulum present ; no fovea ; hindlegs broken.

*Neuration* : forewings, cell half as long as wing ; discocellular vertical ; first median at two-thirds, second at seven-eighths ; radials normal ; 7, 8, 9, 10 stalked from some distance before end of cell ; 10 and 11 coincident, anastomosing and becoming coincident with 12 ; hindwings with costal approximating to subcostal for nearly half of cell ; veins 3 and 7 before angles of cell.

Type : *Mimocharis rosgala* Th. Mg. (*Heterusia*).

Allied to the European *Chiasmia*, but of very different aspect, mimicking *Heterusia*.

**Narragodes** gen. nov.

*Forewings* : broad, the costa in basal half well arched ; apex bluntly produced ; hindmargin sinuous ; inner margin convex.

*Hindwings* : with both angles and the hindmargin fully rounded.

Antennae of ♂ pectinated, the pectinations ciliated and rather far apart ; palpi quite short, porrect ; tongue very slight ; frenulum present ; hind-tibiae much thickened, with a pencil of hairs and four spurs.

*Neuration* : forewings, cell half as long as wing ; the margins inclined inwards towards the end ; first median at three-fourths, second at seven-eighths ; radials normal ; 7, 8, 9 stalked ; 10 and 11 coincident, anastomosing strongly with 12 ; hindwings with the costal anastomosing with subcostal for quite three-fourths of cell ; the subcostals from the upper angle ; no radial ; medians as in forewings.

Type : *Narragodes fuscata* sp. nov.

Differs from *Narraga* Wlk.—with which genus it agrees in the anomalous anastomosis of the costal and subcostal of the hindwings—in having short, broad wings instead of narrow, elongated ones ; in the absence of a fovea in forewings, and in the subcostals of hindwings not being stalked.

195. **Narragodes fuscata** sp. nov.

*Forewings* : dark brownish fuscous, rather coarsely scaled ; traces of two darker fascia, one median passing over the blackish cell-spot, the other postmedian and curved ; fringe fuscous.

*Hindwings* : the same, the fasciae both curved, parallel to hindmargin.

Underside much paler, greyish ochreous, with dense fuscous striae ; the fasciae plainer. Head, thorax, and abdomen concolorous.

Expanse of wings : 20 mm.

One ♂ from Sao Paulo, Brazil.

## SUBFAMILY SELIDOSEMINAE.

**Amblurodes** gen. nov.

*Forewings* : with costa straight, curved just before apex ; apex rectangular ; hindmargin crenulate, obliquely curved below.



*Hindwings* : with apex rectangular, hindmargin vertical and crenulate to below vein 6, then abruptly bent and straight to vein 2 ; inner marginal area largely developed, thickly fringed with hair, and produced into a curved lobe at anal angle, and with a fringed lobe at base ; beneath with a bed of hairs along submedian fold ; upper side clothed with hairlike scales, as in *Trichostichia* Warr.

Antennae three-quarters the length of forewings, slender, and finely serrulate ; palpi porrect, second joint hairy, third short and smooth ; tongue and frenulum present ; legs strongly developed ; hind-tibiae thickened, with a pencil of hair.

*Neuration* : forewings, cell more than half as long as wing ; discocellular oblique outwards ; first median nervule at two-thirds, second close before third ; lower radial from somewhat above the middle of discocellular ; veins 7, 8, 9 stalked ; 10 and 11 stalked ; 10 anastomosing with 8, 9 ; hindwings with vein 7 from before angle of cell ; the three median nervules short, the last two from angle of cell.

Type : *Amblurodes commixta* sp. nov.

#### 196. *Amblurodes commixta* sp. nov.

*Forewings* : dull greenish, covered and suffused, except towards the hindmargin, with dark olive-brown more or less confluent striae ; first line very obscure, from about one-sixth of costa to one-third of inner margin, externally dark-margined, forming three teeth outwards, one on subcostal vein, and one above and below the submedian vein ; an indistinct blackish antemedian line ; a dull greenish ochreous median line, bent below median vein, then vertical to inner margin, internally dark-edged ; a similarly pale slightly dentate line nearly touches it on inner margin ; submarginal line strongly dentate and much paler just at costa, preceded by a dense blackish shade forming oblong blotches between the veins ; the dark costal blotch is preceded by an oblique pale line, which is apparently the commencement of the line which approximates to central line on the inner margin ; hindmargin crenulate, with dark marginal spots between the veins ; fringe olive-brown.

*Hindwings* : dull dark smoky brown, the fringe paler.

Underside dull cinereous, darker towards base ; both wings with an ill-defined blackish central line and submarginal fascia ; the forewings with an abbreviated middle line from costa. Head and thorax dark olive-brown, with green scales intermixed ; abdomen paler, more greenish ; anal tuft dull ochreous.

Expanse of wings : 48 mm.

Three ♂♂ from Paramba, June 1897, dry season, 3500 ft. (Rosenberg).

Allied to *Amblurodes velledata* Moeschler (*Ischnopteryx*), from Surinam, but much darker, and without the inner pale straight line. Moeschler's description, however, was drawn from a single ♂ : and it is just possible that the pale inner line was not natural, but caused by abrasion in the setting.

#### *Callipseustes* gen. nov.

*Forewings* : costa gently curved, apex depressed, minutely produced ; hindmargin faintly elbowed at vein 4, vertical above, oblique below.

*Hindwings* : apex and hindmargin rounded ; anal angle square.

Antennae in ♂ simple, lamellate ; palpi porrect, very short ; tongue and frenulum present ; hind-tibiae of ♂ with four spurs, and thickened, with a pencil of hairs. Forewings with the submedian vein swollen at base and bent downwards, the wing membrane between it and median somewhat puckered and contorted.



*Neuration*: forewings, cell more than half as long as wing; discocellular vertical; first median nervule at one-half, second close before end; radials normal; 7, 8, 9 stalked from before end of cell; 10 and 11 stalked and osculating with 12.

Type: *C. parambicola* sp. nov.

197. *Callipseustes parambicola* sp. nov.

*Forewings*: glossy ochreous, striated finely with grey and suffused with rufous brown; basal and marginal areas pale, crossed by fine striations; central area dark blackish brown: its inner edge from before one-third of costa to near middle of inner margin, its outer from nearly two-thirds of costa to beyond middle of inner margin, wavy and bent at right angles on vein 4; twice as broad on costa as on inner margin; two or three waved and swollen lines beyond the fascia; a dentate fine white submarginal line from before apex, indicated in lower half of wing by dark blotches before margin; fringe brownish.

*Hindwings*: dark cloudy grey; a dark grey pale-edged slightly crenulate postmedian line, not reaching costa, and a rather large dark cell-spot.

Underside yellowish ochreous, thickly speckled and in forewings suffused with blackish grey; an outer curved line in both wings indicated by black vein-dots. Head, thorax, and antennae pale ochreous; abdomen wanting.

Expanse of wings: 27 mm.

One ♂ from Paramba, Ecuador, January to May 1897.

198. *Cidariophanes indentata* sp. nov.

*Forewings*: dull olive-green, thickly dusted and striated with fuscous and rufous; all the veins rufous; a small dark fuscous spot on median close to base, followed by a larger blotch between subcostal and submedian veins; inner edge of central fascia from one-third of costa to one-third of inner margin, black, inwardly edged with pale ochreous, forming two strongly rounded projections outwards above and below median; these two projections are filled up with olive-fuscous; outer edge black, externally margined with pale ochreous, from two-thirds of costa to three-fourths of inner margin, oblique outwards to vein 4, then incurved to submedian fold and again oblique outwards, dentate-lunulate, followed by dark patches between the veins; a dark sinuous central shade parallel to outer edge just beyond the dark cell-spot; submarginal line preceded by a rufous shade, and marked by three white spots below costa, interrupted in middle by an oblique rufous shade; a row of black marginal lunules between the veins; fringe dark olive-fuscous.

*Hindwings*: dull whitish; the inner and hindmargins much speckled with grey-brown; two black curved submarginal lines from above anal angle, the inner concise, the outer diffuse, and becoming cloudy towards costa; marginal line black; fringe fuscous.

Underside of forewings ochreous, striated and suffused with fuscous; inner margin whitish; a dark straight central streak, blackish cell-spot, and crenulate outer line; three pale subapical spots; a pale blotch below middle of hindmargin; hindwings speckled but not suffused with fuscous; a distinct thick fuscous ante-median line; the cell-spot, crenulate postmedian line, and cloudy submarginal shade fuscous. Thorax olive-fuscous and ochreous; face and vertex paler; abdomen ochreous, speckled with fuscous, the crests ochreous.

Expanse of wings : ♂ 41 mm. ; ♀ 48 mm.

One ♂, one ♀ from R. Tanampaya, Bolivia, 1894 (Garlepp).

The ♀ has the markings somewhat less distinct.

199. *Cidariophanes perrubescens* sp. nov.

*Forewings* : with the ground colour only slightly olive-tinged, being almost wholly suffused with dull flesh-colour, with much less dark mottling than in *indentata* and with the dark and light tints more contrasted ; the description of the markings given for that species applies entirely to the present species, with one exception ; in *indentata* the upper curve in the inner edge of the central fascia projects further outwards than the lower ; in *perrubescens* it does not thus project, and the pale space preceding the dark shade is broader and more oblique.

*Hindwings* : whiter, being without the dark dusting on inner marginal half ; the submarginal shade and fringe paler.

Underside altogether paler, a mixture of ochreous and olive-brown ; hindwings paler, more whitish, with less freckling ; the dusky antemedian line, which is plain in *indentata*, entirely absent. Head and thorax paler, ochreous speckled with blackish and dark olive-green.

Expanse of wings : 41 mm.

Two ♂♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

Altogether a brighter-looking species than *indentata*.

200. *Ischnopteris chryses*, ab. *dispar* nov.

Differs from *chryses* Druce, in that the ♂ has a large pure-white blotch, shaped like a flattened figure of 8 in the end of the cell, touching a whitish or pale spot on costa ; the costal portion of the submarginal line also is prominently white, and is preceded by a bluish white costal blotch ; the submarginal line is acutely dentate, not waved. The hindwings are smoky olive-fuscescent, becoming darker immediately before the yellow apical space.

The ♀ has the median space between the oblique basal and the toothed outer line wholly filled up with velvety black except along the costa, the black portion projecting also beyond the teeth of the outer line between veins 2 and 4 as far as the submarginal line ; the yellow apical portion of the hindwings is deeper than in the ♂. The underside agrees with the type.

Expanse of wings : ♂ 44 mm. ; ♀ 48 mm.

Two ♂♂, two ♀♀ from Paramba, Ecuador (Rosenberg).

It seems probable that the black central suffusion in the ♀♀ is not constant, as in a ♀ from Chimbo the whole wing is dull green, showing the three dark lines distinct ; in a ♂ from Chimbo the white discal blotch is much larger and rounder, and not connected with the costa.

*Lobopola* gen. nov.

*Forewings* : elongated ; costa slightly arched throughout ; apex blunt ; hindmargin obliquely curved ; inner margin somewhat convex.

*Hindwings* : with well rounded hindmargin.

Antennae of ♂ pectinated ; palpi obliquely porrect, reaching in front of face, the third joint small ; tongue and frenulum present ; hind-tibiae with 4 spurs.

The inner margin of hindwings possesses a lobe, reaching to half its length and folded over beneath.

*Neuration* : forewings, cell not quite half as long as wing; discocellular vertical; first median nervule at two-thirds, second just before end; radials normal; 7, 10, 8, 9 stalked; 11 and 12 free; hindwings with first subcostal and second median from before ends of cell.

Type : *Lobopola cimarrona* Dogn. (*Boarmia*?).

Allied to *Perissopteryx* Warr., but the lobe only half as long; vein 11 of forewings free, not anastomosing with 12; the lines and markings quite different.

#### 201. *Oenoptila venusta* sp. nov.

*Forewings* : deep brick-red with a yellowish undertone, covered with slender fuscous striae; the two lines broadish, dull yellow; first from one-fourth of costa to one-third of inner margin, faintly curved; second at three-fourths, slightly sinuous; the central included space rather deeper red, especially close to lines; fringe concolorous; cell-spot obscure.

*Hindwings* : with only the outer line.

Underside pale pinkish yellow, striated towards costa and apex, with traces of the second line. Head, thorax, and abdomen concolorous.

Expanse of wings : 36 mm.

One ♀ from Dominica, February 1897.

Like *Oe. nigrilineata* Warr. ab. *reversa*, from Jamaica, as far as regards the colour of the lines, but with the ground-colour red instead of dark red-brown.

#### 202. *Petelia fulva* sp. nov.

*Forewings* : pale reddish fulvous, thickly striated with fuscous; the lines dark vinous fuscous, thick and somewhat indistinct; first at one-fourth, bent in cell, then vertical; second, median, vertical, with a faint bend outward below middle; third at three-fourths, rather abruptly bent outwards at vein 4, then parallel to hindmargin; fringe concolorous; cell-spot black, small; the base and costa slightly darker than ground-colour.

*Hindwings* : the same, without first line.

Underside much paler, pinkish ochreous; the cell-spots large and distinct; the outer line obscurely marked. Face, palpi, vertex, and collar deep red; thorax and abdomen like wings, the abdomen deeper red along back.

Expanse of wings : 26 mm.

One ♂ from Florida, August and September 1895 (Pridley).

#### *Stegotheca* gen. nov.

*Forewings* : elongate, narrow; costa arched at base, then straight; apex rectangular; hindmargin vertical above, obliquely curved below.

*Hindwings* : broader than forewings; both angles rounded off; hindmargin with a blunt elbow at vein 2.

Abdomen of ♂ extending considerably beyond hindwings; antennae thick, lamellate, tongue and frenulum strongly developed; palpi and legs damaged.

Forewings with a large foveal space at base between subcostal and submedian veins, covered beneath by the large semi-oval chitinous retinaculum affixed to the costal vein.

*Neuration*: forewings, cell quite three-fifths of wing; discocellular slightly oblique, biconcave; first median nervule at two-thirds of cell, second near before third; lower radial from upper third of discocellular between its two concavities; upper from upper angle; veins 7, 8, 9, 10 stalked from considerably before end of cell; 11 still further backwards, becoming coincident with 12; hindwings with costal approximated to subcostal for about half of cell; vein 7 well before end of cell; first median at three-fourths; no radial.

Type: *Stegotheca amissa* sp. nov.

### 203. *Stegotheca amissa* sp. nov.

*Forewings*: dull ochreous, more or less covered with greenish fuscous scales; the markings indistinct; traces of a dark shade near base; a dark median line from middle of costa oblique outwards to vein 4, there bluntly rounded and inflected, and denticulate to inner margin at three-fifths, preceded by a darker fascia, the inner edge of which runs parallel to the line; submarginal line pale, preceded by a darker shade, marked beneath costa by horizontal dark streaks; space beyond central fascia pale on inner margin and tinged with ochreous; fringe concolorous.

*Hindwings*: dull fuscous grey.

Underside dingy grey; both wings with darker margin. Thorax and abdomen greenish grey.

Expanse of wings: 30 mm.

One ♂ from Cachabí, Ecuador, low country, November 1896 (Rosenberg).

The description above given is the best under the circumstances; the single example is considerably worn.

## SUBFAMILY SEMIOTHISINAE.

### 204. *Semiothisa combusta* sp. nov.

*Forewings*: dull whitish, suffused with rufous brown; lines sienna-brown; first close to base, second just before middle, thick and diffuse, both oblique outwards, angled in cell, then oblique inwards, the median preceded and followed towards inner margin by paler zigzag brown lines; outer line from two-thirds of costa, slightly crenulate and marked with dark brown spots on veins, to three-fourths of inner margin, outwardly edged irregularly with white, and then followed by a broad blotched sienna-brown fascia, the marginal area beyond it being varied with paler; three dark costal spots before apex with ochreous between them; marginal line and fringe dark brown; the subapical excision strong; space between veins 2 and 3 from their origin to fascia hyaline white.

*Hindwings*: wholly suffused with rufous brown except a pale marginal patch below the tooth; a brown line at base; a thick diffuse brown antemedian shade; a waved postmedian and slightly curved submarginal line both rufous; apical area darker; fringe dark brown; cell-spot obscure, brownish.

Underside yellow with all the markings deep rich brown; the discal triangle and apical blotch of forewings white.

Expanse of wings: 30 mm.

One ♂ from Azalar de Carthago, Costa Rica, 5000 to 6000 ft. (Underwood).



205. *Semiothisa ochrata* sp. nov.

*Forewings* : dingy brownish ochreous, dusted and striated with fuscous ; the lines fuscous, ill-defined ; first at one-fourth, curved ; second shortly beyond it, before the middle, thick and slightly sinuous, followed by a distinct black elongate cell-spot ; third line waved and subdentate, at three-fourths, curved from costa to vein 2 and bent in at the submedian fold, followed by a less distinct parallel line and shade, thickened into blotches between veins 6 and 7, 3 and 4, and above anal angle ; the whole marginal area rather darker ; fringe dingy ochreous, beyond an irregular dark basal line.

*Hindwings* : with no first line or outer shade ; cell-spot large, round, black.

Underside ochreous, washed with dull yellow and speckled with fuscous ; the cell-spots and a single outer line distinctly black. Thorax and abdomen like wings, but the abdomen tinged with yellow ; collar, vertex, and face dull ferruginous.

Expanse of wings : 29 mm.

One ♂ from Dominica, July 1897.

Forewings with the hindmargin faintly sinuous, without excision ; hindwings bluntly angled at middle.

206. *Semiothisa praelongata* sp. nov.

*Forewings* : greyish ochreous, with a slight lilac tinge and sparsely speckled with dark atoms ; the lines dull ferruginous, starting from thickened outwardly oblique blotches on costa, and marked with darker scales on the veins ; first at one-fifth, curved ; second before the middle, ill-defined, sinuous ; third at two-thirds, faintly sinuous ; fourth oblique, at three-fourths, diffusely edged with ferruginous below costa, and approximated to third below vein 6, with a large black lunule externally between veins 3 and 4 ; marginal area lilac-grey ; subapical incision margined with black ; slight black dots along the margin between the veins ; fringe concolorous, darker along the incision.

*Hindwings* : without first line or black lunule ; cell-spot dark, round.

Underside quite different ; yellow, densely speckled with tawny, and with white patches along cells and submedian folds ; cell-spots large and black ; the lines tawny ; a dark tawny band beyond fourth line, broader in the forewing, and above vein 4 reaching to the hindmargin, containing a white apical patch above and a triangular yellowish patch below. Head, thorax, and abdomen concolorous with wings ; forelegs much mottled with dark brown.

Expanse of wings : 32 mm.

One ♀ from Dominica, December 1897.

Distinguished by the narrow elongate wings ; a shallow, oblique, subapical excision from vein 7 to 4, the hindmargin below it very oblique ; hindmargin of hindwings crenulate, and acutely projecting in middle.

207. *Tephrinopsis rectilineata* sp. nov.

*Forewings* : pale sandy ochreous, with faint darker dusting ; the costa with fuscous striae ; the three lines straight and parallel, nearly vertical, pale or dark brown, at one-fourth, one-half, and three-fourths respectively, the last generally accompanied by a parallel shade of varying width forming a fascia ; a marginal shade with curved edge from below apex to anal angle ; marginal dots black ; fringe concolorous below, towards apex brownish ; cell-spot brown, very obscure.



*Hindwings* : with a straight brownish postmedian line or shade, often appearing lunulate ; marginal shade slight ; cell-spot brown.

Underside yellower, with the markings, especially the cell-spots, more distinct. Head, thorax, and abdomen concolorous.

Expanse of wings : ♂ 22 to 24 mm.; ♀ 24 to 28 mm.

A series including both sexes from Parana, Entre Rios, Argentina.

The two inner lines of forewings are often very slight or even obsolete ; on the other hand, in the darker and more strongly marked ♀♀, a central line is visible on the hindwings also.

#### SUBFAMILY ENNOMINAE.

##### 208. *Anisoperas impostor* sp. nov.

*Forewings* : ground colour fulvous-yellow, almost hidden by very fine and dense fuscous striae, the subcostal area and a small patch beyond cell remaining yellower ; lines fine, dark brown ; first from one-third of costa to one-third of inner margin, bent below costa, then straight and a little oblique to inner margin ; second from two-thirds of costa, sharply angled outwards on vein 7, then incurved, and from vein 5 straight and parallel to first line, to inner margin shortly beyond middle, marked externally by white dots on the veins ; in its costal portion it forms the margin of a subapical white blotch, which is notched outwardly and contains some dark scales ; from the outside of this blotch an obscurely denticulated submarginal line runs to before anal angle, the teeth darker, tipped with whitish scales ; cell-spot black, ringed with grey ; fringe concolorous.

*Hindwings* : the same, but without first line ; yellow spot beyond cell plain.

Underside dull testaceous, fuscous-speckled ; the lines indistinctly marked ; cell-spots plain. Face, palpi, and vertex dark fuscous ; fillet white ; thorax and abdomen concolorous with wings.

Expanse of wings : ♂ 35 mm.; ♀ 46 mm.

Four ♂♂, one ♀ from Paramba, Ecuador, March 1897, dry season, 3000 ft. (Rosenberg).

Distinguished from both *atropunctaria* Wlk., and *subfulvata* Warr., by the regular curvature of the second line, and the comparative distinctness of all the lines. The small yellow fulvous patch beyond the cell of both wings is characteristic.

##### 209. *Anisoperas rectilinea* sp. nov.

*Forewings* : mouse-colour, densely dusted with dark fuscous and hoary scales ; the costa striated blackish and white ; the lines blackish ; first at one-third, curved in middle, and marked by a dull yellow spot on median vein ; outer line straight or faintly curved, from two-thirds of inner margin to costa close before apex ; a denticulated submarginal line ; the veins towards margin somewhat darker ; fringe concolorous ; cell-spot very obscure.

*Hindwings* : like forewings, but without basal line.

Underside paler, without first line, and with traces of cell-spots. Head, thorax, and abdomen like wings.

Expanse of wings : ♂ 39 mm.; ♀ 41 mm.

A pair from Merida, Venezuela (Briceño).

The ♀ has traces of a darker median shade adjacent to the outer line.

210. *Apicia praeapicata* sp. nov.

*Forewings* : greyish ochreous, thickly dusted with small dark atoms ; the lines very fine and inconspicuous ; first curved, at one-fourth ; second just before middle of costa, below which it is curved, and passing over the black cell-spot runs obliquely, parallel to hindmargin, to middle of inner margin ; third from three-fourths of costa to two-thirds of inner margin, faintly lunulate between the veins ; marginal area beyond it darker, tinged with pale brown ; submarginal line waved, indistinct, but placed in a darker grey shade, the lunules opposite the cell filled up with dark and followed by a dark cloud to hindmargin ; marginal spots small, black ; fringe concolorous.

*Hindwings* : with a curved cloudy antemedian line in front of the black cell-spot ; a double strongly marked dark brown line from four-fifths of costa to four-fifths of inner margin ; marginal area dark grey.

Underside wholly pale greyish ochreous, speckled with fuscous ; a cloudy blackish submarginal fascia, entire and thickened beyond cell on forewings, reaching only to cell in the hindwings ; outer lines and cell-spots represented. Head, thorax, and abdomen concolorous with base of wings ; top of face and palpi brown.

Expanse of wings : 38 mm.

One ♂ from Petropolis, Brazil.

The hindmargin of hindwing is crenulated, the middle tooth prominent.

211. *Asestra albitumida* sp. nov.

*Forewings* : pale brownish ochreous, faintly speckled with darker ; first line at nearly one-third, angled on the subcostal vein, brownish fuscous with whitish scales intermixed, expanding on inner margin into an oblong white blotch, traversed by a faint dark line, which forms a black dot on the submedian vein ; outer line from costa at five-sixths, angled just below costa and again on vein 6, thence oblique inwards to three-fourths of inner margin, and marked only by dark vein-dots, expanding on inner margin into a similar blotch to the first line ; on the costa it is followed by a triangular white blotch, with its centre on the costa of the ground-colour ; marginal area rather deeper in tone than rest of wing ; fringe concolorous ; cell-spot round, rufous, rather large.

*Hindwings* : pale straw-colour, slightly speckled, with a curved submarginal series of dark dots on the veins.

Underside of both wings whitish ochreous, the forewings tinged towards costa and hindmargin with dull brownish, the lines indistinctly indicated. Head, thorax, and abdomen concolorous with forewings.

Expanse of wings : 30 mm.

One ♂ from Loja, Ecuador.

*Aterpnodes* gen. nov.

Allied to *Spiloeraspeda* and *Spododes*, but with the hindmargins of both wings entire and not crenulate. Palpi short, correct ; antennae of ♂ subdentate, shortly but densely pubescent ; hind-tibiae of ♂ thickened, with four approximate spurs, and a pencil of hairs. Forewings with a fovea.

*Neuration* : forewings, cell quite half as long as wing ; discocellular nearly vertical ; first median at one-half, second at seven-eighths ; radials normal :

7, 8, 9, 10 stalked ; 11 anastomosing strongly with 12, 10 with 11, and subsequently approximated to 8, 9 ; hindwings with costal shortly approximated to subcostal ; vein 7 well before angle of cell.

Type : *Aterpnodes geminipuncta* sp. nov.

212. *Aterpnodes geminipuncta* sp. nov.

*Forewings* : dull fawn-colour, speckled with black ; the costa blackish ; the lines very indistinct, denoted by small black vein-dots ; first at one-fourth ; outer line at seven-eighths ; subterminal represented only by two black lunules on veins 5 and 6 ; a row of minute black marginal dots ; fringe concolorous ; cell-spot black.

*Hindwings* : similar, but with no black lunules.

Underside paler ; the cell-spots and submarginal lunules distinct. Thorax and abdomen concolorous ; head and antennae brown.

Expanse of wings : 26 mm.

One ♂ from Azalar de Carthago, Costa Rica, 5000 to 6000 ft. (Underwood).

213. *Azelina dorsipunctata* sp. nov.

*Forewings* : grey-drab, finely speckled with black scales ; the two lines brown, fine, most distinct towards costa ; first from one-third of costa to one-third of inner margin, forming three outward curves, marked with a darker spot on median and submedian veins ; second from five-sixths of costa to two-thirds of inner margin, oblique and straight to vein 5, then forming a crenulated sinus inwards to vein 1, thence oblique to inner margin ; cell-spot hyaline white, 8-shaped ; between it and second line a tawny shade ; a slight tawny shade at apex, and four black submarginal dots ; fringe concolorous.

*Hindwings* : with costal area whitish ; a straight brown postmedian line, paler-edged outwardly ; two dark submarginal dots towards anal angle ; a small whitish cell-spot.

Underside paler, with coarser and darker freckles ; cell-spot of hindwings dark with a white centre ; outer line in both wings represented by black vein-dots ; some tawny and fuscous shades beyond outer line. Head, thorax, and abdomen like wings ; second and third segments of abdomen with a pair of large black spots, those on second segment wider apart than those on third.

Expanse of wings : 32 mm.

One ♂ from Palma Sola, Venezuela, 1896 (Whyman).

Forewings with a blunt tooth at veins 3 and 6 ; hindwings as in *gammaria* Moeschl., the apex rounded ; hindmargin straight to vein 3, which is prominently toothed, concave between 3 and 2, which is faintly toothed, then straight to anal angle.

214. *Azelina incompta* sp. nov.

*Forewings* : grey-brown, with a slight fulvous tinge in parts ; the central space deeper brown, containing a linear vertical white cell-mark ; lines rather darker ; the first at one-third nearly vertical, forming three uniform small curves ; outer line from three-fourths of costa to two-thirds of inner margin, irregularly waved, forming a rather more prominent sinus inwards between veins 4 and 2, marked by minute white dots on the veins, with a rather larger one at costa ; submarginal dots black and white ; two or three very obscure slightly darker clouds in the marginal area ; fringe concolorous.

*Hindwings* : brownish, fulvous-tinged towards anal angle ; a blackish postmedian line ending in a white spot on inner margin ; submarginal dots black.

Underside fawn-coloured, speckled with black ; inner half of forewings whitish ; outer line white and straight, starting from a white costal blotch ; costa ochreous marked with fuscous ; cell-mark as above ; some white scales before the two lowest submarginal dots ; hindwings with the postmedian line waved and dentate, black, edged with white ; anal area whitish and fulvous ; a distinct round black cell-spot with pale centre.

Head, thorax, and abdomen concolorous with ground-colour of wings.

Expanse of wings : 40 mm.

One ♂ from ten miles above Mapiri, Bolivia, 2000 ft., 1895 (Stuart).

Forewing with sharp tooth at vein 6 and a blunt one at vein 4.

## 215. *Azelina indistincta* sp. nov.

*Forewings* : dull purplish grey, the markings indistinct ; first line at one-third, forming three outward curves, that above the median the most prominent ; it is edged outwardly by a darker shade and inwardly towards the costa by a paler mark ; outer line from five-sixths of costa to five-sixths of inner margin, bulged beyond cell and more prominently on the submedian fold, incurved between, preceded by a broad dark shade with a fulvous reflection, which beyond the cell is developed into a more or less prominent bronzy yellowish blotch ; at the costa the line is followed by a pale sometimes whitish dash ; a narrow dark apical shade from costa just beyond this mark to middle of hindmargin, and two indistinct dark clouds towards anal angle ; small black white-tipped submarginal dots above vein 6 and on each side of vein 3 ; cell-mark angulated, narrow, subhyaline ; costa marked with alternate dark and pale striations ; fringe concolorous.

*Hindwings* : paler, brownish grey, tinged with fulvous towards anal angle ; a fine dark irregularly crenulated line from just above anal angle to four-fifths of costa.

Underside brownish cinereous, flecked with darker ; inner marginal half of forewings bluish white ; outer line dark brown, curved more or less parallel to hindmargin, followed by a small yellowish white spot on costa ; a smoky dark cloud along hindmargin ; cell-mark and submarginal dots as above ; hindwings darker throughout ; a large oval velvety black cell-spot ; outer line thicker, more crenulated than above, followed by a darker shade.

Head, thorax, and abdomen concolorous with wings ; anal tuft of ♂ whitish.

Expanse of wings : ♂ 38 mm. ; ♀ 36 mm.

Two ♂♂, one ♀ from Popayan, Colombia (Lehmann).

Forewings with the apex and a tooth at veins 3 and 6 slightly prominent (more so in ♀ than in ♂) ; the fringe minutely denticulate at each vein ; hindwings with the fringe similarly denticulate, the teeth at veins 2 and 3 more prominent, the margin between them excised.

## 216. *Azelina subochreata* sp. nov. and ab. *nocturna* nov.

*Forewings* : rufous fawn-colour ; first line at one-fourth of costa, oblique outwards and forming an inconspicuous projection above median, then oblique inwards parallel to hindmargin, inwardly faintly edged with paler scales ; outer line from three-fourths of costa to two-thirds of inner margin, nearly straight, slightly convex



between the veins below median, and bent in at inner margin, preceded by a deeper red-brown shade and followed by a fine dark line ; median area rather darker than the rest ; cell-spot hyaline white, bent in middle, and surrounded by a deeper tint ; marginal area darker like the fringes ; no submarginal spots.

*Hindwings* : darker, dull smoky brown, showing rufous only towards hindmargin ; an obscure darker line from before anal angle to before apex.

Underside bright rufous, speckled with grey ; inner marginal area of both wings and hindmargin of forewings grey ; discal mark of forewings more developed ; outer line of forewings double, the inner, representing the straight line above, faint ; the outer finely blackish and irregular ; this on hindwings becomes whitish and denticulate. Head, thorax, and abdomen like wings, but less rufous ; anal tuft pale.

Expanse of wings : 36 mm.

Two ♂♂ from Popayan, Colombia (Lehmann).

Between these two specimens there is as much difference in coloration as between the two forms of *Pergama melissa* Druce. In the second example, for which I propose the name of *ab. nocturna*, the ground colour is dull sombre grey, with the central fascia dark fuscous grey, almost blackish, without any rufous tint whatever ; and below the grey tints are much more predominant than in the typical form.

#### 217. *Azelina velutina* sp. nov.

*Forewings* : dull brownish grey speckled with black scales in the ♂, more pearly grey in the ♀ ; basal line somewhat indistinct, marked by black scales, from one-fifth of costa to one-fourth of inner margin, forming a blunt tooth in cell at about one-third of wing, and two less prominent below the median vein ; outer line sinuous from five-sixths of costa, convex above median, then concave, and again convex outwards, running sharply in to middle of inner margin, finely edged throughout with white, and preceded by a broad diffuse black-brown shade ; the space between the lines more or less suffused with fuscous brown, except the costal area, the median vein standing out pale brown ; cell-spot formed of two black dots placed obliquely one above the other, distinct in ♀, obscure in ♂ ; costa dotted with fuscous ; marginal area in ♀ beyond the white line first pearly grey with a darker line in the middle, then brownish ; in the ♂ wholly brownish ochreous ; black submarginal spots, the uppermost one tipped with white ; marginal line dark ; fringe grey with darker grey centre and fine ochreous basal line.

*Hindwings* : pale brownish grey in ♂, pearly grey in ♀ ; outer line paler, sinuous, shaped somewhat as in forewings, edged inwardly with a darker shade, especially above anal angle ; an indistinct submarginal cloud ; fringe as in forewings ; all the markings faint towards costa.

Underside cinereous, more brownish-tinged in the ♂, much speckled with dark scales ; outer line of forewings blackish, denticulate ; submarginal spots large and white ; no cell-spot ; hindwings with distinct crenulate blackish outer line edged with a paler more ochreous tint ; cell-spot small and annular ; a single white submarginal spot between veins 6 and 7. Head and thorax brownish grey or fuscous, like forewings ; abdomen like hindwings.

Expanse of wings : 35 mm.

Two ♂♂, two ♀♀ from Castro, Paraná (E. D. Jones), the ♀♀ dated March and November 1896, the ♂♂ August and October 1898.



Forewings strongly toothed at veins 3 and 6 ; hindwings with the teeth hardly marked ; the scaling above is smoother than usual in the genus.

218. *Cartellodes ochrea* sp. nov.

*Forewings* : glossy ochreous, faintly speckled with blackish ; a pale brown line, slightly sinuous, at three-fourths, angled on vein 6 and retracted to costa ; cell-spot brown ; fringe concolorous.

*Hindwings* : with the line straight, broader, at two-thirds.

Underside similar, with traces of an inner line on forewings, which probably in fresh specimens is visible on the upper side. Head, thorax, and abdomen concolorous.

Expanse of wings : 22 mm.

One ♀ from Paramba, Ecuador, April 1897, dry season, 3500 ft. (Rosenberg).

219. *Certima sericea* sp. nov.

*Forewings* : silky whitish, with a slight primrose tinge ; the markings quite pale brown ; a curved inner line, often obsolete, an oblique outer line, from three-fourths of costa to two-thirds of inner margin, and a finer submarginal line, which joins the outer line below middle ; a faint cell-spot.

*Hindwings* : with the oblique line central ; the submarginal as in forewings ; no inner line ; the cell-spot obscure.

Underside white ; the costa of forewings ochreous, with some ochreous speckles beneath it ; submarginal line indicated by a brown costal spot, and dots on the veins beneath it. Palpi dark fuscous ; antennae rufous ; head, thorax, and abdomen like wings.

Expanse of wings : 60 mm.

Two ♂♂ from Bogotá, December 1896 to March 1897 (Bürger).

The hindmargin of both wings is slightly bent at vein 4 ; the shoulders and patagia are elongated.

Very near "*Metrocampa sulphuraria*" Mssn., of which it may prove to be a form.

*Cnephora* gen. nov.

*Forewings* : with costa convex at base, slightly inflexed beyond middle ; apex minutely produced ; hindmargin toothed at veins 6 and 4, obliquely curved below.

*Hindwings* : with hindmargin curved, the apex rounded, the anal angle squared.

Palpi porrect, the second joint roughly scaled, the third blunt and smooth. Antennae lamellate, simple ; tongue and frenulum present ; hind-tibiae not thickened, with 4 spurs. Forewings at base with a depression between median and submedian veins. Patagia enlarged, reaching beyond the metathorax.

*Neuration* : forewings, cell quite half as long as wing ; discocellular vertical ; first median nervule at three-fourths, second at five-sixths ; third from end of cell ; radials normal ; 7, 8, 9 stalked ; vein 11 anastomosing for some distance with the costal ; 10 anastomosing with 11 and again with 8, 9. In the hindwings the first subcostal and second median both rise just before end of cell. Wings without markings.

Type : *Cnephora grisca* Mssn. (*Azelina*).

220. *Cratoptera vilaria* H.S., Auss. Schm. fig. 336.

*Cimicodes primularia* ♀ Druce, Biol. Centr. Am. Lep. Het. ii. p. 18.

*Cimicodes primularia* ♂ Druce, l.c., t. 42. f. 21. ab.

Herrich-Schaeffer's figure represents, as Guenée says, a pale yellow insect, with no markings but the oblique line. Druce's *primularia* ♀ must be identical with it. But his ♂, which is figured, having the double brown spots of the marginal area expressed, may be regarded as an aberration. Along with this form there comes, both from S. Paulo and from Bolivia, a further aberration, which I call *obscurata* ab. nov. from R. Tanampayo, Bolivia, in which the marginal areas of both wings and costa of forewings are suffused with dull reddish brown, the apical area of forewings however remaining yellow. All the examples of the two aberrations that I have seen are ♂♂; it is therefore probable, though by no means certain, that the typical paler forms are always ♀♀.

221. *Cyclomia alternata* sp. nov.

*Forewings*: deep dull red, with a diffuse black cell-spot; fringe red.

*Hindwings*: uniform deep yellow, the fringe reddish-tinged.

Underside dull yellow; the costa and marginal area of forewings, and outer half of hindwings reddish-tinged; fringe red. Head, thorax, and abdomen red.

Expanse of wings; 21 mm.

One ♀ from the Bahamas.

222. *Cyclomia bellula* sp. nov.

*Forewings*: yellowish white, covered with fine transverse purplish brown striae, and with the lines of the same tint; these are irregular in form, and shades rather than lines; first at one-fourth, broader on costa; second broad and diffuse, just before the middle, generally closely followed by a curved line which joins it below middle; an outer line at three-fourths, bent below costa, and a submarginal irregular shade, the two more or less united into a band; some dark purplish dashes between the veins along the margin; fringe yellow, flecked with dark at apex and anal angle, and with a broad dark blotch at the middle of margin.

*Hindwings*: with curved antemedian, postmedian, and submarginal brownish purple bands; a darker blotch at apex.

Underside similar, slightly less striated. Head, thorax, and abdomen yellowish speckled with dark.

Expanse of wings: 13 mm.

One ♂ from Carupano, December 1891 (C. W. Ellacombe).

Allied to *C. fulvamacula* from Chimbo.

223. *Cyclomia costipuncta* ab. *ocellata* nov.

Differs from *C. costipuncta* Warr., in the dark costal spot being obsolete, and the submarginal line being expanded into a slightly sinuous ochreous-fuscous band with irregular dark edges at costa and on inner margin; cell-spot a yellowish, dark-edged annulus.

*Hindwings* and underside as in the type.

Both wings are much speckled with dark on the upper surface.

One ♂ from Caicara, Orinoco, November 1898 (Cherrie).

Forms similar to this aberration have been received from Palma Sola and Cucuta, Venezuela, and from Chaco, Bolivia. They bear a strong resemblance to some of the forms of the very variable species *C. mopsaria* Guen. from S. Domingo and Porto Rico, but the dark marginal band of hindwings is more complete. For the present it seems best to keep the mainland forms distinct.

224. *Cyclomia fulvimacula* sp. nov.

*Forewings*: dull ochreous, thickly strigulated with dark brown; a dark brown curved inner and submarginal line; a thick dark brown central line, interrupted on the discocellular by an oblong deep orange patch, which is preceded by a dark brown blotch; an orange cloud beyond submarginal line below apex and at anal angle; fringe dark brown, preceded by a row of dark marginal spots.

*Hindwings*: yellower, with similar markings.

Underside the same, but less speckled; the oblong orange cell-blotches plain. Head, thorax, and abdomen ochreous, thickly speckled with blackish.

Expanse of wings: 16 mm.

One ♂ from Chimbo, Ecuador, July 1897, 1000 ft. (Rosenberg).

Much smaller than the different forms of *mopsaria* Guen.

225. *Cyclomia rubida* sp. nov.

*Forewings*: yellowish, entirely suffused with dull reddish, the red tint becoming much brighter along hindmargin; costa minutely dotted with darker, and with two deep red spots at one-half and three-fourths, denoting the origin of transverse lines, which are, however, hardly traceable; fringe deep red; no trace of ocellus or discal mark.

*Hindwings*: yellower, not suffused, but only sprinkled with bright red, and towards costa whitish; hindmargin only with a narrow red suffusion; central and submarginal interrupted red lines, not reaching costa.

Underside of both wings deep yellow speckled with red, most thickly towards hindmargin; inner margin of forewings whitish.

Head, thorax, and abdomen yellow tinged with red; antennae reddish, with the apical fourth externally white.

Expanse of wings: 27 mm.

One ♀ from Rio Janeiro.

226. *Eusarca multilinea* sp. nov.

*Forewings*: ochreous with a pink tinge and shaded with fuscous; costal area brownish-speckled, suffused with brown along the costal edge; the extreme apex whitish; a double oblique brown line from one-third of inner margin towards cell-spot, becoming obsolete above the median vein; a bigeminate brown line from middle of inner margin into apex, the innermost arm darkest and most distinct; two obscure grey submarginal lines disappearing in apex; a small black cell-spot; a distinct brown marginal line; fringe ochreous, with pale base; space between inner and outer lines paler than rest of wing.

*Hindwings*: without basal lines; with three central lines and two submarginal, these last broader and more distinct than in forewings; cell-spot between the first and second of the median lines.

Underside yellowish speckled with brown ; the lines indistinct, except the broad double one into apex of forewings, which is preceded by two brown spots.

Head, thorax, and abdomen ochreous, the vertex and shoulders paler.

Expanse of wings : ♂ 36 mm. ; ♀ 42 mm.

One ♂, one ♀, from Merida, Venezuela, November 1898 (Briceño).

Hindmargin of both wings bowed but not elbowed ; apex of forewings in ♀ more prominent ; tints of the ♀ paler than those of the ♂.

**227. *Eusarca subfasciata* ab. *crocea* nov.**

*Forewings* : pale yellow ; costa slightly dotted with brown ; a short oblique brown streak from costa before apex forms with a smaller brown spot beyond it a triangular blotch ; beyond the middle of the inner margin the commencement of an oblique rust-coloured line is faintly marked ; fringe pale yellow, tinged with brown, especially at apex.

*Hindwings* : with a faint brown line just before the middle ; fringe brown at apex.

Underside yellow ; forewings with a broad chestnut-brown marginal border obliquely cut off to apex ; hindwings with some brown scales at apex. Head brown ; thorax and abdomen yellow.

Expanse of wings : 30 mm.

One ♂ from Palma Sola, Venezuela.

An extremely pale and little-marked form of *E. subfasciata* Warr.

**228. *Eusarca umbrilineata* sp. nov.**

*Forewings* : fawn-colour, irrorated with fine dark atoms ; a black dot near base ; the lines purplish brown ; first fine, from one-fourth of costa, irregularly oblique outwards, angled in cell at one-third from base, then oblique to inner margin at one-third ; outer line from three-fifths of inner margin oblique towards apex, shortly before which it is bluntly angled and retracted to costa, accompanied on its inner edge by a broad shade which runs through to apex and edged outwardly by a faintly lustrous line, followed by a darker shade beneath apex and towards anal angle ; an oblique dark costal streak at middle above a small black cell-dot ; fringe fawn-colour.

*Hindwings* : with the purplish line and shade central ; the basal area paler, the marginal clouded with purplish grey ; traces of a curved dark line from three-fourths of costa, touching central line on inner margin.

Underside dull yellowish, with strong dark strigulations ; the lines and shades all distinctly expressed ; the apex broadly, the hindmargin more narrowly whitish grey. Head and thorax fawn-colour.

Expanse of wings : 35 to 39 mm.

One ♀ from Sao Paulo (type), and two ♀ ♀ from Castro, Parana, October 1897 (E. D. Jones). One of these is so thickly suffused with fuscous that the markings, except the oblique line, are almost hidden.

**229. *Euseneia rotundata* sp. nov.**

*Forewings* : chestnut-brown, deeper brown between the two lines ; first line obscure, from one-fifth of costa to one-fourth of inner margin, forming a prominent projection in cell above the median, then oblique inwards ; outer line black, slightly



concave outwards, and becoming double in lower half, from two-thirds of costa to two-thirds of inner margin ; marginal third paler, especially immediately beyond outer line, and striated with black ; fringe concolorous, a single white submarginal dot below vein 7 ; cell-spot small, oval, hyaline white.

*Hindwings* : duller, more suffused with fuscous, except along costa and inner margin ; traces of a dark, paler-edged line from above anal angle towards two-thirds of costa.

Underside bright chestnut-brown ; cell-spots round and white ; inner half of forewing whitish ; hindwing towards anal angle whitish, speckled with black. Head, thorax, and abdomen chestnut-brown.

Expanse of wings : 41 mm.

One ♂ from Merida, Venezuela (Briceño).

Hindmargin of both wings without any trace of teeth.

### 230. *Hasodima* (?) *incongruata* sp. nov.

*Forewings* : whitish grey, varied with ochreous grey transverse striae, the costal area suffused with grey ; the lines ochreous grey, indistinctly expressed, wavy ; first from one-fourth of costa to two-fifths of inner margin ; second from two-thirds of costa to three-fourths of inner margin ; submarginal from five-sixths of costa to five-sixths of inner margin ; a small dark cell-spot ; fringe whitish, with grey marginal spots.

*Hindwings* : white, slightly dusted with grey along inner and hindmargin and with traces of two transverse lines just above anal angle.

Underside white ; costa of forewings and costal end of submarginal line fuscous. Head and thorax grey ; abdomen whitish.

Expanse of wings : 39 mm.

Two ♂♂ from Bogotá (Child).

The hindwings are bent at the end of vein 3 as well as vein 7. It differs from typical *Hasodima* in having no crests to the abdomen.

An example marked *Macaria incongruata* Wlk. is in the British Museum Collection, but there is no trace of the description having ever been published under that name. That specimen was likewise from Bogotá.

### 231. *Herbita flavidiscata* sp. nov.

*Forewings* : fulvons brown, slightly tinged with lilac-grey towards the hindmargin ; the costal edge snow-white, speckled with fuscous ; five indistinct darker lines or shades, much as in *H. niebla* Dogn. ; the outer and submarginal denticulate, the teeth of the former marked with grey dashes on the veins ; cell-spot black, grey-edged, with a few slight fulvons orange scales round it, which also appear along the outer edge of the second line, and form a roundish blotch with irregular edges and paler centre beyond cell ; a large pale costal spot before apex, semicircular in shape, edged by a grey space, which on the costa towards base bears a snow-white spot ; the centre ochreous, tinged with grey ; the costal area marked with brown striae ; fringe dark brown.

*Hindwings* : similar ; the yellow cell-patch more obscure.

Underside pinkish ochreous grey, speckled with dark grey ; submarginal line



grey. Face and palpi brown-black ; vertex and antennal shaft white mixed with grey scales ; collar and thorax fulvous ; abdomen rufous-cinereous.

Expanse of wings : 56 mm.

One ♂ from Paramba, Ecuador.

### 232. *Ira subcostata* sp. nov.

*Forewings* : fawn-grey, slightly speckled with darker ; the costa finely marked with black and pale intervals ; a thick diffuse blackish shade from inner margin close to base, running beneath the subcostal vein to beyond middle, and thence extending to costa ; first line at one-fourth, outwardly curved between the veins ; median line straight and thick, from three-fifths of costa to three-fifths of inner margin ; a blackish semi-oval costal blotch before apex, marked by a strong white spot towards base ; from this spot a very obscure dark dentate-lunulate line runs obliquely inwards, touching median line on submedian fold, and ending in a dark spot on inner margin ; an indistinctly darker submarginal dentate-lunulate line ; fringe paler than ground-colour ; cell-spot dark, almost hidden by the median line and subcostal shade.

*Hindwings* : with dark cell-spot, curved median shade, and dentate-lunulate postmedian and submarginal darker lines.

Underside dull cinereous, speckled with darker, with an obscure cloudy submarginal fascia on both wings, and round black cell-spots. Head, thorax, and abdomen concolorous.

Expanse of wings : 52 mm.

Two ♂♂ from Paramba, Ecuador, June 1897, dry season, 3500 ft. (Rosenberg).

### 233. *Isochromodes dispar* sp. nov.

*Forewings* : pale brownish ochreous, dusted with darker ; the lines diffuse, pale brown, not much darker than the ground-colour ; first at one-fourth, vertically waved ; second at one-half, similarly waved and vertical, passing over the small dark cell-spot ; third at three-fourths, obscurely double, waved and vertical to middle, then incurved and joining median line on inner margin ; submarginal line marked only by some dark cloudy spots, one separate beyond cell, two or three more or less coalescent towards anal angle ; fringe whitish, chequered with sandy beyond veins.

*Hindwings* : with curved central and submarginal lines only, the margin beyond the latter clouded with greyish.

Underside whitish ochreous, speckled with brown along costa and towards base in the forewings, slightly speckled only along costa in hindwings ; a smoky black fascia, straight from below three-fourths of costa to anal angle in forewing ; from costa and curved in hindwing, narrower and nearer hindmargin ; a well-marked black lunulate marginal line ; cell-spots black. Head, thorax, and abdomen ochreous ; top of face and upper edge of palpi brownish.

Expanse of wings : 39 mm.

One ♀ from Paramba, Ecuador (Rosenberg).

Of Walker's *extimaria*, which I have made the type of the genus, I have seen ♂♂ only ; these are grey, not ochreous, in ground-colour, and have the markings, more especially on the underside, so very different, that I am not disposed to consider them the ♂♂ of the species here described. *Subulodes bermeja* of Dognin, which I have not seen, may possibly be the ♂ of *dispar*.

234. *Melinodes furva* sp. nov.

*Forewings*: sandy rufous, speckled with darker, the costa with fuscous striae; the lines fuscous, slender, but marked distinctly on the veins by black white-tipped dots; first at one-fourth, nearly vertical; outer line from four-fifths of costa to three-fourths of inner margin, oblique outwards to vein 6 and there angled outwards, angled inwards on vein 5, thence oblique outwards to vein 4, vertical to vein 3, strongly oblique inwards to vein 2 and thence vertical to inner margin; a dark discal mark; fringe concolorous; a slight dark apical shade.

*Hindwings*: similar, without first line.

Underside paler, more straw-colour; the lines thicker, dull fuscous, without dark dots. Head, thorax, and abdomen concolorous.

Expanse of wings: 28 mm.

Several of both sexes from Bogotá.

Allied to *M. bogotata* Snell. (*Epione*.)

235. *Microgonia apidania* ab. *caliginosa* nov.

*Forewings*: dull pale olive, striated with fuscous; this ground-colour, however, only appears over the apical area between the median shade and hindmargin as far as vein 4, all the rest of the wing being covered with smoky black, except a few pale scales along inner margin at base of the first, the median, and the submarginal lines, and narrowly along the hindmargin; the first line and median shade are deeper black, and the submarginal dark zigzag line rises from the black lower cloud through the pale-olive area towards apex; the fringe is olive throughout.

*Hindwings*: entirely covered with smoky black, with the central line still deeper; the fringe concolorous.

Underside smoky olive-fuscous, darker towards hindmargins; the central line black in both wings; the apical white spot distinct, preceded by the dull brown fascia, which scarcely reaches the middle of the wing. Head, thorax, and abdomen smoky black, like the wings; the vertex and antennae alone pale olive-green.

One ♂ from Palma Sola, Venezuela, 1896 (Whyman).

236. *Microgonia insolita* sp. nov.

*Forewings*: dark brown, with dense deeper brown striations; first line obscure, from one-third of costa to near middle of inner margin, slightly outcurved above and below the median vein; second line straight and oblique, from just beyond middle of inner margin towards apex, before which it is sharply deflected to costa; space between the two lines deep velvety brown, containing a small concisely marked oval cell-spot of whitish scales; fringe concolorous.

*Hindwings*: with the straight line slightly antemedian, the included basal area rather darker than the marginal; in the marginal area can be traced a darker outwardly dentate submarginal shade, the teeth being marked by pale dashes on the veins; fringe of abdominal border white.

Underside of forewings dark brown, becoming paler towards base, which is freckled with whitish; traces of oblique innulate postmedian and dentate submarginal lines; the space between them on costa slightly fulvous-tinged; costo-apical space greyish; cell-spot as above, but less concise. Underside of hindwings bluish white, dusted with dark scales; some brown striations along costa; a broad brown marginal border, dividing below middle into a narrow marginal shade and a

submarginal row of nebulous brown dentate spots on the veins ; cell-spot small, black ; fringe brown throughout. Abdomen dark cinereous-brown, the antepenultimate segments blackish ; anal tuft paler ; head and thorax greyer brown ; pectus and abdomen beneath dull bluish white ; legs broken, probably whitish.

Expanse of wings : 52 mm.

One ♂ from Popayan, Colombia (Lehmann).

Forewings with costa strongly convex before apex ; apex minutely and bluntly produced ; hindmargin straight. Hindwings bluntly肘ed in middle.

### 237. *Microxydia brunnea* sp. nov.

*Forewings* : reddish brown ; first line curved, from beyond one-third of costa to one-third of inner margin ; second line from beyond two-thirds of costa to two-thirds of inner margin, sharply angled outwards on vein 7, then curved inwards ; both lines sublustrous ; the space between them deeper brown ; a patch of dark and sublustrous scales at end of cell ; submarginal line sinuous, indicated by dark marks on the veins, most distinct towards anal angle ; fringe dark brown.

*Hindwings* : with the dark central fascia narrower.

Underside brighter, more fulvous brown, speckled with darker, with the central fascia indicated, but without lustrous lines ; a patch of lustrous scales at end of cell. Head, thorax, and abdomen all brown.

Expanse of wings : 18 mm.

One ♂ from Newcastle, Jamaica.

Costa of forewings slightly curved ; apex prominent ; hindmargin faintly sinuous, indented below apex and above anal angle. Hindwings with hindmargin nearly straight.

### 238. *Mixopsis* (?) *casta* sp. nov.

*Forewings* : pearly ochreous, thickly speckled with pale olive-brown, and over all dusted with deep black scales ; the costa shaded with olive, especially towards apex ; the lines fine, deep black, edged with pearly scales ; first from one-fourth of costa to one-third of inner margin, forming angles outwards above and below the median vein, and followed by an olive-brown shade ; second from before apex to two-thirds of inner margin, slightly flexuous, acutely angled at vein 7, and there joined by a fine dark streak from apex, preceded beneath costa by a brownish cloud with a wisp of whitish scales across the line ; cell-spot large, round, pearl-grey with a black edge ; a faint waved olive-brown submarginal line ; marginal spots reddish ; fringe rufous ochreous ; the basal area is most free from striae and speckles and therefore palest.

*Hindwings* : much paler, without olive-brown speckling, and with only few black scales ; a blackish cell-spot, a fine black straight postmedian line and faint olive-brown submarginal line.

Underside with costa of both wings tinged with olive-brown and slightly black-speckled ; both wings with cell-spot and outer line black ; the latter preceded in forewing by a black costal blotch, and in hindwing angled outwards below costa. Head, thorax, and abdomen ochreous, speckled with black ; palpi externally black-brown.

Expanse of wings : 43 mm.

One ♂ from La Merced, Chanchamayo, Peru.

Hindmargin of both wings uniformly curved, not angulated ; except in this respect, not differing from typical *Mixopsis*, in which it may be left for the present.

### 239. *Mixopsis pallidaria* sp. nov.

*Forewings* : pale flesh-colour, with some sparse black dusting ; first line fine, black-brown, from one-fourth of costa to beyond one-third of inner margin, forming an acute angle outwards in cell, and a blunter one on submedian fold ; closely preceded by an olive-green line, dentate inwards on the median and submedian veins, the included space lustrous, white at the costa ; outer line similarly constituted, from costa shortly before apex to two-thirds of inner margin, but the dark line followed by the green one, which is strongly dentate outwards on all the veins, most prominently on veins 7, 6, and 4, incurved from 7 to 4, closely approximated, from vein 5 to inner margin, to a slightly sinuous dark brown oblique line which runs from three-fourths of costa to beyond middle of inner margin ; the space between these lines deeper flesh-colour ; the green outer shade of the outer line is followed by a diffuse pearly white tint ; marginal area deep flesh-colour, above the angle along the hindmargin dull green ; fringe flesh-colour, with darker mottlings beyond veins above middle ; cell-spot distinct, round, black.

*Hindwings* : satiny white, slightly tinged with flesh-colour along hindmargin and with a few scattered black scales along inner margin ; cell-spot black ; traces of two black lines on inner margin at two-thirds, neither reaching midwing ; fringe from apex to vein 4 white, with dark marks beyond veins, below vein 4 flesh-coloured.

Underside satiny white, speckled with black ; the outer line on both wings black, marked by vein-spots, which in the forewings are connected ; forewings slightly washed with brown, and with a dark brown blotch on costa before second line, which becomes blackish beyond cell ; cell-spots large, black and distinct ; fringe of forewings flesh-coloured, with slight mottling in upper half ; of hindwings white with blackish mottling throughout. Head and thorax pale flesh-colour ; abdomen whiter.

Expanse of wings : 44 mm.

One ♂ from R. Tanampaya, Bolivia, 1894 (Garlepp).

### 240. *Nematocampa decolorata* sp. nov.

*Forewings* : pinkish cream-colour, speckled with pinkish brown ; the lines brown ; first at one-third, bent on the subcostal vein, then straight ; second from beyond two-thirds of costa to two-thirds of inner margin, slightly curved outwards, and dentate inwards on the veins, preceded closely by a more curved and finer median line, which joins it at inner margin ; discal mark long, crescent-shaped ; marginal area filled up with pale pinkish brown, except an irregular oval space before apex, which remains of the pale ground-colour and is traversed by the darker veins ; marginal line darker ; fringe brown.

*Hindwings* : with the costal area pale ; the marginal third pale pinkish brown, to the inner edge of which a fine curved postmedian line is contiguous ; cell-mark as on forewings.

Underside very similar. Head, thorax, and abdomen like wings.

Expanse of wings ; 28 mm.



One ♂ from Castro, Parana (E. D. Jones).

A neater and smoother-looking insect than its allies ; the hindwings with a distinct angle at middle of hindmargin.

**241. *Nepheloleuca absentimacula* sp. nov.**

*Forewings* : pale sulphur-yellow, with faint grey transverse strigae ; costa more whitish, with the striae fuscous ; lines faint, pale grey ; first from one-fourth of costa to one-third of inner margin, interrupted below costa ; outer line much interrupted and very faint, from costa before apex to near anal angle ; a short grey streak on inner margin at two-thirds ; cell-spot linear, brown ; fringe concolorous with wings.

*Hindwings* : whitish towards costa, and without first line ; cell-spot small, brown ; outer line grey, at four-fifths, parallel in the main to hindmargin, angled in middle, where there is a slight orange cloud ; a brown-black spot in the tail, which is blunt ; fringe deeper yellow, with a very fine basal line.

Underside paler, without striae ; a brown cell-spot in forewings, and a brown outer line in hindwings, the marginal space between tail and anal angle brown. Palpi whitish, tipped with brown ; face whitish with a brown bar above ; vertex whitish ; thorax and abdomen pale yellow.

Expanse of wings : 40 mm.

Two ♂♂ from Ciudad Bolivar, Venezuela, September 1898 (S. Klages).

**242. *Paragonia longidens* sp. nov.**

Very much like *P. occiduata*, Guen. and the paler-marked forms of *tasima* Cram., but differentiated at once by the structure of the ♂ antennae.

In *Paragonia* proper, these are serrate, the serrations pubescent, and with a single bristle on each side from each serration, the bristle being about twice as long as the serration ; in the present species the serrations have developed into distinct pectinations, laterally ciliated, and bearing a bristle from the apex, the bristle being barely as long as the pectination. The hindmargins of hindwings are crenulate, both above and below the angulation at middle. The ♂ example from Paramba has dull ochreous wings, thickly speckled and strigulated with fuscous, with four diffuse curved dark fuscous shades, basal, median, postmedian, and submarginal ; the basal and marginal areas more or less wholly fuscous ; the hindwings with three shades ; both wings with black cell-spot.

Underside duller and paler, with the marginal area in both wings beyond the exterior line darker.

Expanse of wings : ♂ 56 mm. ; ♀ 80 mm.

One ♂ from Chimbo, August 1897 (Rosenberg) (type) ; one ♀ from Paramba, Ecuador.

**243. *Paragonia planimargo* sp. nov.**

*Forewings* : ochreous fawn-colour, with fine fuscous dusting, the costal and outer marginal area greyer, with less of the ochreous tint ; lines very obscure, indicated by a slightly darker hue and by faint dots on the veins ; first at one-third ; median bent round the cell-spot ; outer line starting from a large oval bluish white subapical spot on costa to three-fourths of inner margin, bent vertically on submedian fold, and ending in a rather darker blotch ; submarginal, the plainest, near



hindmargin, with more distinct black vein-marks; fringe concolorous; cell-spot black; very concise, formed of erect scales.

*Hindwings*: with base and costa paler; markings, except submarginal line and the black cell-spot, hardly distinguishable.

Underside still paler: cell-spots very distinct; outer line marked by strong blackish vein-dots; submarginal obscure. Head and palpi dull brown; thorax and abdomen like wings.

Expanse of wings: 48 mm.

One ♂ from Cucuta, Venezuela.

This species agrees with *occiduata* Guen. in having the margin straight on each side of the angle in both wings; it is entirely without the yellow discal blotch and strongly expressed markings of that species. The antennae are of typical structure.

#### 244. *Pero muricolor* sp. nov.

*Forewings*: pale fawn-colour, suffused with darker; lines dark brown, simple; first from before one-third of costa to two-thirds of inner margin, faintly sinuous; second from three-fourths of costa to two-thirds of inner margin, slightly bent outwards in midwing, but otherwise straight, edged inwardly by a fuscous brown shade; all the space between the lines, except that above the subcostal vein, which remains of the paler ground-colour, dull rufous brown, becoming dark brown below the median vein; a small blackish cell-spot; marginal area shaded, like the basal, with darker fawn-colour, with a row of small inconspicuous submarginal black dots; fringe dark fawn.

*Hindwings*: paler, dull whitish ochreous, becoming more ochreous towards hindmargin, with a fine dark line from inner margin before anal angle, where it is slightly curved, to costa before apex; four black submarginal dots.

Underside dull greyish ochreous, with darker striae; inner marginal area in both wings paler; both wings with dark linear cell-spot, and fine dark outer line, which does not cross the paler inner area; fringe fawn-colour. Head, thorax, and abdomen all dull fawn.

Expanse of wings: 36 mm.

One ♂ from Popayan, Colombia (Lehmann).

Outer margin of both wings bent, hardly toothed at veins 3 and 6.

#### 245. *Perusia subustimaculata* sp. nov.

*Forewings*: pale yellowish ochreous, freckled with darker ochreous, especially towards the hindmargin; a faint dark cell-spot; fringe concolorous.

*Hindwings*: the same, without cell-spot.

Underside paler; forewings with a brown oblique subapical costal blotch. Head, thorax, and abdomen ochreous; shoulders and patagia yellower.

Expanse of wings: 26 mm.

One ♂ from Loja, Ecuador.

#### 246. *Polla quadrilineata* sp. nov.

*Forewings*: dull dark fawn-colour, with fine dark scattered striae; the lines dark brownish fuscous, all more or less parallel to hindmargin; first from one-fifth of costa to one-fifth of inner margin, strongly angled in cell; the fourth shortly before apex, straight to below vein 6, then curved and irregularly waved; between these

two lines the costal area is pale ochreous, widest beyond middle where it reaches below vein 6, and tapering to a point at each end; the second and third lines rise from its lower edge, at even distances from each other and from the outside two; the ochreous costal area is thickly dusted with fuscous, and from the middle of costa contains an oblique dark brown blotch; fringe concolorous; apex of wing dark.

*Hindwings*: with the first two lines continued across them, first close to base, second at one-fourth; basal area pale, with dark speckles; the rest of the wing dark as the forewings; a large round yellow cell-spot, with darker yellow centre.

Underside dull pale grey, with the margins clouded with darker. Head and thorax like wings; abdomen wanting; fillet narrowly white.

Expanse of wings: 35 mm.

One ♀ from Cachabí, Ecuador, low country, December 1896 (Rosenberg).

#### 247. *Prochoerodes cubitata* sp. nov.

*Forewings*: fawn-colour, towards the hindmargin flushed with redder fawn, with slight black dusting and obscure striae; the basal area also slightly redder-tinged than the central; lines obscure, hardly darker than ground-colour, but marked by white dashes on veins; first curved, at one-fourth; outer line double, oblique and slightly curved, from middle of inner margin to costa just before apex; the reddish tint beyond the line runs actually to the apex, giving the appearance of the line itself so running, but the white dash nearest the costa is placed before the apex; a darker rufous cloud from anal angle runs into the marginal cloud; cell-spot small, black, distinct, of raised scales; fringe rufous fawn-colour, the tips towards anal angle shining whitish.

*Hindwings*: with the double line slightly antemedian and straight, just beyond the black cell-spot; an obscure and irregular dentate submarginal shade; extreme hindmargin from apex to angle at middle lilac-grey; fringe as in forewings.

Underside pale greyish fawn, much speckled with black, with slight rufous suffusion beyond the double line, which is however not expressed, and a deeper suffusion at margin in middle; apex of forewings white; cell-spots distinct; fringe as above. Face and palpi fuscous brown; vertex pale grey; thorax and abdomen like wings.

Expanse of wings: 48 mm.

One ♀ from British Guiana.

Nearest to *P. incaudata* Gnen., but the hindwings have a distinctly produced blunt tail, without pale scaling; forewings bluntly angled at vein 4, the apex minutely produced.

#### 248. *Spilocraspeda plana* sp. nov.

*Forewings*: drab, thickly dusted with black scales; first line curved, at one-third, indistinct, except above inner margin, and marked by vein-dots; second line also marked only by vein-dots, lying in a straight line from costa shortly before apex to inner margin at three-fourths; fringe concolorous, with small dark spots at the ends of the veins; cell-spot black.

*Hindwings*: the same; the outer line curved, and the dots indistinct.

Underside much paler, with the dusting and cell-spots black. Head, thorax, and abdomen drab, mixed with fuscous scales.

Expanse of wings : 28 mm.

One ♂ from Bogotá (Child.).

Very much like *Sp. nigripunctata* Warr. from Mapiri, but less distinctly marked, and the course of the lines different.

#### 249. *Spilocraspeda* (?) *rufigrisea* sp. nov.

*Forewings* : ashy grey, speckled and much suffused with dull reddish ; a crenulated red line at one-fourth ; a broad reddish central fascia, its inner edge diffuse, its outer crenulate and distinct, margined with paler grey, from four-fifths of costa to three-fourths of inner margin, incurved beyond cell and projecting strongly below the middle ; a reddish apical patch, internally edged by the wavy grey submarginal line, and another at anal angle touching the projection of central fascia ; a small black cell-dot ; marginal line very fine, with minute black dots at the ends of the veins ; fringe grey.

*Hindwings* : similar.

Underside of forewings cinereous, becoming blackish towards hindmargin ; cell-spot and outer line dark ; apex white with a few dark specks ; fringe whitish ; hindwings paler. Palpi and face reddish ; thorax grey ; abdomen wanting.

Expanse of wings : 28 mm.

One ♀ from Paramba, Ecuador, April 1897, dry season, 3500 ft. (Rosenberg).

#### 250. *Tetracis rufa* sp. nov.

*Forewings* : greyish brown, rufous-tinged, the greyer tint predominating along costa and beyond the outer line ; with numerous dark atoms and striae, especially in the ♀ ; an obscure darker curved line at one-third ; outer line rufous edged with shining pinkish white, slightly bent, from apex to three-fifths of inner margin ; cell-spot blackish ; fringe rufous.

*Hindwings* : pinkish grey, darker along hindmargin ; in the ♀ much speckled with fuscous ; a small dark cell-spot ; fringe rufous.

Underside dull grey, with a darker outer line in both wings. Head, thorax, and abdomen like wings.

Expanse of wings : ♂ 37 mm. ; ♀ 40 mm.

Two ♂♂, one ♀, from Sao Paulo.

#### 251. *Urepione conscripta* sp. nov.

*Forewings* : pale ochreous, almost wholly suffused with greyish fuscous and speckled with darker, a large patch at the anal angle only remaining pale ; the lines fuscous and olive-brown ; both angled below costa then oblique inwards ; first at quite one-third, second at three-fourths, to two-fifths and three-fourths of inner margin respectively ; the outer expanded on inner margin into an olive blotch with blackish scales intermixed ; midway between the two lines a brown median shade, parallel ; submarginal line irregularly bent and angled to anal angle ; a black submarginal dot on each side of vein 3 ; fringe concolorous ; cell-spot minute.

*Hindwings* : ochreous, without suffusion, but speckled and mottled with pale brown ; a black cell-spot on a brownish central shade ; a brownish submarginal line

from before apex into anal angle, preceded by a fine line forming two arcs, the apex touching submarginal line below vein 4.

Underside with both light and dark tints much brighter; the inner half of forewing more or less ochreous. Head, thorax, and abdomen ochreous; face and palpi brown.

Expanse of wings : 26 mm.

One ♂ from Palma Sola, Venezuela, 1896 (Whyman).

Forewings with hindmargin bent at vein 4, vertical above, oblique below; hindwings with an angle at vein 4, the hindmargin rounded above, straight below to anal angle. The same size as *Urepione tessellata* Wlk. (*Hyperetis*).

*Note.*—In NOVITATES ZOOLOGICAE, Vol. II. p. 82, I described a supposed new South American moth as *Adelotypa xanthobrunnea*, referring the genus erected for it, not without hesitation, to the *Orthostixinae*. The specimen was found in a box of South American *Geometridae*; and I was not at the time aware of the close resemblance between certain South American *Rhopalocera*, in neuration as well as superficial appearance, to some of the *Geometridae*, so that it never occurred to me that I had to do with a species of *Rhopalocera*. Had the antennae been entire, this fact would, of course, have been evident at once; but being both broken off short, I was induced to describe them as filiform. The insect is really a specimen of *Limonias bolena* Butler. I have to thank Mr. Schaus for calling my attention to the mistake.

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THE BIRDS OF BURU,  
BEING A LIST OF COLLECTIONS MADE ON THAT ISLAND BY  
MESSRS. WILLIAM DOHERTY AND DUMAS.

By ERNST HARTERT.

[Plate IV.]

IN March 1897 our friend Doherty collected near the well-known port of Kayeli, which used to be Mr. Wallace's hunting grounds, and later on that of Bruijn's collectors. Doherty's collection did not therefore contain any novelties; but many species peculiar to Buru were represented in large series and different stages of plumage, and he obtained one *male* of the very rare *Monarcha buruensis* A. B. Meyer. About eighteen months later Mr. Dumas, the former companion and skinner of the late Alfred Everett, visited Buru by order of Mr. Everett, and with the special instruction to collect at high elevations. He reached Mount Mada, where he was busy at an elevation of about 3000 ft.; and, though a still higher ground should have been collected over, and though it is evident that Everett's supervision was absent (new birds being obtained in single immature specimens only), he did very well, as he sent a large collection of very well prepared skins from Kayeli and Mount Mada, with a surprising number of new forms. The principal interest attached to these forms is the relationship of many of them to Malayan forms, which were never before known to enter the Moluccan area. It will be of the utmost interest to learn whether other Moluccan islands have a similar mountain fauna with Western (Indo-Malayan) elements to the same extent as Buru, and it must not be supposed that the last bird is already discovered on Buru. For such special zoogeographical interest compare *Prioniturus mada* (of Celebesian affinity), *Microeca addita*, *Erythromyias buruensis*, *Phyllergates everetti dumasi* (of Sundanese affinities), *Androphilus disturbans*, *Acanthopneuste everetti*, and *Geocichla dumasi*.

1. *Astur pallidiceps* Salvad.

(Cf. *Orn. Pap.* I. p. 64.)

One young *male* was procured by Doherty at Kayeli in March 1897. "Its iris was pale brown, feet orange-ochreous, claws black, bill black, cere and bare skin round the eyes orange-ochreous."

2. *Accipiter ceramensis* (Schleg.).

One fine adult *female* was obtained by Dumas on Mount Mada, at about 3000 ft. above the sea. This is the bird called *Accipiter rubricollis* by Sharpe (*Cat. B. I.*) and Salvadori (*Orn. Pap.* I.); but Schlegel's name, *Nisus cirrhocephalus ceramensis* (*Mus. P. B. Astures*, p. 39, 1862), has priority. Sharpe repeats in his new *Hand-List*, I. p. 253, the former mistake that the species (or subspecies?) occurs in Buru and Morotai, while it should be Ceram and Buru, the species inhabiting the Northern Moluccas (Batjan, Halmahera, and Morty) being *erythrauchen* (cf. Salvadori, *Orn. Pap.* I. pp. 68, 69).



3. *Baza subcristata reinwardti* (Müll. & Schleg.).

Two males, Kayeli, Buru (cf. *antea*, p. 20).

4. *Ninox hantu* (Wall.).

♂ ♀. Doherty collection, Kayeli, March 1897.

The relations of *N. hantu* require consideration, but I am not able at present to work them out.

5. *Pisorhina magica* (S. Müll.).

♂ juv., Kayeli, Doherty collection ; ♂ ad. Mount Mada, Dumas collection.

With this bird we have again reached a most vexed and difficult crux of systematic ornithology, which has been treated differently by almost every author. Sharpe (*Cat. B. Brit. Mus.* II. pp. 69—75) has separated *Scops magicus magicus* (Ceram, Amboina), *S. magicus leucospilus* (Batjan, Gilolo), *S. magicus bouruensis* (Buru), *S. magicus morotensis* (Morty), and others, which I will not mention, as they are probably quite distinct specifically. Schlegel united all these forms. Salvadori (*Orn. Pap.* I.) recognised *S. magicus* (Amboina, Ceram (?), Aru), *S. leucospilus* (Batjan, Halmahera, and Buru), and *S. morotensis* (Morty, Ternate).

Meyer and Wigglesworth (*B. Celebes* I.) mention *magicus* (Amboina, Ceram), *leucospilus* (Batjan, Halmahera, Ternate, Buru), and *morotensis* (Morty, Ternate), all as subspecies of *manadensis*. Quite recently we have a most painstaking article on *Scops magicus* and its allies by Dr. Finsch. He (*Nat. Leyden Mus.* xx. p. 163) unites *magicus*, *bouruensis*, *leucospilus*, and *morotensis*, and gives the following distribution : Amboina, Ceram, Buru, North Celebes, Batjan, Ternate, Halmahera, Morotai, Aru, Sumbawa. There are fifty-four examples in Leyden, in different reddish and brown phases. Sharpe, Schlegel, and Finsch have in any case shown landable consistency ; the former in splitting them up to the bitter end, the latter in uniting them all. Salvadori's (and Meyer and Wigglesworth's, after Salvadori's) view can hardly be correct, as he evidently went by the different phases of coloration and by the markings, which are very variable, and constructs a distribution which is difficult to believe in, allowing *leucospilus* to spread over the Northern and Southern Moluccas (Buru), and *morotensis* over Morty and Ternate, but not over Halmahera, where, between the two strongholds of *morotensis*, the allied *leucospilus* is to occur ! In view of the close relationship of these forms, which must be admitted by every one, such a distribution is not probable ; it is possible if these forms are all "good species," while it can **not** be accepted if Meyer and Wigglesworth's view of their subspecific value is taken.

As far as my conception of these owls goes, the case is as follows :—

The specimens from the Southern Moluccas—namely, from Amboina, Ceram, and Buru—are absolutely identical in a specific as well as subspecific sense. Those from the Northern Moluccas—namely, Batjan, Halmahera, and **probably** also Morty—are identical *inter se* ; but it seems to me that the northern form might be separable subspecifically as a smaller race from typical *magicus* from the South Moluccas.

For the latter (*magicus*) I obtain the following measures of the wing : 167 (Sharpe), 177 (Sharpe), 185, 186, 188, 190 mm. ; for the smaller northern form : 157 (Sharpe), 172, 175, 178. Finsch gives for the latter 162—191, for the former 173—192 mm. My measurements and Dr. Sharpe's show a striking difference between the northern and southern forms, while Finsch's exhibit only a very small

average in the same direction. The question of their subspecific value is therefore still open to doubt, but I believe at present in a smaller northern race.

The Morty form is very likely inseparable from the small northern one, but it is remarkable that the few specimens (we have also one in Tring) known from there are all very reddish brown. This is probably merely the rufous phase; in any case we cannot assume, without further evidence, that all Morty specimens are similarly rufous.

I am not prepared to accept the localities Aru and Sumbawa for *Scops magicus* without hesitation. From Sumbawa I have before me typical *Scops manadensis albiventris*, and not *magicus*; and it is difficult to believe that Aru has typical *magicus*.

## 6. *Strix cayelii*, sp. nov.

One *female* of a most beautiful *Strix* from Kayeli, October 1898, closely resembles the golden-yellowish form of *Strix novaehollandiae*, of which it is probably a subspecies, but has a more blackish ground-colour above, and the beautiful white mottlings are replaced by brownish ones, except on the middle and greater wing-coverts. The dimensions are smaller, but the longest remiges in both wings not being fully grown, exact measurements cannot be given. Tail 120 mm.

Although I have only one specimen of this owl, and the differences are slight, I cannot suppose that it is the same as *Strix novaehollandiae*. I believe, however, that many more forms of *Strix* will yet be found in the Eastern Archipelago.

## 7. *Eos bornea cyanonotus* (Vieill.).

*Eos rubra* var., Wallace, *Proc. Zool. Soc.* 1863, p. 21.

*Eos rubra* (partim) anctorum.

The Burn examples of the red lory differ so conspicuously from the typical form of Amboina and Ceram, that most ornithologists would separate them specifically. I prefer to treat them as a representative subspecies. Examples from Amboina, etc. are larger, and the body-plumage is uniform above and below and of a much lighter and brighter scarlet-red, lighter on the head. Those from Burn are very much smaller and the red is darker and more crimson. At present I am not able to make any further subdivisions, but it seems that examples from the Key Islands are generally larger; in other respects, however, they are perfectly similar to those from the islands of Amboina and Ceram. Probably those from Burn (*cyanonotus*) have lighter and more yellow bills, but unfortunately neither Doherty nor Dumas took the trouble to mention the colour of the beak on the labels, while we have fourteen from other localities with the colour of the bill described on the labels.

I have chosen the name *cyanonotus* (Vieillot in *Nouv. Dict.* xxv. p. 334) which is based on Levaillant's figure of the "Lori à franges bleues" on planche 93 of his "Perroquets." This figure is of the small size and the dark, almost crimson, red of the Burn birds, very much in contradiction to his light red "Perruche scarlate," which we take to be the typical form. These are the wing-measurements of the series now in the Rothschild Museum:—

*Eos bornea bornea.*

♂.	Wallace, Amboina (dealer's label) .	wing	152 mm.
	No locality, but probably Amboina. .	"	160 "
	Ceram (in A. B. Meyer's handwriting) .	"	167 "
	Amboina (in W. Blasius' handwriting) .	"	157 "
♂. ad.	Amboina 25.5.82 (H. O. Forbes coll.)	"	nearly 170 mm., but not fully grown.
♂	Monawalka 13.11.99 (H. Kühn coll.)	"	169 mm.
♀	" " " " "	"	158 "
♂	" 10.11.99 " " "	"	168 "
♀	" " " " "	"	160 "
♂	Teoor Isl. 1.6.99 " " "	"	157 "
♀	" " 11.99 " " "	"	162 "
♀	" " " " "	"	152 "
♀	" " " " "	"	158 "
♂	" " " " "	"	162 "
♀	" " " " "	"	157 "
♂	Jeniai, Taam Is. 11.99 " " "	"	173 "
♀	" " " " "	"	170 "
♂	Tnal, Key Is., 11.5.98 " " "	"	172 "
♂	" " " 1.5.98 " " "	"	167 "
♀	" " " 2.5.98 " " "	"	172 "
♂	" " " 12.5.98 " " "	"	174 "
♂	" " " 11.5.98 " " "	"	172 "
♀	" " " 12.5.98 " " "	"	167 "

*Eos bornea cyanonotus.*

♂	Mt. Mada, Burn, 3000 ft. (Dumas coll.).	wing	146 mm.
♀	" " " " " " " " " " "	"	146 "
♂	Kayeli, Burn (Doherty coll.) . . .	"	155 "
♂	" " " " " " " " " " "	"	155 "
♀	" " " " " " " " " " "	"	151 "
♂	" " " " " " " " " " "	"	152 "

8. *Trichoglossus cyanogrammus* Wagl.

Kayeli, Burn, Doherty and Dumas coll.

The distribution of this parrot is remarkable. It seems to extend without local variation over the Southern Moluccas to New Guinea and the Western Papuan Islands, but to be absent from the Northern Moluccas.

9. *Hypocharmosyna placentis* (Temm.).

No specimens received from Burn, but a Mr. P. T. Makatita presented a pair to Mr. Doherty, which he said were from the little island of Amblan (or Amblaw), south of Burn. They fully agree with specimens from other localities.

10. *Eclectus cardinalis* (Bodd.).

♂ ♀ from Kayeli sent by Doherty, *males* only from Kayeli by Dumas.

11. *Tanygnathus affinis* Wall.

Two ♂, one ♀ from Kayeli, Dumas coll.

We have not received *Tanygnathus gramineus*, which is evidently a rare bird. *T. affinis* is a representative of *T. megalorhynchus*.

12. *Geoffroyus rhodops* (Gray).

From Kayeli and Mount Mada, at about 3000 ft. The young *male* has a green crown, but it passes by moult into the lilac-blue crown through a brown-headed stage, like its close allies *Ge. personatus*, *floresianus*, *sumbaensis* and probably all the rest.

13. *Aprosmictus amboinensis buruensis* Salvad.

It seems that this form is not distinguishable from *A. amboinensis amboinensis* except by the entirely black bill. The interscapular region is entirely blue in adult *males* and apparently in *females* also, those with the interscapular region more or less green being younger individuals. Doherty obtained this parrot near Kayeli; Dumas on Mount Mada, about 3000 ft. high. In November they moulted on the coast.

14. *Prioniturus mada* sp. nov.

One immature *male*, Mount Mada, 3000 ft., Dumas coll. "Iris olive."

Green, feathers of nape with greyish blue edges, interscapulum mixed with bluish grey, lower back greyish blue, feathers of rump bordered with greyish blue. Lesser upper wing-coverts and broad line on inner bend of wing to below the scapulars of a somewhat ashy blue, a little darker than "campanula-blue" of Pl. ix. fig 11 in Ridgway's *Nomencl. of Colour*. Under-surface of a much lighter green, sides of chest darker and washed with blue; under wing-coverts washed with blue near the margin; longer under tail-coverts bright yellow, not yellowish green. Wing 175, tail (the elongated central rectrices *not* measured, as they are not fully developed) 97, bill from gape 22 mm., tarsus 15.

It is a pity that we have no adult *male*, but the differences from the Celebes species (*P. platurus*), which is the nearest ally, are so evident and striking, that I could not leave the Buru bird undescribed. According to Schlegel (*Mus. P. B. III., Psittaci, Revue*, p. 22) the Leyden Museum possesses a young *female* killed by Hoedt on Nov. 8th, 1864, in the bay of Bara on the north-western coast of Buru. The accuracy of this statement has been doubted (cf. *Salvadori, Cat. B. Brit. Mus.*, XX. p. 416), but we can now believe it. Most likely the young *female* differs so little from the same stage of *P. platurus*, that the differences were not noticed.

15. *Eudynamis orientalis* (L.).

The bird to which this name is generally applied is by no means rare in Buru, though we only got it from Kayeli and not from Mt. Mada.

**The first plumage of the young of *E. orientalis* is rusty buff above and below**, and it is similar in the young of *E. cyanocephala* and allies, while it is **black** in *E. honorata malayana* and evidently in all its allies. The foster-parents of *E. orientalis* are unfortunately not known. (Cf. Nov. Zool. 1898, pp. 461, 472.)



A study of the material of the genus *Eudynamis* has now shown me that I was wrong in identifying the birds from Alor and Sumba (Nov. Zool. 1898, pp. 461, 472) with *E. orientalis*. These birds are a form of *E. cyanocephala*, and are united with the latter in the *Cat. B. Brit. Mus.* XIX. p. 324. This, however, is not quite exact, as they are so much smaller that they cannot be united with the large Australian race. As far as I can make out the smaller race has no name. The smaller race has the wing of the *males* 200 to 210 mm., the larger has it 220 to 222 mm. long, and there are similar differences of dimensions of the tail, bill and feet, and also in the *females*. The large race inhabits Australia, the typical small race, which I call

***Eudynamis cyanocephala everetti* subsp. nov.**

in memory of our late friend Alfred Everett, who obtained it in Alor and Sumba (type Sumba!) inhabits Alor, Sumba, Timor, the Key Islands and small islands to the north of it, and evidently parts of New Guinea and other islands, though the New Guinea specimens require a most careful study.

Owing to the resemblance of the adult *males* of *Eudynamis*, which are all black, and the different stages through which the young birds pass, as well as to the want of well-dated, well-sexed individuals, and last not least to all biological observations, which would here be of particular value, the genus *Eudynamis* is not easily understood, and even the two most important works on the same, namely Salvadori's excellent memoir in the immortal *Ornitologia Papuasie*, I. pp. 359 to 370 and Shelley's article in *Cat. B. Brit. Mus.* XIX. pp. 315 to 328 are not sufficient and not quite satisfactory.

An examination of the material at present available in the Tring Museum leads me to the following results, which, however, may require considerable additions, and even alterations, when a richer material is worked out at leisure.

***Eudynamis honorata honorata* (L.).**

♂ ad. wing about 187 to 197 mm.; crown of ♀ ad. with buff shaft-stripes; first plumage of young blackish. India to China.

***Eudynamis honorata malayana* (Cab.).**

♂ ad. wing about 198 to 220 mm.; crown of ♀ ad. with buff shaft-stripes; first plumage of young black. Malay Archipelago.

***Eudynamis honorata mindanensis* (L.).**

♂ ad. wing about 192 to 200 mm.; crown of ♀ ad. rufous with blackish stripes; first plumage of young blackish. Philippines to Sanghir.

Blasius has (*Braunschweig. Anz.* of January 11, 1888, and *Russ' Isis*, p. 78) separated the Sanghir form as *sanghirensis*\* because he thought it had a differently shaped bill, but I am sorry to say I cannot see this difference, after having compared a series, and I do not therefore admit the form *sanghirensis*. Meyer and Wieglesworth (*B. Celebes* I. p. 211) admitted it but had no material for comparison.

***Eudynamis orientalis orientalis* (L.).**

♂ ad. wing about 213 to 220 mm.; ♀ ad. with cinnamon spots above; first plumage of young buff. Moluccan islands only.

\* This is not quoted in *Cat. B. Brit. Mus.* XIX.

**Eudynamis orientalis rufiventer** (Less.).

Like *E. o. orientalis*, but much smaller, the *females* apparently as a rule with broader bars to the feathers of the underside, but, as we do not well know the different stages of the plumage, this is not quite certain. Wing of *male* apparently 185 to 195 mm. I say **apparently**, as I do not know how to distinguish between the *males* of *E. cyanocephala everetti* and *E. orientalis rufiventer*, unless the latter alone occurs in the north of New Guinea! If the two occur together, they must be "good species," although I have not yet discovered the secret how to distinguish between the adult *males*.

New Guinea, Salwatty, Batanta, Mysol, and perhaps also Aru, but not Penang.

**Eudynamis orientalis salvadorii** subsp. nov.

The specimens from New Britain and New Ireland are evidently closely allied to *E. o. rufiventer*, but differ in the following characters:

They are much larger, the bill larger and longer.

The *males* are less greenish and more steel-blue.

Wing of *males*, 203 to 210 mm. They seem to resemble *E. o. orientalis*, but the *male* is more blue, and the *female* appears to be more barred below and is more frequently spotted above.

This form (type ♂ ad. New Ireland) is named in honour of my friend Count Salvadori, who in the *Ornit. Papuas*. I. p. 358 has already commented on the specimens from New Britain.

**Eudynamis cyanocephala cyanocephala** (Lath.).

♂ ad. wing about 215 to 222 mm.; ♀ ad. with white spots above; first plumage of young pale buff, white below. Australia (? to New Guinea).

**Eudynamis cyanocephala everetti** Hart.

♂ ad. wing about 200 to 210 mm.; ♀ ad. with white spots above; first plumage of young pale buff, white below. Key Islands, lesser Sunda Islands (Alor, Sumba, type Sumba!) and probably parts of New Guinea.

**Eudynamis melanorhyncha** S. Müll.

♂ ad. differs from all the former in having a black bill. Celebes.

**Eudynamis melanorhyncha facialis** Wall.

Like *E. m. melanorhyncha*, but smaller and very often with some white feathers on the forehead and chin. Sula Islands (Nov. Zool. V. p. 127).

**16. Centropus bengalensis javanicus** (Dumont).

Kayeli, Doherty.—This is the bird called *Centropus medius* by Wallace in *Proc. Zool. Soc.* 1863, p. 23.

I cannot quite agree with Messrs. Meyer & Wilesworth, who, in the *Birds of Celebes* I. pp. 213 to 217, lumped together *Centropus bengalensis*, *javanicus* and *rectunguis* of the *Catalogue of Birds*. They may be correct with regard to *rectunguis*, but it seems to me that the Malayan form (*javanicus*) differs conspicuously

from *bengalensis* by its dark mantle, while the black is sharply defined in the continental *bengalensis*. Their remarks about the literature quoted by Shelley are, it is true, correct, and I even believe that the distribution, as quoted by Shelley, requires some alterations, but I am sure that two forms—though as subspecies—must be recognised.

With regard to *Centropus sinensis* I have even to go farther than Shelley in the work of separating, as I find that the Java form differs conspicuously, principally in the form of the bill, from Continental birds, so that it must be recognised as

***Centropus sinensis bubutus* Horsf.**

I shall write about it in more detail on a future occasion.

**17. *Cacomantis aeruginosus* Salvad.**

Two males, one female, one young from Kayeli (Doherty coll.). I confess that it is very difficult to separate these birds from *C. virescens* of Celebes, but the underside is more greyish brown and darker than in the latter. It should probably only be considered as a "subspecies," just as *C. virescens* should evidently stand as a subspecies of *C. threnodes*, of which *merulinus* is very likely distinct.

**18. *Ceyx cajeli* Wall.**

This beautiful little Kingfisher is common near the port of Kayeli, from which it takes its specific name, and on Mount Mada, to at least 3000 ft. high. The young has the beak dark brown with a whitish tip. The crown is only very minutely, almost obscurely spotted with blue; the throat is pale yellow, not white.

**19. *Tanysiptera acis* Wall.**

Wallace (*P. Z. S.* 1863, pp. 23, 24) was perfectly right in separating the Burn species from the *T. dea* which inhabits the other Southern Moluccas, although he procured only an immature individual. The adult male differs from *T. dea*, with which Salvadori (*Orn. Pap.* I. p. 436) united it, in the less blue ear-coverts, the sharply defined blue cap, perfectly black, not blue, mantle, the mottled upper tail-coverts and bases to the rectrices. The undersurface of the young is buff with black edges, while in the perfectly adult bird it is white with only a faint buff tinge and without black edges to the feathers. The iris of the adult male is dark olive-brown, bill red, feet dark greyish or olive. Wing (♂ ad.) 117, central rectrices (fully developed) 285, bill from nostril 20 mm. In the first plumage the upperside is rusty brown, lighter on the crown and wing-coverts, rump and tail-coverts greyish brown, lateral rectrices brown washed with blue, central pair uniform blue. Underside buff with broad blackish lateral and narrow black terminal borders, under tail-coverts uniform buff.

Dumas obtained this species on Mount Mada only.

**20. *Halcyon chloris* (Bodd.).**

One male from Kayeli, one female from Mount Mada. Rather large and blue, wing 114 mm.

21. *Halcyon sancta* Vig. & Horsf.

One from Kayeli (Dumas coll.). This bird (marked ♂) is rather small, the wing only 88 mm.

22. *Alcedo ispida moluccana* Less.

One *male*, Kayeli, Doherty coll. Bill black, rather long, 42 mm. from forehead.

23. *Collocalia esculenta* (L.).

♂ Mount Mada, Dumas coll. Wing 102, glossy green.

24. *Macropteryx mystacea* Less.

Bara and Kayeli. Wings 210 and 215 mm. (Small Moluccan race.)

25. *Hirundo rustica gutturalis* (Scop.).

One adult specimen from Kayeli (Doherty).

26. *Microeca addita* sp. nov.

This remarkable new bird is closely allied to the bird I described (Nov. Zool. IV. pp. 170, 524) as *Microeca oscillans* from the mountains of South Flores. I should not wonder if a new genus would be created for these birds, but I prefer for the present not to separate it from *Microeca*, leaving the vexed question of the genera of *Muscicapidae* to others.

The new species, *Microeca addita*, differs from *M. oscillans* in its larger size, more uniform brown upperside, darker rufous brown, not chestnut-brown tail, whitish (not buff) under tail- and under wing-coverts and lighter breast.

♂ ad. Upperside rufous-brown, darker on the head, brighter and more rufous on the wings and the upper tail-coverts. Tail rufous-brown, more reddish on the borders. Wings blackish brown with rufous-borders to the remiges. Underside whitish, the feathers being grey with white borders, the feathers of the abdomen white, only grey at base. Under tail-coverts white. Under wing-coverts white with buff and brownish shades. Iris olive. Bill black, feet brown. ♂ wing 86, tail 70, metatarsus 19, bill (from forehead) 11 mm. (wings of *males* of *M. oscillans* 76 to 78 mm., not 81 as said on p. 524 of Nov. Zool. IV.); ♀ of *M. addita*, wing 81, tail 62, metatarsus 18·5, bill 10 mm. (♀ of *M. oscillans* wing 75·5 mm.)

One pair was obtained on Mount Mada, 3000 feet high, by Mr. Dumas.

27. *Muscicapa griseosticta* (Swinh.).

One *female*, Kayeli, March 1897 (Doherty coll.)

28. *Erythromyias buruensis* Hart. *Bull. B. O. Club*, VIII. p. 31, (Pl. IV. fig. 2).

♂ ad. Top and sides of head and hindneck slate-colour; upper wing-coverts slate-colour, washed with brown; remainder of upper surface ashy brown. Remiges and rectrices ashy brown, remiges with lighter brown outer edges and whitish brown on the inner edges, more so towards the base; rectrices edges with brown on outer webs. Chin, throat, chest, and sides of body cinnamon-rufous; flanks washed with



brown ; middle of abdomen white ; under tail-coverts buffy-white. Iris olive ; feet brown ; bill black. Wing 69 to 70, tail 52, metatarsus 21, culmen 16 mm.

♀ ad. Like the *male*, but the cinnamon-rufous colour of the underside just a shade less bright and much smaller ; wing 63 to 64, tail 48 to 49 mm.

Juv. Upside blackish brown, each feather with a rusty buff longitudinal spot near the tip, only the crown of the head uniform. Underside rusty buff with blackish tips to the feathers, middle of abdomen buffy white. •

This fine bird was discovered on Mount Mada, at about 3000 feet above the sea.

### 29. *Monarcha buruensis* A. B. Meyer.

One single adult *male* of this very rare flycatcher was obtained by W. Doherty at Kayeli in March 1897. Its iris was found to be brown, feet dark slaty blue, bill blue, tip darker, more blackish brown, cutting edges whitish.

### 30. *Monarcha loricatus* Wall.

A large series from Kayeli (Doherty) and several from Mount Mada (Dumas). Both sexes are alike, black and white when adult, but the *female* is much smaller. Wing of *males* 89 to 90, of *females* 83 to 85 mm. The young of both sexes are brown above, rusty brown below, lateral rectrices rusty buff with greyish edges, central blackish. Iris of young deep brown ; feet dark slaty blue ; bill pale blue ; extreme tip blackish. In the Key species, *Monarcha leucurus*, the sexes are also alike in colour, and the birds with rufous undersurface are the young of both sexes. The adult of *M. leucurus* resembles the *M. loricatus* very much, but the cheeks and sides of neck are white in the latter, black in the former.

### 31. *Monarcha inornatus* (Garn.)

One single adult *female*, with the grey upperside and foreneck rather light, was shot at Kayeli by one of Doherty's hunters. I believe this species is not before recorded from Burn.

### 32. *Myiagra galeata* Gray.

Kayeli and Bara. "♂ ad. Iris deep brown. Feet blackish. Bill slaty blue, tip and edges black" (Doherty). One in moult in March.

### 33. *Rhipidura tricolor* (Vieill.)

Kayeli, Doherty, and Dumas. Moulting in March.

### 34. *Rhipidura buruensis* Wall.

Kayeli, Mount Mada and Buru. The *female* is not so bright, being washed with brown on the upperside, and considerably smaller. Wing of the *male* 87 to 90, of the *female* 81 to 85 mm. Immature birds have buff tips to the upper wing-coverts and remiges, the young has the feathers of the chest tipped with buff instead of largely spotted with white.

### 35. *Rhipidura superflua* Hart.

In *Bull. B. O. Club*, VIII. p. 32 (February 1899) I described this form as follows : ♂ ad. Top and sides of head light brown ; a line from base of bill to

above the eyes brownish buff. Hind-neck and uppermost part of back like the head ; remainder of upper parts bright cinnamon-rufous. Remiges brownish black, the inner edges of all whitish buff ; outer edges of secondaries bright rufous. Rectrices blackish brown, the base and outer edges of basal portion dark cinnamon-rufous ; all, including the central pair, broadly tipped with cinnamon, darker on the middle ones. Throat white, with a black patch across the crop ; remainder of under-surface rufous-buff, the sides washed with brown ; under tail-coverts and thighs cinnamon. Wing 68, tail 80, metatarsus 18, culmen 13 mm. ♀. Smaller, wing about 62 mm. Obtained by Dumas on Mount Mada, at about 3000 feet.

It will be an interesting, though difficult work to study all the red-backed *Rhipidurae* of this group, and to work out their relationship.

### 36. *Edoliosoma marginatum* Wall.

Evidently common at Kayeli. The *female* differs from the *male* in being a just perceptible shade lighter below and in having much lighter, almost white under tail-coverts, besides being smaller. Wing of *males* about 115, of *females* about 110 mm. long. Young birds are lighter below, some of the feathers of foreneck, chest, and sides of body with black shaft-lines and spots along the shaft, and wing-coverts deep buff.

### 37. *Oriolus bouruensis* (Quoy. & Gaim.).

Kayeli, Bara, Mount Mada. The young birds have rusty rufous edges to the quills and wing-coverts.

The wonderful case of mimicry between this bird and the *Philemon* is related in *Proc. Zool. Soc.* 1863, p. 26, and in Wallace's *Malay Archipelago*:

### 38. *Dicrurus atrocaeruleus amboinensis* Gray.

Plentiful near Kayeli and Bara, and not rare on Mount Mada. "Iris always deep brown" (W. Doherty).

According to Salvadori two he saw from Buru had the wings longer than others from Ceram and Amboina. The wings of six Buru examples measure 147 to 149 mm., that of one from the north-east coast 156 mm.

### 39. *Pachycephala examinata* Hart.

Differs from *P. lineolata* from the Sula Islands in having the abdomen (which is white or with a faint ochraceous tinge in *P. lineolata*) ochraceous buff, the under tail-coverts buff instead of white. The wing longer, measuring 81 to 82 mm. Back more brownish, the grey cap thus becoming more conspicuous. The *male* has the throat white, the chest washed with grey. The *female* has the underside uniform ochraceous buff, the wing only about 78 mm. long. Cf. Nov. Zool. V. (not IV. as quoted *Bull. B. O. Club*, VIII. p. 14) p. 131, *Bull. B. O. Club*, VIII. p. 14 (Nov. 1898).

The name of *P. griseonota* is best not adopted at all, but if it should be adopted it would be more sensibly applicable to the Sula form than to that from Buru.

40. *Pachycephala melanura buruensis* Hart.

The male differs from *Pachycephala melanura elio* from the Sula Islands, with which it has hitherto erroneously been considered "identical" in being of a much deeper dark greenish olive colour on the upperside, and in having at the upper wing-coverts pure black with narrow olive edges. The golden-yellow collar on the back of the neck is unbroken, the pectoral pure black collar is very wide and broadly united with the black sides of the head. The remiges are edged with the colour of the back. Tail black. The female differs from that of *elio* in the colour of the underside, which is pale buffish brown below, lighter in the middle of the abdomen, darker and browner on the chest, and becoming more greyish on the throat. Under tail-coverts buffy yellow. The young male is more rufous below and darker on the back than the female, which is olive-brown above. ♀ ad. wing 93, tail 73, culmen 18 to 19 mm. (Cf. *Bull. B. O. Club*, VIII. p. 33).

Kayeli, Bara, Mt. Mada.

41. *Cinnyris zenobia* (Less.).

Frequent at Kayeli and Bara.

42. *Cinnyris proserpina* (Wall.).

Mount Mada and Kayeli. In the *Catalogue of Birds* this very distinct form is mixed up with *C. nigriscapularis* into *C. aspasia*, but all these forms are distinct, though representative forms.

43. *Dicaeum erythrothorax* Less.

This beautiful little bird was obtained at Kayeli and on Mount Mada. A nest from Kayeli is protected by some large overhanging leaves and beautifully woven of soft rufous fibres, the entrance-hole being very near the top.

44. *Philemon moluccensis* (Gm.).

This bird, which so closely resembles the *Oriolus bouruensis*, that their synonymy has been mixed up, although they belong to widely-different families, is evidently common on the island. The young is like the adult bird, but the feathers on the sides of the lower throat are widely edged with pale sulphur-yellow, and the quills have greenish outer edges. The fresh feathers, after the moult, are more olive, but they become somewhat foxy brown when worn and faded.

45. *Zosterops buruensis* Salvad.

This bird is extremely rare in collections, but Dumas got four specimens on Mount Mada. Three are marked "♀," one ♂, but it is evident that two are males, two females, and two are remarkably smaller than the other two. These birds do by no means have their nearest in the Celebesian *Z. intermedia*, which differs widely in its more uniform under-surface, lighter and more yellowish upperside and other characters, nor in *Z. chloris* from Banda, which is also lighter and more yellowish above and has the flanks and sides of breast much paler, but in a bird inhabiting Batjan and Ternate. This latter bird agrees with *Z. buruensis* in the dark upperside and dark sides, but it differs slightly in being a little smaller, less golden olive and more green above, and in having the sides of the body also more greenish and even still darker! I name it

**Zosterops obstinatus spec. nov.**

Type : Batjan, September 1897, 4000 feet high, Doherty coll. Unfortunately I have before me only two examples from Batjan and three from Ternate, collected by Doherty, and they are all bad skins. Nevertheless, they show very distinctly that the Ternate bird is not quite the same as the Celebensian *Z. intermedia*. It differs from the latter in having a greener shade on the upperside, the rump and forehead less yellowish, and much darker and more olive flanks and sides of the body. Geographically one would naturally expect the Ternate and Batjan birds to be the same, or nearly the same. Owing to the bad state of our skins I cannot say confidently whether they are the same or not, but I cannot at present separate them, though our specimens from Batjan seem to be darker above and on the flanks again than those from Ternate. Why the Ternate bird was always confounded with *Z. intermedia* is strange to me, as so many other forms were separated on account of differences not a bit more striking. Probably a number of these forms will be united into one species by future workers, and kept only **sub**-specifically distinct, but it will require much study to do so properly, and as long as we do not lump them at present, we will advance our knowledge and pave the way for the future.

**46. Criniger mysticalis Wall.**

Evidently frequent at Kayeli and Mount Mada. The *female* is smaller than the *male*, wing ♂ about 110, ♀ about 100 mm. The name was originally spelt as above.

**47. Pitta rubrinucha Wall.**

Two *males* of this beautiful *Pitta* were obtained on Mount Mada.

**48. Phyllergates everetti dumasi Hart.**

(*Bull. B. O. Club* VIII. p. 31 [1899]).

Differs from *Phyllergates everetti* of Flores in being slightly more brownish on the nape and less greenish, more rufous-olive on the back, and in having no indication of white on the outer rectrix. Wing 46 to 49 mm.

Four specimens were obtained on Mount Mada.

The distribution of *Phyllergates* so far east is of the ntmost interest. The *Catalogue of Birds* (VII. 1883) knew it only from India, Java and Sumatra, then Whitehead discovered it in Borneo and on the Philippines ; Meyer and Wigglesworth described one from Celebes, Everett sent it from Flores, and now it appears in the Moluccan Islands.

**49. Androphilus disturbans sp. nov.**

Mr. Dumas shot on Mount Mada a bird which he marked " ♀," and which had a chocolate-brown iris. It is probably (judging from the spotted appearance of the lower throat and breast) an immature bird. It has ten rectrices, very strong feet, and belongs evidently to the genus *Androphilus*, so far only known from high elevations on Borneo and Celebes. The bird before me is above very deep olive-brown. The underside is yellowish buff, lower throat with brown tips to the feathers, chest strongly washed with rufous brown, abdomen, thighs and under tail-coverts brown, under wing-coverts spotted buffy and brown. The specimen is not



in very good condition. The bill from the base on the forehead about 18, from gape to tip 20, wing 63, metatarsus 25, hind-toe with claw 17, tail very much worn, apparently when perfect about 50 mm.

This bird also is quite a surprise in the Moluccas.

#### 50. *Cisticola exilis* (Vig. & Horsf.).

Mount Mada and Kayeli. Wallace (*Proc. Zool. Soc.* 1863, p. 25) described the Buru bird as *C. rustica*, but, according to Sharpe, it is the same as *C. exilis* (*Cat. B.* VII. p. 269).

#### 51. *Acanthopneuste everetti* Hart.

(*Bull. B. O. Club.* VIII. p. 31 [Feb. 1899].)

♂ ad. Top of head greyish brown; superciliary line pale grey, not very conspicuous. Rest of upperside dark olive-green. Tail and wings blackish brown edged with the colour of the back, rectrices with narrow white edges to the inner webs. Throat dirty white; remainder of under-surface bright sulphur-yellow; sides of breast and body washed with greenish olive. Wing 59, tail 42, metatarsus 22, culmen 13 mm. ♀ like the males, but a little smaller, wing 58 mm. *Juv.* Crown olive-green like the back, throat yellow like abdomen.

The geographical extension to Burn of this bird, which is evidently related to *Acanthopneuste presbytis* of Timor and *A. floris* of Flores is most interesting. It differs from *A. floris* by its greyish brown crown, whitish throat and absence of white in the tail, the narrow edges to the inner webs of the rectrices not being visible when the tail is shut or even moderately spread out. *A. everetti* differs still more from *A. presbytis*, in having no white in the tail, in wanting the pale central line on the crown, in its darker abdomen and much larger size.

*A. everetti* was discovered by Dumas on Mount Mada.

#### 52. *Acanthopneuste borealis* Blas.

Common in winter.

I very much doubt that the species formerly included in *Cryptolopha* and now placed in *Acanthopneuste* really belong there at all. The type of *Acanthopneuste* is *borealis*, which seems to me to be a very good *Phylloscopus*, while the Malayan species of the group to which my *floris*, *everetti*, and *presbytis* belong, are evidently not *Phylloscopi*, nor to be retained in *Cryptolopha* proper.

#### 53. *Geocichla dumasi* Rothsch.

[Plate IV. fig. 3.]

One single male was obtained on Mount Mada, and described by Mr. Rothschild (*Bull. B. O. Club.* VIII. p. 30, Feb. 1899) as follows:—

♂ ad. Whole upper-surface bright olive-rufous brown, with two tufts of creamy white feathers, one on each side of the rump. Lesser upper wing-coverts like back; greater upper wing-coverts black, with two rows of large round white spots. Remiges blackish brown; the outer webs of the primaries with narrow, those of the secondaries with broad, olive-rufous borders. All wing-feathers, except the outer three, with large white patches near the base of the inner webs. Tail like the back, but darker. Whole throat and chest black; abdomen white;

flanks olive-yellowish brown, some feathers on the side of the breast olive with black tips, as well as some of the white breast feathers, thus forming a broken irregular band across the breast. Under tail-coverts creamy white. Under wing-coverts mixed black and white. Iris dark brown; bill black; feet light. Culmen 23, wing 94, tail 68, tarsus 32 mm.

*Hab.* Mount Mada, Burn (3000 feet), August 1898.

54. *Calornis obscurus* (Bp.).

Kayeli, common.

55. *Munia molucca* (L.).

Typical *molucca* from Bara and Kayeli.

56. *Macropygia amboinensis* (L.).

Common on Burn, where it was found at Kayeli by Wallace, Forbes, Doherty and Dumas. Forbes obtained it also on Lake Wakolo, Dumas on Mount Mada, at about 3000 feet above the sea. The species is known from Amboina, Ceram and Burn. The colour of the crown is very variable, being sometimes much lighter, sometimes deeper rufous-cinnamon. The young birds before me have the feathers of the crown deep rufous-cinnamon, only blackish at the utmost base, like the adult ones.

57. *Reinwardtoena reinwardtsi albida* subsp. nov.

The Burn-form of the genus *Reinwardtoena*\* differs from the form inhabiting the Northern Moluccas and New Guinea in being much more whitish below. The underside is almost pure white without the lavender-grey coloration so conspicuous in most forms of *R. reinwardtsi*.† This is only to be seen on the sides of the breast and flanks, and on the under tail-coverts. Wing ♂ 235, ♀ 225 mm. Iris chocolate-brown. Type: Mount Mada, Burn, 3000 feet, Dumas coll. This species seems to be rare on Burn, as neither Wallace, Forbes, nor Doherty procured it there. Two specimens, ♂ and ♀, however, were shot by Dumas, and there is one labelled Burn in the Leiden Museum. Probably the Amboina and Ceram specimens will belong to my *albida*.

The distribution and the geographical variation of Reinwardt's Pigeon is very interesting. The original type was erroneously stated to be from Celebes, but seems to have come from one of the Northern Moluccas. This form, to which I have restricted the name of *reinwardtsi*, has the abdomen more or less washed with lavender-grey. In the *Bull. B. O. Club*, v. VII. p. 35 (February 1898) I have described specimens from Obi Major as *R. r. obiënsis*, but a moulting skin received from Mr. Lucas, and the fading of the yellowish buff on the chin and cheeks in the collection have shown me that the coloration is not natural, but is the result of the juice of some kind of fruit.‡ A similar staining is also visible in the Burn specimens. As it is, I cannot separate Obi specimens from typical *reinwardtsi*, although one of them is practically as white as my *albida* from Burn. The darker New Guinea

\* This is the original spelling, but in the same year (1854) it appeared also in the form of *Reinwardtaenas*; this name, varied with *ae* and *oe* and with or without *s*, has always been in use, until in 1890 Heine invented for it the unnecessary substitute *Coccyzenas*, which nobody accepts.

† Thus originally spelt.

‡ This case is similar to the one of the supposed *Sylvia gularis* from the Cape Verde Islands, only there attention had been called to the real facts long ago.

race has been separated by me as *R. r. griseotincta* (see Nov. Zool. III. p. 18). According to Salvadori it is absent from Jobi, Mefoor and Miosnom, but Doherty sent us some Jobi skins which seem not to differ from the New Guinea ones (*griseotincta*), and further researches may perhaps also turn it up on the other islands. The birds from Misorì Island, in the Geelvink Bay are separated as a subspecies *minor* by Schlegel, and elevated to specific rank by Salvadori. They are much purer white below and smaller. Except in their smaller size they do not seem to differ from *albida*. Wing about 210 mm.\*

We can, therefore, at present recognise four local subspecies of *Reinwardtoena reinwardtsi*.

**a. *Reinwardtoena reinwardtsi reinwardtsi*.**

Abdomen lavender-grey, wing about 220 to 230 mm.†

*Hab.* Northern Moluccas—Batjan, Halmahera, Obi.

(Synonyms. *R. typica* Bp., *R. r. obiensis* Hart.)

**b. *R. reinwardtsi griseotincta*.**

Nearly the entire underside lavender-grey, wing about 230 to 245 mm.

*Hab.* New Guinea, Waigin, Saluwatty, Jobi.

**c. *R. reinwardtsi minor*.**

Nearly the whole underside whitish. Wing about 210 mm.

*Hab.* Misorì and Biak in the Geelvink Bay.

**d. *R. reinwardtsi albida*.**

Practically the whole underside whitish. Wing about 225 to 235 mm.

*Hab.* Southern Moluccas—Burn (type), and probably Amboina and Ceram.

**e. *R. browni*.**

Differs from the former in having a slaty, not chestnut, back and tail, and inhabits the Duke of York Islands and New Britain, and is like

**f. *R. crassirostris***

with a larger beak, from the Solomons, more distantly related, and better kept as a separate species. The genus *Coryphoenas* for the last is an unnecessary encumbrance.

**58. *Columba mada* Hart.**

(*Bull. B. O. Club*, v. VIII. p. 33.)

This curious pigeon resembles in its coloration the so-called *Gymnophaps albertsi*, from which it differs in its whitish throat, light abdomen, want of terminal bar on rectrices and other characters. The naked space round the eye is much less in extent than in the *Gymnophaps albertsi*. If the genus *Gymnophaps* is recognised, I suppose *mada* would have to be placed in it; but I do not see the necessity of that genus. If it is recognised, then several more subdivisions of *Columba* must be made for the sake of consistency. The adult male of *Columba mada* has the bill yellow, red at base. Top of head and neck pure grey, merging into the colour of

\* I could only examine one adult male collected by Doherty on Biak, an island immediately close to, but separate from Misorì.

† Males are larger than females.

the rest of the upper surface, which is slate-colour with light grey borders to the feathers. The rectrices are deep slaty-brown with very narrow pale brownish tips. Sides of head, throat, chest, and breast buff, almost pure white on the throat. The buff colour of the breast merges into the vinaceous-cinnamon colour of the abdomen. Under wing-coverts cinereous. Under tail-coverts light cinnamon with lighter, somewhat rosy edges. Thighs whitish grey. Feet and iris red. Wing 229, tail 170, exposed portion of culmen 16 mm. ♀ ad. Like the adult *male*, but smaller: wing 213, tail 155 mm. *Juv.* Above blackish slate-colour, lighter on the neck. Underside pale cinnamon, under wing-coverts grey with pale cinnamon tips, under tail-coverts cinnamon.

A few adult and young specimens were shot at about 3000 feet on Mount Mada, in August 1898.

59. *Myristicivora melanura* (G. R. Gray).

Only this species of White Pigeon was procured by Wallace, Forbes, Doherty, and Dumas, at Bara, Kayeli and on Mount Mada.

60. *Carpophaga perspicillata* (Temm.).

Common on Buru, where every collector met with it. Wallace, Forbes, and Doherty procured specimens at Kayeli, Doherty at Bara, on the north-west coast, and Dumas on Mount Mada, at 3000 feet above the sea. The iris is dark brown, cere dark purple, legs and feet purple. The sexes do not differ. A specimen from December moults the remiges. This pigeon inhabits the Northern Moluccas (Halmahera and adjacent islands and Batjan) and Buru.

61. *Ptilinopus prasinorrhous* (G. R. Gray).

A common bird on Buru, where it was shot at Kayeli and on Mount Mada, at 3000 feet. "Iris orange red" (Dumas). The distribution of *P. prasinorrhous* is somewhat remarkable, namely, the Western Papuan Islands and some, but not all, of the Moluccas. While inhabiting the islands in the Geelvink Bay it is said to be absent from New Guinea, and while being found as far north as Weeda and Dammar (near Halmahera), it is not recorded from Halmahera and Batjan! Specimens from the various places do not seem to differ.

62. *Ptilinopus viridis* (L.).

This oldest known form of the *Ioteron* group of Green Pigeons is only known from the Southern Moluccas: Amboina, Ceram, Buru, and the adjacent little islands. Doherty procured specimens at Kayeli and Bara on the north-west coast of Buru. The sexes do not differ at all.

63. *Megapodius forsteni* Temm.

Kayeli and Mount Mada, 3000 feet. The adult male from Mount Mada is darker than the female from the same place and a pair from Kayeli. Especially the head and abdomen are very dark and the upper part of the mantle is very pure grey.

64. *Streptopelia interpres* (L.).

Frequenting the sea shores.

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## ON THE BIRDS OF SOUTHERN ARABIA.

By W. R. OGILVIE-GRANT.

WITH FIELD NOTES BY A. BLAYNEY PERCIVAL.

[Plate X.]

IN the spring of 1899, the Governor of Aden, General O'Moore Creagh, V.C., finding it advisable to make a political trip through the interior of Southern Arabia, wrote to the Director of the Natural History Museum suggesting that a naturalist should accompany the expedition.

The zoology of Arabia being still very imperfectly known, Professor E. Ray Lankester readily acceded to the Governor's most kind request, and asked me to undertake the arrangement of the details. The necessary funds for the expedition were partly supplied by grants from the Royal Society and the Hon. Walter Rothschild.

A willing volunteer was found in Mr. A. Blayney Percival, who had already spent three years collecting zoological specimens in the Transvaal and British Central Africa; and the services of the late Mr. W. Dodson, a professional taxidermist, were also engaged. It was with great regret that we learnt of the death of this promising young naturalist, which took place at Aden on October 20th, just as the expedition was on the point of returning to England. Fever and acute dysentery, brought on by drinking impure water in the Abian country, rapidly proved fatal; and Mr. Percival very nearly lost his life from the same cause. As is too often the case, no care was taken to boil the drinking water, and there can be little doubt that had this very necessary precaution been followed, no serious consequences would have resulted.

General Creagh finding it necessary to make his trip much earlier than he had at first contemplated, Messrs. Percival and Dodson made a somewhat hurried start from England, and arrived at Aden on August 6th. They found all arrangements complete, and the expedition only awaiting their arrival to start. It had been the Governor's intention to make a somewhat extensive trip through Southern Arabia, but on August 19th he was unfortunately obliged to return to Aden on important business, which ultimately prevented his return.

This unforeseen event rendered it impossible for Mr. Percival to travel in parts of Southern Arabia which he would otherwise have visited. While with General Creagh's party the naturalists proceeded to Shaikh Othman and Lahej, and thence worked their way north by Al Anad, Jebel Manif and Al Milah as far as Jimil, returning south by a more easterly route through open sandy desert to Lahej, which was reached on August 18th.

Before returning to Aden the Governor specially recommended Mr. Percival and his party to the care of the Sultan of Lahej, who treated them with the greatest kindness while they remained in his country, providing them daily with fowls and fresh meat, and placing camels and horses at their disposal. At this time Mr. Percival made the acquaintance of Mr. G. W. Bury, an Englishman who has done more travelling and exploring in south-west Arabia than any

other European. This gentleman, being unattached, joined the party, and by his knowledge of the people and their language proved of the greatest assistance.

During their stay in the district, the country and Wadis to the east and west of Lahej, and as far north as Jebel Mani', were thoroughly explored, and a number of species not previously recorded from South Arabia were obtained. A thick-knee plover (*Edicnemus dodsoni*), a bush-shrike (*Telephonus percivali*), and a lark (*Ammomanes saturatus*) proved to belong to undescribed species.

On September 15th Mr. Percival and his party left Lahej, and, leaving the baggage at Shaik Othman, returned to Aden to obtain permission to visit the Abian country, which lies to the east. While waiting for the Governor to obtain a favourable reply from the Sultan of Shukra they took up their quarters at the Government bungalow at Shaik Othman, and worked the surrounding country to the south of Lahej and the desert to the west towards Little Aden.

On the evening of September 28th a start was made for the Abian country, which was reached on the following evening; and, after the usual negotiations with the Sultan had been completed to his satisfaction, a camp was formed near Al Khaur, on the Wadi Hassan, where birds and small mammals were fairly numerous.

The water at this camp must have been polluted, and proved the source of all the subsequent misfortune, for about twelve days after their arrival all the party were attacked with low fever of a very severe type. At this time Mr. Bury was obliged to leave the party and return to Aden. Between October 10th and 16th Mr. Percival made a trip through the mountains to the east in search of Ibex, etc., leaving the camp in charge of Dodson, who was then apparently quite well and anxious to continue collecting in the district, which had proved a good one. On his return, though suffering himself much from daily attacks of fever, he found Dodson in a much worse plight, and very ill and weak. Moving by easy stages, the party retraced their steps, arriving on the night of October 19th at Aden, where, as already related, poor Dodson shortly succumbed. Plate X. shows the route of the travellers.

The season during which the expedition was made was too early for complete success, and almost all the birds obtained were in full moult, and consequently difficult to make up into good skins; while insects were very scarce. On the whole, however, as will be seen by the following list, our ornithological knowledge of South Arabia has been very considerably increased, and we owe a debt of gratitude to Mr. Percival and his unfortunate companion who lost his life in the pursuit of science.

The results of the ornithological researches round Aden and Lahej of Colonel Yerbury and Messrs. Barnes and Hawker have been incorporated in the present paper, as well as the collection made by Dr. H. O. Forbes and myself in November 1898; so that the following list gives a complete account of the avifauna of South Arabia as known up to the present time, and adds forty-seven species to the list published by Colonel Yerbury in the *Ibis* for 1896.

The collection made by Messrs. Percival and Dodson is in the British Museum, and a second almost complete set at Tring.

### 1. *Corvus corax* (?).

*Corvus corax* Linn.; Yerbury, *Ibis* 1896, p. 26.

Colonel Yerbury says the Common Raven is fairly common inland; no specimen, however, was obtained.

2. *Corvus umbrinus*.*Corvus umbrinus* Sundev.; Yerbury *Ibis* 1896, p. 26.*a-c.* ♂ ♀. Lahej. September 4th.

The above birds, in freshly moulted plumage, have the feathers of the head and neck purplish black with an oily gloss. All three are apparently younger birds, having the bill more slender and less deep than that of the fully adult.

[Round Lahej these birds are extremely numerous, and we found them common at Dirjaj in the Abian Country. They are usually to be found round towns or villages, where with vultures and Paria dogs they act as scavengers. They are of somewhat social habit, and often to be seen in flocks. During the ripening of the dates the crows do a large amount of damage by eating the fruit. They and the fruit bats are so destructive that the natives have to make bags of palm leaves and fix these over the bunches of dates to protect them. To see a crow trying to catch a lizard is a very funny sight. Having chased him into a tuft of grass, a wonderful dance is executed round and over the hiding-place, until at last the lizard is captured and devoured.—A. B. P.]

3. *Rhinocorax affinis*.*Corvus affinis* Rüpp.; Yerbury, *Ibis* 1896, p. 26.*a.* Ad. Ma'ir, Abian Country. October 13th.

A bird of this species in very worn brown plumage was at first sight mistaken for *Corvus edithæ* from Somaliland, which it superficially resembles in size. The present species, however, has the down at the base of the breast feathers grey, instead of white, as in *C. edithæ*.

[This Mountain Crow, only met with on the highest ground, was first seen near Jimil, but not obtained until I was on the mountains near Ma'ir, in pursuit of Ibex. It was a fairly numerous species, but I found it very wary and difficult to approach.—A. B. P.]

4. *Dilophus carunculatus*.*Dilophus carunculatus* (Gm.); Yerbury, 1896, p. 26.

Only recorded by Col. Yerbury and the late Mr. Barnes.

5. *Oriolus galbula*.*Oriolus galbula* Linn.; Yerbury, *Ibis* 1896, p. 23.*a.* ♀ ad. Shaik Othman. September 23rd.*b-d.* ♂ imm. Al Khaur, Wadi Hassan, Abian Country. October 27th.

[Iris and bill black; legs slate.

We saw one or two Golden Orioles at Shaik Othman and several in the Abian Country.—A. B. P.]

6. *Estrilda rufibarba*.*Estrilda rufibarba* (Ehrenh.); Yerbury, *Ibis* 1896, p. 27.

Colonel Yerbury obtained examples near Lahej in January 1884.

7. *Aidemosyne cantans*.*Aidemosyne cantans* (Gm.) ; Yerbury, *Ibis* 1896, p. 27.

- a-f.* ♂ ♀ ad. Lahej. August 23rd and September 3rd.  
*g.* ♂ ad. Shaka, N. of Lahej. August 29th.

[Very common round Lahej and Shaik Othman. Numbers are caught by boys and sold in Aden, where many of the Indian natives keep large numbers of birds.—A. B. P.]

8. *Hyphantornis galbula*.*Hyphantornis galbula* (Rüpp.) ; Yerbury, *Ibis* 1896, p. 27.

- a. b.* ♂ ad. Lahej. August 11th.  
*c-f.* ♂ ad. Lahej. September 9th.  
*g.* ♂ vix ad. Lahej. September 15th.  
*h. i.* ♀ ad. Habil, Wadi Abraïn, N.W. of Lahej. September 13th.  
*k. l.* ♀ ad. Shaik Othman. September 23rd.

[Very common wherever trees are found.—A. B. P.]

9. *Passer domesticus*.*Passer domesticus* (Linn.) ; Yerbury, *Ibis* 1896, p. 28 ; Hawker, *Ibis* 1898, p. 375.

- a-f.* ♂. ♀ ad. et imm. Lahej. September 9th.  
*g. h.* ♂. ♀ ad. Shaik Othman. September 23rd.

[Very common in Lahej and all the towns towards Jimil, but I do not remember seeing it in Dirjaj or Ma'ir, in the Abian Country. In Lahej sparrows are very common and as bold as their English relatives, feeding about the streets and paths of the town. They breed about the Sultan's palace in the loopholes around the roofs and in the ceilings of passages, which are made of sticks laid across from side to side. As every house has a flat roof the walls of which are loopholed, they find plenty of nesting places. There were young in the nests when we were there, in August 1899. At Dar Mansur, a very small village of one tower and a few huts, they were numerous ; and as there was no cultivated ground of any sort in the neighbourhood, merely open sandy desert, I am at a loss to know what they lived on. In the Mimosa belt I saw a flock of sparrows far from any houses or huts, but they seemed quite at home.—A. B. P.]

10. *Passer euchlorus*.*Passer euchlorus* (Licht.) ; Yerbury, *Ibis* 1896, p. 27. Hawker, *Ibis* 1898, p. 375.

- a-d.* ♂. ♀ ad. et imm. Lahej. August 11th.  
*e.* ♂ ad. Wadi Bana, Abian Country. September 29th.  
*f-p.* ♂. ♀ ad. Al Khaur, Wadi Hassan, Abian country. October 2nd to 5th.

As will be seen from the above list there are a fair series of this species in the present collection. Colonel Yerbury makes some interesting remarks on this species, and writes :—" It would be interesting if some one would devote a little time to working out the changes of plumage of *males* of this species, as *males* in all stages are to be seen in the flocks :—(i.) a bright canary yellow, with long, pale fawn-coloured, almost white tail ; (ii.) like the former, but wanting the long tail ; and (iii.) a form hardly distinguishable from the *females*. What does this mixing up of forms mean ?—I concluded it to indicate that these birds bred all the year round, and the fact that form i. is rare while form iii. is by far the commonest, may lend some support to this ; or it may mean that the *males* begin to assume the



canary-coloured plumage at the end of the first year, but do not assume the long tail till the beginning of the second. As the birds breed gregariously, it would be difficult to identify the actual owners of any particular nest." The truth of the above remarks is partly borne out by the observations of Mr. A. B. Percival, who found the *females* rare and difficult to obtain, the majority of dull-coloured hen-like birds in a flock proving on dissection to be *males* and referable to form iii. There are several examples of form ii.—that is, the bright canary-yellow bird with the tail normal. I have never seen examples of form i. with the "long, pale fawn-coloured, almost white tail," and Mr. Percival did not meet with it. We may therefore infer that it is a seasonal appendage, as some of the birds met with are evidently very old examples. It is quite possible that the present species is not a true *Passer* and should be placed in a distinct genus.

[Rather scarce in the neighbourhood of Lahej, but very common in the Abian Country.—A. B. P.]

### 11. *Fringillaria striolata*.

*Fringillaria striolata* (Licht.) Sharpe, *Cat. B. Brit. Mus.* xii. p. 561 (1888).

a. b. ad. Ma'ir, Abian Country. October 13th.

This is the first time this species has been recorded from Southern Arabia.

### 12. *Alæmon desertorum*.

*Alæmon desertorum* (Stanl.) ; Yerbury, *Ibis* 1896, p. 29.

a.—b. ♂ ♀ ad. Lahej. August 24th.

c.—h. ♂ ♀ ad. Shaik Othman. September 20th to 27th.

i. ♂ ad. Huswa, Bay of Aden. September 19th to 20th.

[Iris brown ; bill grey ; legs flesh-colour.

This fine Lark is only found on the low deserts near the sea, and is commonest along the coast to the west of Shaik Othman and eastwards towards Dar Mansur. None were seen beyond the belt of Mimosa trees to the south of Lahej, and only one or two were met with in the Abian Country.

This Lark has a habit of flying up like a Skylark for perhaps 100 ft. and then fluttering downwards, uttering a few notes as it drops. This usually takes place at dawn. It is a very fast runner and is extremely difficult to catch. The flight is very peculiar, and the white bars show very plainly and make the bird look much like a Hoopoe when on the wing.—A. B. P.]

### 13. *Galerida cristata*.

*Galerida cristata* Linn. ; Yerbury, *Ibis* 1896, p. 29.

a.—e. ♂ ♀ ad. Shaka, N. of Lahej. August 28th to 31st.

f. ad. Haithalhim, N.W. of Lahej. September 6th.

g.—u. ♂ ♀ ad. Lahej. August 11th to September 8th.

o.—u. ♂ ad. Shaik Othman. September 22nd to 27th.

v. ♂ ad. Huswa, Gulf of Aden. September 19th.

I have handed the whole series of Crested Larks over to Mr. Hartert for identification, and he has kindly furnished me with the following remarks :—

"A considerable number of Crested Larks were collected at Shaik Othman, Lahej, Shaka, Haithalhim, Huswa. Although they were collected at rather an unfortunate time of year, most of the specimens being in moult, the series shows beyond doubt that they all belong to one form—viz., a sandy subspecies of the

*Galerida cristata* group, and that no specimen of the *G. theklæ* group is among them. The latter, in fact, has not yet been found in Arabia, nor apparently anywhere farther east than Somali-land. The Arabian specimens closely resemble the long-billed Crested Larks from Somali-land, except that the latter seem to be slightly smaller. These long-billed *Galeridæ* from Somali-land are very unlike the thick-billed ones from that country, and I take this opportunity to emphasise the fact that Somali-land—like Southern Spain and most parts of North Africa—is inhabited by two totally distinct species, one of the *theklæ* group, identified in the British Museum and by Erlanger with *G. theklæ ellioti*, and one of the *cristata* group. This fact has hitherto been generally lost to science, as most authors on Somali-land birds have not distinguished the different forms of Crested Larks. The birds from South Arabia resemble the North Indian forms, but are more of a pale sandy and less greyish tint. Individuals from Afghanistan and Baluchistan are very similar, but seem to be a little smaller. Larger series, with the wings not in moult, must, however, be compared before settling the question of size. At present I refrain from naming the Arabian Crested Lark, although I am sure that it requires a new subspecific name. Science, however, would hardly be benefited in this case by bestowing a new name in a solitary instance; and I prefer to await an opportunity of fully reviewing the Eastern Crested Larks, before giving new names to such forms as may require them. I must, furthermore, admit that it will require some study to point out the distinctive characters between the pale Southern Spanish and Senegambian, as well as the Greek and Montenegrin races. The form from the Hungarian littoral has been identified by Madarasz (*Bull. B. O. Club*, x. p. 99) with *senegalensis*, but it is considerably larger, darker, more rufescent, and more distinctly spotted on the under wing-coverts near the margin. It requires a new name, unless one of C. L. Brehm's can be referred to it, a question which it is not easy to settle, as Brehm often mixed up his Crested Larks from various localities, and united very different forms under one name. I am, nevertheless, quite willing to drop my name, *deltæ*, for one of the most distinct forms of long-billed *Galeridæ*, in favour of Brehm's *nigricans*. It is true that Brehm united with typical dark birds from the Nile Delta, individuals of a dark shade from Germany, and in his collection there are birds called *nigricans* from Sandersleben, Gotha, Anna, Ahlsdorf, Dresden, and only **one** labelled 'Egypt,' the latter being the same as my '*deltæ*,' but his description can apply to the latter form, and he says (*Vogelfang*, p. 124) 'Egypt and Thuringia,' and later on (*Naumannia* 1858, p. 206) 'darkest on the black soil of the Nile, and shot in Germany near Dresden, Auma, and Gotha.' Needless to say that the latter have not much to do with the birds from Lower Egypt, but, as I said, one might accept '*nigricans*' for the dark form from the Nile Delta."

[The Crested Lark is found in large numbers all over the low deserts especially near Lahej and the neighbouring districts and thence up to the foothills of Jebel Manif and Jimil. In the Abian Country very few were seen.—A. B. P.]

#### 14. *Mirafr cantillans*.

*Mirafr simplex* Heugl. ; Sharpe, *Cat. B. Brit. Mus.* xiii. p. 595 (1890).  
*Mirafr cantillans* Blyth. ; Sharpe, *Cat. B. Brit. Mus.* xiii. p. 605 (1890).  
*Mirafr* sp. inc. Barnes, *Ibis* 1893, p. 84.

<i>a.</i>	♂ ad.	Shaka, N. of Lahej	August 28th.
<i>b—d.</i>	♀ ad.	Habil, Wadi Abraïn, N.W. of Lahej	September 13th and 14th.
<i>e—f.</i>	♂	Lahej	August 25th.

Iris hazel ; bill and legs flesh-colour. (A. B. P.)

The series of this Lark collected by Mr. Percival in the neighbourhood of Lahej undoubtedly belong to *M. simplex* Hengl. Most of the specimens which are in worn plumage agree well with the type ; but a *female* collected at Habil on September 13th, which has the new feathers of the mantle half grown, clearly shows that it belongs to the Indian species *M. cantillans*, which no doubt extends across Baluchistan and Persia to Arabia. *M. simplex* is therefore founded on worn examples of *M. cantillans*.

In worn Indian examples the spots on the chest are nearly obsolete, and in this stage they agree with the type of *M. simplex*.

### 15. *Ammomanes saturatus* subsp. nov.

*Ammomanes deserti* Sharpe ; *Cat. B. Brit. Mus.* xiii. p. 646 (part specimens *u* to *y* from Abyssinia).

<i>a.</i>	♀ ad.	Jebel Manif, N. of Lahej	August 13th (type of the species).
<i>b. c.</i>	♀ ad. et ♂ imm.	Jebel Manif, N. of Lahej	August 13th and 14th.
<i>d.</i>	ad.	Ma'ir, Abian Country	October 13th.

Iris brown ; bill and legs flesh-colour. (A. B. P.)

The four birds collected by the Percival-Dodson expedition differ conspicuously from typical *A. deserti* Licht. in having the general colour of the upper parts dark grey instead of isabelline, and the rufous on the rump and edges of the tail-feathers more pronounced. In writing about *A. deserti* (*Cat. B. Brit. Mus.* xiii. p. 646) Dr. Sharpe makes the following remarks :—"The Palestine birds are rather larger than the Egyptian, and the Abyssinian birds are much darker grey than any from Egypt ; they will probably be found to represent a permanently dark race."

The dark Abyssinian specimens alluded to above, and entered in the list of specimens under the letters *u* to *y*, agree perfectly with the Arabian examples before me, and differ in so marked a degree from typical *A. deserti* that it seems necessary to recognise them under a distinct name.

Total length 5·5 in. ; culmen 0·65 ; wing 3·8 to 4·0 ; tail 2·55 to 2·7 ; tarsus 0·9 to 1·0.

[I first met with this Lark at the foot of Jebel Manif, where I saw a few and obtained a couple of specimens. One or two more were seen near Jimil and a few amongst the hills near Ma'ir, but they were nowhere common. It is essentially a hill bird and never seen on plains.—A. B. P.]

### 16. *Pyrrhulauda melanauchen*.

*Pyrrhulauda melanauchen* (Cab.) ; Yerbury, *Ibis* 1896, p. 29 ; Hawker, *Ibis* 1898, p. 375.

<i>a—f.</i>	♂ ♀ ad.	Wadi Al Kabir, W. of Lahej, August 22nd.
<i>g—h.</i>	♂ imm.	Shaka, N. of Lahej, August 28th to 30th.

[Iris brown ; bill grey ; legs light flesh-colour.

Very common in lower deserts and wadis on the way to Lahej, but none were seen farther inland, nor do I remember any being met with in the Abian Country. They are strange little birds, with their plaintive note and peculiar colouring. The dark underparts of the *male* show very distinctly when the bird is on the wing.—A. B. P.]

17. *Motacilla alba*.*Motacilla alba* Linn. ; Yerbury, *Ibis* 1896, p. 25.

Common winter visitor.

18. *Motacilla melanope*.*Motacilla melanope* Pall. ; Sharpe, *Cat. B. Brit. Mus.* x. p. 497 (1885).*a.* ♂ imm. Shaik Othman. September 26th.*b.* Imm. Al Khaur, Wadi Hassan, Abian Country. October 8th.

This is the first time the Grey Wagtail has been recorded from Southern Arabia.

19. *Motacilla flava*.*Motacilla flava* Linn. ; Sharpe, *Cat. B. Brit. Mus.* x. p. 516. Pl. vi. Figs. 3—5 (1885).*a—b.* ♀ imm. Lahej. September 4th.*c.* Vix. ad. Habil, Wadi Abrain, N.W. of Lahej. September 14th.*d—h.* ♂ ♀ imm. Shaik Othman. September 17th to 23rd.*i.* ♀ imm. Al Khaur, Wadi Hassan, Abian Country. October 7th.

This is the first record of the Blue-headed Wagtail from South Arabia.

20. *Motacilla feldeggii*.*Motacilla feldeggii* Michah. ; Yerbury, *Ibis* 1896, p. 25.*a.* ♂ ad. Shaik Othman. September 20th.21. *Anthus trivialis*.*Anthus trivialis* (Linn.) ; Sharpe, *Cat. B. Brit. Mus.* x. p. 543 (1885).*a—e.* ♂ ad. Shaik Othman. September 17th to 23rd.

This is the first time the Tree Pipit has been recorded from Southern Arabia.

[Seen only in the irrigated gardens of Shaik Othman, where in company with various Wagtails it was fairly common.—A. B. P.]

22. *Nectarinia metallica*.*Nectarinia metallica* Licht. ; Yerbury, *Ibis* 1896, p. 25.*a—h.* ♀ ad. et ♂ ♀ imm. Jebel Manif, N. of Lahej. August 12th.*i.* ♂ imm. Shaka, N. of Lahej. August 28th.*k.* ♂ vix ad. Haithalhim, N. of Lahej. September 6th.*l.* ♀ ad. Lahej. September 2nd.

♂ imm. Iris, bill, and legs black.

♀ ad. Iris brown ; legs black. (A. B. P.)

I found this species common in the Goldmohur Valley near Aden, and shot several *females*. The adult *males* were very wild and difficult to approach, and the only specimen I succeeded in shooting after a morning's pursuit was lost among the volcanic debris with which the valley is strewn.

Mr. Percival found this species in all the wadis, especially in the more desolate ; he, too, found the *males* very wary and difficult to secure.

23. *Cinnyris habyssinica*.*Cinnyris habyssinica* (Hempr. & Ehr.) ; Gadow, *Cat. B. Brit. Mus.* ix. p. 52 (1884).*a.* ♀ ad. Jebel Manif, N. of Lahej. August 13th.*b.* ♂ imm. Ma'ir, Abian Country. October 14th.

This is the first time this Sunbird has been recorded from Southern Arabia.



24. *Cinnyris osea*.

*Cinnyris osea* Bonap. ; Gadow, *Cat. B. Brit. Mus.* ix. p. 53 (1884).

a. ♂ ad. Ma'ir, Abian Country. October 12th.

This is the first time this Sunbird has been recorded from Southern Arabia. The species was hitherto only known to occur in Palestine, so the above specimen indicates a considerable extension of its range.

[This Sunbird was not uncommon at Wadi Yeram in the Abian Country. It was extremely wary, and I only succeeded in obtaining one.—A. B. P.]

25. *Telephonus percivali*.

*Telephonus percivali* Grant ; *Bull. B. O. C.* lxix. p. 1 (1900).

♀. ♂ ad. Al Milah, N. of Lahej. August 16th. (*Type of the species.*)

*Adult male*.—Allied to *T. blanfordi* Sharpe, but somewhat smaller, the bill especially being less stout ; the foreneck, chest, and rest of the underparts much greyer, and the rufescent margin to the inner webs of the quills, so conspicuous in *T. blanfordi*, barely indicated. Iris brown ; bill black ; legs grey.

Total length 7·5 in. ; culmen 0·88 ; wing 3·0 ; tail 3·4 ; tarsus 1·2.

26. *Lanius fallax*.

*Lanius fallax* Finsch. ; Gadow, *Cat. B. Brit. Mus.* viii. p. 247. Pl. viii. (1883).

*Lanius* sp. inc. ; Yerbury, *Ibis* 1886, p. 16.

*Lanius lahtora* ; Yerbury (nec Sykes), *Ibis* 1896, p. 21 ; Hawker, *Ibis* 1898, p. 374.

a. ♀ ad. Jehel Manif, N. of Lahej. August 13th.

b. ♀ ad. Al Milah, N. of Lahej. August 16th.

c—f. ♂ ♀ ad. et imm. Shaik Othman. September 20th to 25th.

Iris black ; bill and legs grey. (A. B. P.)

There can be no doubt that this species has been wrongly identified in all the previous lists of South Arabia, for the specimens procured by Colonel Yerbury, Captain Nurse, and Mr. Hawker, all belong to *L. fallax*. The black secondaries tipped with white distinguish this species at a glance from *L. lahtora*, which has the inner secondaries largely mixed with white.

[Common near Lahej and Shaik Othman, but rarely seen in the Abian Country. —A. B. P.]

27. *Lanius nubicus*.

*Lanius nubicus* Licht ; Yerbury, *Ibis* 1896, p. 21.

a—c. ♀ ad. et ♂ imm. Al Khaur, Wadi Hassan, Abian Country, October 3rd to 9th.

Colonel Yerbury obtained a specimen of this Shrike at Lahej in January 1885. It appears to be an uncommon species in this locality, and was not obtained by Messrs. Percival and Dodson.

28. *Lanius isabellinus*.

*Lanius isabellinus* Hempr. & Ehr. ; Yerbury, *Ibis* 1896, p. 21.

(?) *L. speculigerus* Tacz ; Gadow, *Cat. B. Brit. Mus.* viii. p. 279 (1883).

I shot a fully adult male (a) in the neighbourhood of Shaik Othman, which exactly agrees with the description of typical *L. speculigerus* Tacz. (b). A somewhat younger bird, possibly a female (but the sex has not been determined), was

collected by Colonel Yerbury at Lahej, and evidently belongs to the same species as specimen (a), but the white speculum on the base of the primaries is obsolete, the ear-patch dark brownish, and the dark spot in front of the eye barely indicated.

I am inclined to believe that *L. speculigerus* Tacz is merely the fully adult of *L. isabellinus*.

- a. ♂ ad. Shaik Othman (W.R.O.G. and H.O.F.). Wing 3.9 in., tail 3.5.  
 b. Vix ad. Lahej (J. W. Yerbury) „ 3.85 „ „ 3.5.

The length of tail in the above specimens appears to be slightly longer than usual, the average measurement being 3.2 to 3.3 inches. This species was not obtained by Messrs. Percival and Dodson.

### 29. *Lanius collurio*.

*Lanius collurio* Linn.: Yerbury, *Ibis* 1896, p. 21.

- a. mm. Wadi Bana, Abian Country. September 29th.  
 b. Imm. Wadi Hassan, „ „ October 9th.

### 30. *Lanius phoenicuroides*.

*Lanius phoenicuroides* Severtz ; Gadow, *Cat. B. Brit. Mus.* viii. p. 278 (1883).

- a. ad. Shaik Othman. September 26th.  
 b. c. ♂ ad. et ♀ imm. Wadi Bana, Abian Country. September 29th.  
 d—g. ♂ ♀ imm. Al Kbaur, Wadi Hassan, Abian Country. October 2nd to 9th.

This Shrike is new to the fauna of Southern Arabia.

[At Shaik Othman this bird was only once seen, but in the Abian Country they were common near the water in Wadi Bana and Wadi Hassan.—A. B. P.].

### 31. *Hypocolius ampelinus*.

*Hypocolius ampelinus* Bonap. ; Barnes, *Ibis* 1883, p. 74 ; Yerbury, *Ibis* 1896, p. 21.

This species is said to have been seen by the late Mr. Barnes near Shaik Othman. No specimens, however, have been procured in the neighbourhood of Aden.

### 32. *Sylvia nisoria*.

*Sylvia nisoria* (Bechst.) ; Seebohm, *Cat. B. Brit. Mus.* v. p. 6 (1881).

- a. ♂ Ad. Al Kbaur, Wadi Hassan, Abian Country. October 7th.

This is the first record of the Barred Warbler in South Arabia.

### 33. *Sylvia atricapilla*.

*Sylvia atricapilla* (Linn.) ; Seebohm, *Cat. B. Brit. Mus.* v. p. 23 (1881).

- a. ♀ ad. Shaik Othman. September 26th.

This is the first record of the Blackcap in Arabia.

### 34. *Sylvia cinerea*.

*Sylvia cinerea* Bechst. ; Seebohm, *Cat. B. Brit. Mus.* v. p. 8 (1881).

- a—b. ♂ ♀ ad. Shaik Othman. September 25th and 26th.

The Whitethroat is recorded for the first time from South Arabia.

35. *Sylvia hortensis*.

*Sylvia hortensis* Bechst. ; Seebohm, *Cat. B. Brit. Mus.* v. p. 10 (1881).

a. Ad. Al Khaur, Wadi Hassan, Abian Country. October 9th.

This is the first time the Garden Warbler has been recorded from Southern Arabia.

36. *Aedon familiaris*.

*Sylvia familiaris* Ménétr. ; Seebohm, *Cat. B. Brit. Mus.* v. p. 36 (1881).

- a. ♂ ad. Jimil, north of Lahej. August 16th.
- b. ♂ ad. Al Milah „ „ August 16th.
- c. Ad. Shaka „ „ August 29th.
- d. Ad. Habil, Wadi Abrain, North-West Lahej. September 12th.
- e-h. ♂ ♀ ad. Lahej. 25th August and September 26th.
- i-k. Ad. Shaik Othman. September 26th.
- l, m. ♂ ♀ ad. Al Khaur, Wadi Hassan, Abian Country. October 3rd and 10th.

This Warbler has not previously been recorded from South Arabia.

Iris brown ; bill and legs flesh-colour. (A. B. P.)

37. *Parisoma blanfordi*.

*Sylvia blanfordi* ; Seebohm, *Cat. B. Brit. Mus.* v. p. 29 (1881) ; Salvadori, *Ann. Mus. Civ. Genov.* xxvi. p. 259 (1888) ; Chholmley, *Ibis* 1897, p. 203 ; Phillips, *Ibis* 1898, p. 407 ; Hawker, *Ibis* 1899, p. 69. *Parisoma blanfordi*. Grant, *Ibis* 1900, p. 154.

- a. ♂ ad. Jebel Manif, north of Lahej. August 13th.
- b. Ad. Ma'if, Abian Country. October 13th.

Iris brown ; bill and legs grey. (A. B. P.)

The occurrence of this rare Warbler in Southern Arabia is remarkably interesting. It was only known to occur in North-East Africa, and very few examples have found their way to this country. Up to the present time only five examples have been recorded. Mr. W. T. Blanford obtained the type at Rairo, Abyssinia ; then an example from Shoa was recorded by Count Salvadori. Subsequently the species was met with by Mr. A. Chholmley in the Erba Mountains, Snakim, and by Mr. E. Lort Phillips and Mr. R. McD. Hawker in Somali-land.

38. *Phylloscopus trochilus*.

*Phylloscopus* sp. inc. ; Barnes, *Ibis* 1893, p. 78 ; Yerbury, *Ibis* 1896, p. 25.

- a. (?) ♀ imm. Huswa, Bay of Aden. September 19th.
- b. ♂ ad. Shaik Othman. September 23rd.

Although the Willow Warbler had been observed both by Col. Yerbury and the late Mr. H. E. Barnes, this is the first time that examples have been procured.

39. *Phylloscopus sibilatrix*.

*Phylloscopus sibilatrix* (Bechst.) ; Seebohm, *Cat. B. Brit. Mus.* v. p. 54 (1881).

- a (?) ♀ ad. Shaik Othman. September 19th.

The Wood Wren is recorded for the first time from the neighbourhood of Aden.

40. *Acrocephalus turdoides*.

*Acrocephalus turdoides* (Meyer); Seebohm, *Cat. B. Brit. Mus.* v. p. 95 (1881).

*a* ♂. Shaik Othman, September 26th.

*b* ♀. Al Khaur, Wadi Hassan, Abian Country. October 10th.

This is the first record of this species from Arabia.

Iris hazel brown; upper mandible black, lower grey becoming whitish towards the base; legs slate. (A. B. P.)

41. *Hypolais pallida*.

*Hypolais pallida* (Hempr. & Ehr.); Seebohm, *Cat. B. Brit. Mus.* v. p. 82 (1881).

*a* ad. Shaik Othman. September 18th.

*b-d.* ♂ ♀ ad. Al Khaur, Wadi Hassan, Abian Country. October 3rd to 10th.

This Warbler, which had not hitherto been recorded from Aden, was obtained by Dr. H. O. Forbes and myself at Shaik Othman in November 1898. Specimens from the same locality and from the Abian Country are in the present collection.

42. *Hypolais languida*.

*Hypolais languida* (Hempr. & Ehr.); Seebohm, *Cat. B. Brit. Mus.* v. p. 80 (1881).

*a-c.* ♀ ad. Jebel Manif, N. of Lahej. August 13th.

*d.* ♂ ad. Al Milah, south of Jimil. August 14th.

*e.* ad. Mijba, north of Lahej. August 17th.

Iris brown; bill flesh-colour; legs light sage-green. (A. B. P.)

This is the first time this Warbler has been recorded from Arabia. The bastard primary is abnormally lengthened in specimen *d*, exceeding the primary coverts in length by 0.12 in. The bird from Al Milah, however, undoubtedly belongs to the present species; in the other four specimens the bastard primary is about equal in length to the primary coverts.

43. *Monticola cyanus*.

*Monticola cyanus* (Linn.); Yerbury, *Ibis* 1896, p. 22.

Said to be a regular winter visitant at Aden.

44. *Monticola saxatilis*.

*Monticola saxatilis* (Linn.); Seebohm, *Cat. B. Brit. Mus.* v. p. 313 (1881).

*a.* ♂ imm. Shaik Othman. September 20th.

*b. c.* ♂ imm. Al Khaur, Wadi Hassan, Abian Country. October 2nd to 6th.

The Rock Thrush had not hitherto been recorded from Aden.

[A solitary example of this Rock Thrush was shot at Shaik Othman; it was in very poor condition. A few were seen in the Abian hills.—A. B. P.]

45. *Ruticilla* sp. inc.

*Ruticilla* sp. inc.; Yerbury, *Ibis* 1896, p. 25.

Colonel Yerbury writes:—"A Redstart is a casual cold-winter visitant, but the exact species awaits identification; it will, however, in all probability be found to be *R. phoenicurus* or *R. mesoleuca*."



46. *Erithacus golzii*.

*Erithacus golzii* (Cab.) ; Seebohm, *Cat. B. Brit. Mus.* v. p. 297 (1881).

a. ♀ ad. Lahej. September 14th.

b—f. ♂ ♀ ad. Shaik Othman. September 17th–26th.

Iris brown ; bill and legs earthy brown. [A. B. P.]

The occurrence of this Nightingale in Southern Arabia is extremely interesting, as hitherto it was only known from Western Persia, Turkestan and the Caucasus. Its winter quarters were unknown.

47. *Burnesia gracilis*.

*Burnesia gracilis* (Cretzschm.) ; Yerbury, *Ibis* 1896, p. 25 ; Hawker, *Ibis* 1898, p. 375.

a. ♂ ad. Shaka, N. of Lahej. August 13th.

b—f. ♂ ♀ ad. Lahej. August 22nd to September 14th.

g. ♂ ad. Shaik Othman. September 26th.

Iris orange (yellowish in the female) ; bill dark grey ; legs flesh-colour. (A. B. P.)

48. *Prinia* sp. inc.

*Prinia* sp. inc. ; Barnes, *Ibis* 1893, p. 78 ; Yerbury, *Ibis* 1896, p. 25.

Colonel Yerbury writes :—" A nest of a species of *Prinia* was found at Shaik Othman on February 24th, 1895, containing four brick-red eggs."

It seems to me possible that the eggs found may have been those of *Burnesia gracilis*, a very common species in that neighbourhood.

49. *Cisticola cisticola*.

*Cisticola cisticola* (Temm.) ; Yerbury, *Ibis* 1896, p. 25.

a—c. ♂ ♀ ad. Lahej. August 23rd to September 2nd.

[Iris pale yellow ; bill flesh-colour, brownish towards the tip ; legs flesh-colour. Common among low bushes, particularly between Shaik Othman and Lahej. A. B. P.]

50. *Saxicola œnanthe*.

*Saxicola œnanthe* Linn. ; Barnes, *Ibis* 1893, p. 76 ; Yerbury, *Ibis* 1896, p. 24.

a. ♂ imm. Shaka, north of Lahej. August 31st.

b. ♂ imm. Shaik Othman. September 21st.

Iris, bill and legs black. (A. B. P.).

51. *Saxicola deserti*.

*Saxicola deserti* Temm. ; Yerbury, *Ibis* 1896, p. 24.

*Saxicola stapazina* Yerbury ; (nec Vieill.) ; *Ibis* 1896, p. 17 ; Barnes, *Ibis* 1893, p. 76.

a. ♂ ad. Lahej. September 6th.

b—c. ♂ ad. Habil, Wadi Abraïn, N.W. of Lahej. September 12th.

52. *Saxicola isabellina*.

*Saxicola isabellina* (Cretzschm.) ; Yerbury, *Ibis* 1896, p. 24.

a. (?) ♂ ad. Huswa, Bay of Aden. September 20th.

b—d. ♀ ad. Shaik Othman. September 25th.

e. (?) ♂ ad. Habil, Wadi Abraïn, N.W. of Lahej. September 13th.

[This and the two preceding species of Chat were obtained on the cultivated land round Shaik Othman and Lahej, and were very seldom seen near open desert.—A. B. P.]

53. *Saxicola pleschanka*.

*Saxicola pleschanka* (Lepech.); Barnes, *Ibis* 1893, p. 76; Yerbury, *Ibis* 1896, p. 24.

a. ♂ ad. Wadi Bana, Abian Country. September 29th.

b. ♀ ad. Al Khaur, Wadi Hassan, Abian Country. October 5th.

This Chat was first observed by the late Mr. Barnes, in the neighbourhood of Aden, but no example was obtained. Any doubt that may have been felt about the occurrence of this species in Southern Arabia is now satisfactorily set at rest.

54. *Saxicola lugentoides*.

*Saxicola lugentoides* Seebohm; *Cat. B. Brit. Mus.* v. p. 371 (1881).

a. [♂] ad. Ma'ir, Abian Country. October 13th.

The occurrence of this rare Chat in S. Arabia is a matter of considerable interest. It was only known to inhabit Sennar, North-East Africa, where it was supposed to be a resident.

55. *Myrmecocichla melanura*.

*Myrmecocichla melanura* (Temm.); Yerbury, *Ibis* 1886, p. 17; Barnes, *Ibis* 1893, p. 77; Yerbury, *Ibis* 1896, p. 24, pl. 1. fig. i.

a—c. ♂ ♀ ad. Jebel Manif, north of Lahej. August 13th and 14th.

f. Ad. Al Khaur, Wadi Hassan, Abian Country. October 10th.

g—h. Ad. Ma'ir, Abian Country. October 13th.

[Iris, bill and legs black.

Common about the foothills of Jebel Manif, in rough wadis and in the crater at Aden.—A. B. P.]

56. *Cercotrichas melanoptera*.

*Cercotrichas melanopterus* (H. & E.); Yerbury, *Ibis* 1896, p. 23.

a—m. ♂ ♀ ad. et imm. Lahej. September 2nd to 15th.

n. ♂ ad. Jebel Manif, north of Lahej. August 14th.

o—p. ♂ ♀ ad. Al Khaur, Wadi Hassan, Abian Country. October 2nd to 10th.

[Iris brown; bill black; legs grey.

Very common in the low bushes of the desert; they are, however, not very easy to shoot, owing to their habit of slipping out of the opposite side of the bush. They are very pugnacious, and remind one of the Robin. Most of my birds were obtained in the evening, when they were feeding round the bushes.—A. B. P.]

57. *Argya squamiceps*.

*Argya squamiceps* (Cretzschm.); Yerbury, *Ibis* 1896, p. 23; Hawker, *Ibis* 1898, p. 375.

a—g. ♂ ♀ ad. Lahej. August 20th to September 15th.

[♂ Iris pale orange or raw-sienna; bill and legs pale greenish yellow.

♀ Iris brown; bill and legs greenish yellow.

The Babbling Thrush is extremely common in the Lahej district, and is always found in flocks, which keep low down among the bushes or on the ground. This species is very noisy, especially if there are Jackals or other vermin about, hence they are usually known as Jackal birds.—A. B. P.]

58. *Pycnonotus arsinoe*.*Pycnonotus arsinoe* (H. & E.); Yerbury, *Ibis* 1896, p. 23.

I found this Bulbul common in the Goldmohur Valley, and procured several examples.

59. *Pycnonotus xanthopygus*.*Pycnonotus xanthopygus* (H. & E.); Yerbury, *Ibis* 1896, p. 23; Hawker, *Ibis* 1898, p. 375.

- a.* ♀ ad. Jebel Manif, N. of Lahej. August 13th.  
*b—c.* ♂ ♀ ad. Lahej. September 8th.  
*d.* ♀ ad. Huswa, Bay of Aden. September 19th.  
*e—f.* ad. Ma'ir, Abian Country. October 13th.

60. *Muscicapa grisola*.*Muscicapa grisola* (L.); Barnes, *Ibis* 1893, p. 74.

- a—i.* ♂ ♀ ad. et imm. Shaik Othman. September 17th to 23rd.  
*k.* ad. Huswa, Bay of Aden. September 19th.

[Very common in irrigated gardens at Shaik Othman.—A. B. P.]

61. *Terpsiphone cristata*.*Terpsiphone cristata* (Linn.); Yerbury, *Ibis* 1896, p. 22.

- a—b.* ♀ imm. Lahej. September 6th and 8th.

Iris black; bill and legs slate. (A. B. P.)

62. *Hirundo rustica*.*Hirundo rustica* Linn.; Yerbury, *Ibis* 1896, p. 22.

Appears to be a rare visitor to Aden.

63. *Cotile obsoleta*.*Ptilonoprogne obsoleta* (Cah.); Yerbury, *Ibis* 1896, p. 22.

I saw several of this species flying about the rocks in the Goldmohur Valley at Aden, and obtained a specimen.

64. *Cotile riparia*.*Cotile riparia* Sharpe, *Cat. B. Brit. Mus.* x. p. 96 (1885).

- a.* ♂ ad. Shaik Othman. September 26th.

The Sand Martin had not previously been recorded from South Arabia.

65. *Iynx torquilla*.*Iynx torquilla* Linn.; Hargitt, *Cat. B. Brit. Mus.* xviii. p. 560 (1890).

- a.* ♂ ad. Shaik Othman. September 23rd.

Iris brown; bill brown; legs dirty sage-green. (A. B. P.)

The Wryneck is recorded for the first time from Southern Arabia.

66. *Coccystes jacobinus*.*Coccystes jacobinus* (Bodd.); Yerbury, *Ibis* 1896, p. 20.

Examples of this Cuckoo have been obtained by Colonel Yerbury and Captain Nurse.

67. *Cuculus canorus*.*Cuculus canorus* Linn. ; Barnes, *Ibis* 1893, p. 72.

- a.* ♀ vix ad. [wing 8·3 in.] Hail, Wadi Abrain, N.W. of Lahej. September 12th.  
*b.* [♀] ad. [wing 7·8 in.] Lahej. September 5th.  
*c—e.* ♂ ♀ imm. [wing 8·0—8·2 in.]. Shaik Othman. September 15th to 24th.

Specimen *b* of the above list appears to be a very old *female* ; the foreneck and chest are nearly uniform dull rufous, the latter with a few very narrow dark bars ; a wide collar of feathers surrounding the back of the neck is barred with the same rufous colour, and the black bars across the feathers of the breast and sides are very narrow.

Specimen *a* is altogether a younger bird, with the foreneck and chest marked with buff and rather widely barred with black ; as in specimen *b*, there is a wide collar of rufous barred feathers round the back of the neck.

The first record of the occurrence of this species at Aden is found in Mr. Barnes' paper ; subsequently, in November 1898, I shot an immature bird near Shaik Othman.

68. *Centropus superciliosus*.*Centropus superciliosus* (H. & E.) ; Yerbury, *Ibis* 1896, p. 20.

- a—b.* ♂ ♀ imm. Lahej. August 20th to September 14th.  
*c—d.* ♀ ad. Al Khaur, Wadi Hassan, Abian Country. October 8th.

[♂ Iris brown ; bill black ; legs slate.

♀ Iris pale yellow ; bill black, grey at gape ; legs bluish grey.

Not uncommon, but difficult to see or shoot ; it was very noisy at night and in the early morning.—A. B. P.]

69. *Cypselus melba*.*Cypselus melba* (Linn.) ; Yerbury, *Ibis* 1896, p. 17.70. *Cypselus affinis*.*Cypselus affinis* Hardw. ; Yerbury, *Ibis* 1896, p. 18

- a.* Ad. Ma'ir, Abian Country. October 14th.

[Very common near Ma'ir and in the hills around.—A. B. P.]

71. *Caprimulgus nubicus*.*Caprimulgus nubicus* Licht. ; Yerbury, *Ibis* 1896, p. 18.

- a—c.* ♂ ad. Wadi, near Lahej. August 22nd to 24th.  
*d—f.* ♂ ad. et imm. Shaik Othman. September 23rd to 24th.

Iris black ; bill flesh-colour, black at tip ; legs bluish pink. (A. B. P.)

As all the adult birds are sexed *male*, there is no further evidence as to whether the *female* differs in plumage or not.

[Most of the Nightjars were found in the wadis, and were usually put up when we were walking or riding through ; they were fairly numerous ; a few were seen at Shaik Othman, hawking round the outside of the gardens.—A. B. P.]



72. *Caprimulgus inornatus*.

*Caprimulgus inornatus* Heugl. ; Hartert, *Cat. B. Brit. Mus.* xvi. p. 556 (1892).

a.	imm.	Shaka, N. of Lahej. August 29th.
b.	♂ imm.	Lahej. September 14th.
c—e.	♀ ad. et imm.	Shaik Othman. September 17th to 23rd.
f—g.	♂ ♀ imm.	Al Khaur, Abian Country. October 1st to 5th.

Out of the seven specimens collected, five (including three adults of both sexes) belong to the rufous form, while two immature birds have the upper parts brownish grey. There can be no doubt that the difference in colour of the upper parts has nothing to do with either age or sex, but is purely individual.

The rufous form from Arabia exactly resembles the immature type of *C. cinna-momeus* Sharpe from Lagos, which Mr. Hartert has already shown to be identical with *C. inornatus*.

This is the first time this North-East African species has been recorded from Southern Arabia.

73. *Merops cyanophrys*.

*Merops cyanophrys* (Cab. & Heine) ; Yerbury, *Ibis* 1896, p. 19.

a—f.	♂ ♀ ad. et imm.	Lahej. August 19th to September 3rd.
g—i.	♂ ad.	Shaik Othman. September 17th to 21st.

Total length 8·0 inches ; iris carmine ; bill black ; legs greyish black. (A. B. P.)

74. *Merops albicollis*.

*Merops* sp. incert. ; Barnes, *Ibis* 1893, p. 71 ; Yerbury, 1896, p. 19.

a—e.	Ad. et imm.	Jimil, N. of Lahej. August 16th.
f.	♀ imm.	Jebel Manif, N. of Lahej. August 12th.
g—h.	♂ imm.	Shaka, N. of Lahej. August 28th.
i—n.	♂ ♀ imm.	Lahej. August 19th and 20th.

This is the first time this Bee-eater has been met with outside Africa ; it is no doubt the third species mentioned by both Colonel Yerbury and the late Mr. Barnes.

75. *Merops persicus*.

*Merops persicus* Pall. ; Yerbury, *Ibis* 1896, p. 19 ; Hawker, *Ibis* 1898, p. 374.

Not obtained by the Percival-Dodson Expedition. Captain Nurse procured it on November 14th, at Aden. Colonel Yerbury records it from Shaik Othman on March 4th, and from Lahej, March 12th. Mr. Hawker obtained two males at Lahej on October 25th.

76. *Upupa epops*.

*Upupa epops* Linn. ; Yerbury, *Ibis* 1896, p. 20.

a.	♂ ad.	Jebel Manif, N. of Lahej. August 14th.
b—c.	♂ ♀ ad.	Shaka. August 28th.
d—e.	♂ ♀ ad.	Shaik Othman. September 21st and 22nd.
f.	Ad.	Al Khaur, Wadi Hassan, Abian Country. October 8th.

Iris black ; bill black at tip, flesh-colour at the base ; legs grey. (A. B. P.)

77. *Lophoceros nasutus*.

*Lophoceros nasutus* (Linn.) ; Grant, *Cat. B. Brit. Mus.* xvii. p. 406 (1892).

- a.* ♂ ad.                      Jebel Manif, N. of Lahej.    August 13th.  
*b—c.* ♂ ad. et imm.        Wadi Bana, Abian Country.    September 29th.  
*d—e.* ♀ ad. et ♂ imm.    Al Khaur, Wadi Hassan, Abian Country.    October 2nd.

♂ Iris orange ; bill black and white ; legs black. (A. B. P.)

The occurrence of this little Hornbill in Southern Arabia will no doubt surprise many ornithologists, but it must not be forgotten that the type of *Buceros forskalii* (which is synonymous with *L. nasutus*) was described by Hemprich and Ehrenberg from that country. In the Catalogue of Birds quoted above, S. Arabia has been accidentally omitted in giving the geographical range of the species.

[The Hornbill was first seen near Jebel Manif, but there it was not common, and very difficult to shoot. In the Abian Country, particularly near Al Khanr, it was seen feeding in hundreds on a yellow fruit which was common along the irrigation canal. Almost all the birds seen were black-billed *males*, and only one *female* was obtained.—A. B. P.]

78. *Halcyon semicærulea*.

*Halcyon semicærulea* (Forsk.) ; Yerbury, *Ibis* 1896, p. 20.

- a—n.* ♂ ♀ ad. et imm.    Lahej.    August 11th and September 14th.  
*o—p.* ♀ ad. et imm.        Al Milah, N. of Lahej.    August 14th to 16th.  
*q—s.* ♂ ad. et imm.        Al Khaur, Wadi Hassan, Abian Country.    October 3rd.

Iris brown ; bill scarlet-vermilion ; legs vermilion. (A. B. P.)

The above series illustrates fully the interesting changes of plumage which intervene between the young bird and the fully adult. Birds in the first plumage are easily distinguished by the short blackish bill, pale buff chest with the feathers fringed with blackish ; by the white breast and belly ; and by having the outer webs of the quills greenish blue instead of deep cobalt. Besides these, there are several birds in intermediate stages, with the bill scarlet as in the adult. Of these : (*a*) has the breast and belly nearly pure white, only one pale chestnut feather having made its appearance ; (*b*) has several chestnut feathers ; and (*c*) has a patch of deep chestnut feathers on each side of the breast.

[Common in the palm-groves round Lahej, but we did not meet with many elsewhere.—A. B. P.]

79. *Coracias garrulus*.

*Coracias garrula* Linn. ; Yerbury, *Ibis* 1896, p. 19.

- a.* ♂ imm.    Shaik Othman.    September 25th.  
*b.* ♂ ad.        Wadi Bana, Abian Country.    September 29th.

80. *Coracias abyssinicus*.

*Coracias abyssinicus* Bodd ; Yerbury, *Ibis* 1886, p. 15 ; Barnes, *Ibis* 1893, p. 72 ; Yerbury, *Ibis* 1896, p. 20.

No example of this bird was obtained.

81. *Carine* sp. inc.

*Carine* sp. inc. ; Barnes, *Ibis* 1893, p. 68 ; Yerbury, *Ibis* 1896, p. 17.

The species still remains doubtful. Mr. Percival shot an example while returning from the disastrous trip to the Abian Country, but was too ill to preserve it.

82. **Scops giu.**

*Scops giu* (Scop.) ; Barnes, *Ibis* 1893, p. 68.

A single specimen obtained by the late Mr. Barnes proved to belong to this species.

83. **Asio accipitrinus.**

*Asio accipitrinus* (Pall.) ; Yerbury, *Ibis* 1896, p. 17.

An example of the Short-eared Owl was obtained by Mr. Chevallier.

84. **Bubo milesi.**

*Bubo milesi* ; Sharpe, *Ibis* 1886, p. 163, pl. vi. ; Yerbury, *Ibis* 1896, p. 16.

a. ♀ ad. Shaik Othman. September 17th.

[Iris lemon-yellow ; bill black ; gape light grey.

We saw several of these owls at Shaik Othman, and obtained one of them.—  
A. B. P.]

85. **Strix flammea.**

*Strix flammea* Linn. ; Yerbury, *Ibis* 1896, p. 16.

a. ♀ ad. Lahej. August 24th.

b. ♀ ad. Haithalhim, near Lahej. September 7th.

[Iris black ; bill white ; legs dirty flesh-colour.

The Barn-Owl was met with in the caves in the banks of the Wadi Saghir and about Haithalhim.—A. B. P.]

86. **Pandion haliaëtus.**

*Pandion haliaëtus* (Linn.) ; Yerbury, *Ibis* 1896, p. 16.

87. **Falco peregrinus.**

*Falco peregrinus* ; Barnes, *Ibis* 1893, p. 64.

Barnes reports the occurrence of this species, but as no specimen was procured, its identity is by no means established.

88. **Falco barbarus.**

*Falco barbarus* Linn. ; Barnes, *Ibis* 1893, p. 64.

*Falco puniceus* ; Yerbury (nec le Vaill.), *Ibis* 1896, p. 16.

a—c. ♂ ad. et ♂ ♀ imm. Lahej. August 12th to September 1st.

d. Imm. Haithalhim, near Lahej. September 6th.

[*Adult* : Iris brown ; bill grey ; cere greenish yellow ; legs lemon or Indian yellow.

*Immature* : Iris hazel ; bill and feet slate.

This species is common in the Wadi Saghir.—A. B. P.]

Dr. Sharpe's original identification of the *female* specimen obtained by the late Mr. Barnes near Lahej was undoubtedly correct, and the late Lord Lilford was certainly mistaken in referring the same specimen to *F. puniceus*.

89. *Falco feldeggii*.*Falco feldeggii* Schl. ; Hawker, *Ibis* 1898, p. 374.*a—b.* ♂ ♀ imm. Wadi Saghir, Lahej. September 1st, 1899.

[♀ Bill slate ; cere and skin round eye slate-grey ; feet very light greenish grey.

Both this and the previous species are not uncommon in the various wadis near Lahej, but they were never met with in the Abian Country. They were usually found in pairs.

Most of our specimens were obtained at the cave where we obtained the smaller Fruit-bats. When any one entered the cave numbers of Bats at once flew out, and were promptly pounced on by one or other of these Falcons. On several occasions we saw Falcons hawking at dusk, and I think they were in search of Bats.—A. B. P.]

90. *Cerchneis tinnunculus*.*Cerchneis tinnunculus* (Linn.) ; Sharpe, *Cat. B. Brit. Mus.* i. p. 425 (1874).*Tinnunculus alaudarius* (Daud.) ; Yerbury, *Ibis* 1893, p. 16.*a—b.* ♂ ♀ ad. Lahej. September 7th and 8th.*c—d.* ♂ ♀ ad. Al Khaur, Wadi Hassan, Abian Country. October 2nd.

[♂ Iris black ; bill greyish yellow, gape orange ; legs orange.

Rare in the low country, but not uncommon amongst the Abian hills.—A. B. P.]

91. *Milvus ægyptius*.*Milvus ægyptius* (Gmel.) ; Yerbury, *Ibis* 1896, p. 15.*a—b.* Imm. Lahej. August 25th.

Young birds have the culmen entirely black. One of the specimens shot by myself at Shaik Othman has the bill yellow, the terminal part of the culmen blackish.

[Egyptian Kites were extremely numerous around the town of Lahej, particularly near our quarters, the bodies of the birds we threw out being the attraction. I do not think they are quite as bold here as the Kites in British Central Africa. On the Ruo River in B. C. Africa I lost more than one specimen, a Kite shooting past me as I walked towards a dead bird, and taking it before my eyes.

Among the Bedouins of Dethina and further to the north-east, where lances are used, the following plan for the destruction of Kites is sometimes employed. A long sharp lance or lance tip is fixed in a recess among mimosa bushes, and on it a piece of meat is fixed, so that a Kite stooping at the meat either transfixes itself or is so much cut as to be easily caught or killed.—A. B. P.]

92. *Elanus cœruleus*.*Elanus cœruleus* (Desf.) ; Yerbury, *Ibis* 1896, p. 15.*a.* ♂ ad. Shaka, N. of Lahej. August 30th.

[Rare.—A. B. P.]\*

\* *Haliaëtus leucogaster*.*Haliaëtus leucogaster* (Gmel.) ; Barnes, *Ibis* 1893, p. 66.

Barnes reports having seen what he believed to be an immature bird of this species. I entirely agree with Colonel Yerbury in thinking that it is most improbable that the White-bellied Sea-Eagle occurs near Aden.



93. *Aquila chrysaëtus*.

*Aquila chrysaëtus* (Linn.) ; Barnes, *Ibis* 1893, p. 65 ; Yerbury, *Ibis* 1896, p. 15.

The occurrence of the Golden Eagle at Aden rests on the observations of Colonel Yerbury and the late Mr. Barnes ; no example was procured.

94. *Aquila imperialis*.

*Aquila imperialis* (Bechst.) ; Barnes, *Ibis* 1893, p. 66.

The authority for the occurrence of this species rests on the observations of the late Mr. Barnes. The species was not met with by Colonel Yerbury, myself, or Messrs. Percival and Dodson.

95. *Accipiter nisus*.

*Accipiter nisus* (Linn.) ; Yerbury, *Ibis* 1896, p. 15.

Colonel Yerbury obtained a *male* at Lahej.

96. *Melierax polyzonus*.

*Melierax polyzonus* (Rupp.) ; Yerbury, *Ibis* 1896, p. 15 ; Hawker, *Ibis* 1898, p. 374.

<i>a—e.</i>	ad. et imm.	Lahej.	August 19th to 23rd.
<i>f.</i>	ad.	Lahej.	September 3rd.
<i>g.</i>	imm.	Sbaka, N. of Lahej.	August 28th.
<i>h.</i>	♂ imm.	Habil, Wadi Abaiu.	September 13th.
<i>i—k.</i>	♂ ad. et imm.	Al Khaur, Wadi Hassan, Abian Country.	October 2nd and 3rd.

[*Adult*.—Iris brown ; bill grey ; cere and gape orange ; legs orange.

*Immature*.—Iris yellow or lemon-yellow ; bill light grey at base, dark grey at extremity, gape orange or yellow ; legs yellowish to light orange.

The Chanting Goshawk has a habit of perching at the end of a dead branch or on top of a stump. It is a slow flier and very easy to approach. Its food consists of insects and reptiles.—A. B. P.]

97. *Circus pygargus*.

*Circus pygargus* (Linn.) ; Sharpe, *Cat. B. Brit. Mus.* i. p. 64 (1874).

*a.* ♀ imm. Al Khaur, Wadi Hassan, Abian Country. October 7th.

This is the first time Montague's Harrier has been recorded from Arabia.

[A few examples were found in the neighbourhood of Wadi Abrain, but they were difficult to shoot. At Al Khaur several were seen near our camp, sailing quietly about in the early morning and evening.—A. B. P.]

98. *Circus macrurus*.

*Circus macrurus* (S. G. Gmel.) ; Yerbury, *Ibis* 1896, p. 15.

I have examined an immature *male* obtained by Colonel Yerbury in the neighbourhood of Lahej.

99. *Circus æruginosus*.

*Circus æruginosus* (Linn.) ; Sharpe, *Cat. B. Brit. Mus.* i. p. 69 (1874).

*a.* Imm. Al Khaur, Wadi Hassan, Abian Country. October 2nd.

Iris brown ; bill black ; cere and gape grey ; legs lemon-yellow. (A. B. P.)

This is the first time the Marsh Harrier has been met with in Arabia. The immature example procured was the only one met with during Messrs. Percival and Dodson's stay in Southern Arabia.

100. **Vultur monachus.**

*Vultur monachus*, Linn. ; Yerbury, *Ibis* 1896, p. 14.

One captured at Aden is living at the present time in the Zoological Society's Gardens.

101. **Neophron percnopterus.**

*Neophron percnopterus* (Linn.) ; Yerbury, *Ibis* 1896, p. 14.

*a.* Imm. Lahej. September 5th.

102. **Pelecanus onocrotalus.**

*Pelecanus onocrotalus* Linn. ; Barnes, *Ibis* 1893, p. 179 ; Yerbury, *Ibis* 1896, p. 40.

103. **Phalacrocorax nigrogularis.**

*Phalacrocorax* sp. incert. ; Yerbury, *Ibis* 1886, p. 24 ; Barnes, *Ibis* 1893, p. 179 ;  
Yerbury, *Ibis* 1896, p. 39.

*Phalacrocorax nigrogularis* Grant & Forbes, *Bull. Liverpool Mus.* ii. p. 3 (1899).

I did not meet with this species during either of our visits to Aden, but there can be little doubt that the bird recorded by both Colonel Yerbury and the late Mr. Barnes belongs to the same species as that met with by Dr. Forbes and myself off Cape Guardafui and off the coast of the islands of Abd-el-kuri and Sokotra. The black birds are the adults, and the brown, birds in the second year.

104. **Sula sula.**

*Sula fiber* (G. R. Gray) ; Yerbury, *Ibis* 1896, p. 40.

105. **Phaethon indicus.**

*Phaethon indicus* Hume ; Yerbury, *Ibis* 1896, p. 40.

106. **Anas boscas.**

*Anas boscas* Linn. ; Barnes, *Ibis* 1893, p. 174.

Mr. Barnes records the Mallard as having been seen near Hnswa.

107. **Dafila acuta.**

*Dafila acuta* (Linn.) ; Hawker, *Ibis* 1898, p. 376.

108. **Nettion crecca.**

*Querquedula crecca* (Linn.) ; Yerbury, *Ibis* 1896, p. 39.

109. **Querquedula ciria.**

*Querquedula ciria* (Linn.) ; Barnes, *Ibis* 1893, p. 174.

*a.* ♀ ad. Al Khaur, Wadi Hassan, Abian Country. October 7th.

[Two pairs of the Garganey Teal were seen near Al Khaur.—A. B. P.]

110. *Spatula clypeata*.

*Spatula clypeata* (Linn.) ; Yerbury, *Ibis* 1896, p. 39.

a. ♂ ad. Al Khaur, Wadi Hassan, Abian Country. October 9th.

[Several Shovellers were seen at Shaik Othman, near Lahej, and in the Abian Country. They were very tame.—A. B. P.]

111. *Phœnicopterus roseus*.

*Phœnicopterus roseus* Linn. ; Yerbury, *Ibis* 1896, p. 38.

A cold-weather visitor.

112. *Platalea leucorodia*.

*Platalea leucorodia* Linn. ; Yerbury, *Ibis* 1896, p. 38.

A rare winter visitor.

113. *Scopus umbretta*.

*Scopus umbretta* Gmel. ; Yerbury, *Ibis* 1896, p. 38.

a—c. ♂ ad. Haithalhim, N. of Lahej. September 6th and 7th.

[Was common near Haithalhim.—A. B. P.]

114. *Abdimia abdimii*.

*Ciconia abdimii* Licht. ; Yerbury, *Ibis* 1896, p. 38.

a. Ad. Haithalhim, N. of Lahej. September 7th.

Iris brown ; bill dark brown ; naked skin on face pink ; legs brown and pink.  
(A. B. P.)

115. *Ciconia ciconia*.

*Ciconia ciconia* (Linn.) ; Sharpe, *Cat. B. Brit. Mus.* xxvi. p. 299 (1898).

a—b. ♀ ad. Habil, N.W. of Lahej. September 10th.

The White Stork has not previously been recorded from Southern Arabia.  
[A large flock was seen at Habil, and a pair shot.—A. B. P.]

116. *Ardea cinerea*.

*Ardea cinerea* Linn. ; Barnes, *Ibis* 1893, p. 173 ; Yerbury, *Ibis* 1896, p. 37.

a. ♀ imm. Shaik Othman. September 24th.

b. Vix ad. Al Khaur, Wadi Hassan, Abian Country. October 16th.

[Hérons were fairly common along the Wadis in Abian.—A. B. P.]

117. *Phoyx purpurea*.

*Phoyx purpurea* (Linn.) ; Sharpe, *Cat. B. Brit. Mus.* xxvi. p. 60 (1898).

a. ♀ imm. Al Khaur, Wadi Hassan, Abian Country. October 4th.

The Purple Heron has not previously been recorded from Southern Arabia.

118. *Herodias alba*.

*Ardea alba* Linn. ; Barnes, *Ibis* 1893, p. 173.

119. **Leptorodias asha.**

*Ardea asha* Sykes ; Barnes, *Ibis* 1893, p. 173.

*Ardea gularis* ; Yerbury (nec Bosc.), *Ibis* 1896, p. 37.

Colonel Yerbury doubted the occurrence of *L. asha* at Aden, and was of opinion that the bird obtained by the late Mr. Barnes would prove to be *L. gularis*.

Dr. Forbes and I, however, obtained a specimen which undoubtedly belongs to the present species, and proves that Barnes' identification was quite correct.

120. **Garzetta garzetta.**

*Garzetta garzetta* (Linn.) ; Sharpe, *Cat. B. Brit. Mus.* xxvi. p. 118 (1898).

Dr. Forbes and I obtained an adult *male* of this species from a flock feeding on the coast near Huswa ; with them were a number of *Leptorodias asha*, one of which was also secured.

121. **Ardeola ralloides.**

*Ardeola ralloides* (Scop.) ; Sharpe, *Cat. B. Brit. Mus.* xxvi. p. 202 (1898).

♀ imm. Shaik Othman. September 18th.

Iris lemon-yellow ; legs sage-green. (A. B. P.)

This species has not previously been recorded from Southern Arabia.

122. **Bubulcus lucidus.**

*Ardea bubulcus* Andouin ; Yerbury, *Ibis* 1896, p. 37.

*a-d.* ♂ ♀ ad. Lahej. August 20th to September 4th.

[♀ Iris pale yellow ; bill orange ; legs pale yellow.

This Egret is very common in and around Lahej, breeding in trees on the market place in hundreds. When we visited the Heronry we found both fresh eggs and young birds in all stages of development.—A. B. P.]

123. **Ardetta podiceps.**

*Ardetta podiceps* (Bonap.) ; Barnes, *Ibis* 1893, p. 173 ; Yerbury, *Ibis* 1896, p. 37.

*a.* ♀ ad. Shaik Othman. September 22nd.

*b-c.* Imm. Al Khaur, Wadi Hassan, Abian Country. October 5th to 7th.

[Several seen in Wadi Hassan.—A. B. P.]

124. **Butorides brevipes.**

*Ardea brevipes* ; Hempr. & Ehr. Hartl. *P.Z.S.* 1881, p. 959.

*Butorides brevipes* ; Sharpe, *Cat. B. Brit. Mus.* xxvi. p. 278 (1898).

Riebeck obtained this species at Bolhaf, and there are three examples from Aden in the British Museum Collection, collected by Capt. H. J. Kelsall.

125. **Ædicnemus dodsoni.**

*Ædicnemus dodsoni* ; Grant *Bull. B. O. C.* No. lxvi. p. xix. (1899).

*Ædicnemus scolopax* ; Barnes (nec S. G. Gmel.) *Ibis* 1893, p. 169 ; Yerbury, *Ibis*, 1896, p. 34.

♂ ad. Lahej. August 24th (*Type of the species*).

This Thick-knee is most nearly allied to *Æ. affinis* (Rüpp.), but with the ground-colour of the interscapular region largely mixed with greyish buff, while the deep

black markings, so conspicuous in the latter species, are reduced to shaft stripes. The greater and median wing-coverts are altogether greyer, the chest and breast more heavily streaked with brownish black, and the middle pair of tail-feathers as well as the outer webs of the two following pairs are mostly grey with indistinct blackish vermiculations and cross-bars. Iris lemon-yellow; bill lemon-yellow, black at the tip; legs lemon-yellow.

Total length about 14·5 in., culmen from feathers on forehead to tip 1·4; wing 8·6; tail 4·9; tarsus 3·4.

[Dodson's Thick-knee is not uncommon in the sandy wadis where *Eupodotis arabs* occurs, and resembles that species in its habits of crouching, but it allows one to come within a few yards before rising.—A. B. P.]

### 126. *Eupodotis arabs*.

*Eupodotis arabs* (Linn.); Yerbury, *Ibis* 1896, p. 32.

a. ♀ ad. Shaka, N. of Lahej. August 30th.

b. ♀ ad. Habil, Wadi Abraïn, N.W. of Lahej. September 10th.

[This fine bird is not uncommon in the sandy wadis. It is usually seen in pairs and is very difficult to approach on foot, but on a camel one can usually get a shot by riding round the bird in a circle as it crouches on the ground, for it then allows one to approach within 30 or 40 yards before rising. The early morning, when the birds are feeding, is the only time to look for them. The female from Shaka had two three-parts-grown young with her, but we were only able to bag the old one.—A. B. P.]

### 127. *Houbara macqueeni*.

*Houbara macqueeni* (J. E. Gray); Yerbury, *Ibis* 1896, p. 33.

Both Colonel Yerbury and the late Mr. Barnes believe this species to occur in Southern Arabia, but, so far, no example has been procured.

### 128. *Cursorius* sp. inc.

*Cursorius* sp. inc.; Yerbury, *Ibis* 1896, p. 33.

Up to the present time the Courser found in Southern Arabia has not been identified, but the species will probably prove to be *C. gallicus*. The examples shot by Mr. Chevallier near Aden do not appear to have been identified.

### 129. *Arenaria interpres*.

*Streptopelia interpres* (Linn.); Yerbury, *Ibis* 1896, p. 34.

*Arenarius interpres*; Sharpe, *Cat. B. Brit. Mus.* xxiv. p. 92 (1896).

### 130. *Hæmatopus ostralegus*.

*Hæmatopus ostralegus* (Linn.); Yerbury, *Ibis* 1896, p. 34.

The specific identity of this species still remains somewhat doubtful; for, though common along the harbour, no specimens have been procured.

### 131. *Squatarola helvetica*.

*Squatarola helvetica* (Linn.); Yerbury, *Ibis* 1896, p. 23.

a. Ad. Aden Harbour. September 21st.



132. *Charadrius pluvialis*.

*Charadrius pluvialis* (Linn.) ; Yerbury, *Ibis* 1896, p. 33.

Said to be a cold-weather visitor.

133. *Ochthodromus pyrrhothorax*.

*Ægialitis mongolicapud* Barnes, (nec Pall.), *Ibis* 1893, p. 169 ; Yerbury, *Ibis* 1896, p. 34  
*Ochthodromus pyrrhothorax* (Gould) ; Sharpe, *Cat. B. Brit. Mus.* xxiv. p. 226 (1896).

134. *Ochthodromus geoffroyi*.

*Ochthodromus geoffroyi* (Wagl.) ; Sharpe, *Cat. B. Brit. Mus.* xxiv. p. 217 (1896).

a—b. ♀ ad. Aden Harbour. September 21st.

135. *Ægialitis dubia*.

*Ægialitis dubia* (Scop.) ; Sharpe, *Cat. B. Brit. Mus.* xxiv. p. 263 (1896).

a. Ad. sk. Aden Harbour. September 21st.

136. *Ægialitis alexandrina*.

*Ægialitis cantiana* ; Yerbury, *Ibis* 1896, p. 34.

*Ægialitis alexandrina* (Linn.) ; Sharpe, *Cat. B. Brit. Mus.* xxiv. p. 275 (1896).

137. *Recurvirostra avocetta*.

*Recurvirostra avocetta* Linn. ; Sharpe, *Cat. B. Brit. Mus.* xxiv. p. 326 (1896).

a. Ad. Labej. September 9th.

138. *Himantopus himantopus*.

*Himantopus candidus* Bonnat. ; Yerbury, *Ibis* 1896, p. 35.

*Himantopus himantopus* ; Sharpe, *Cat. B. Brit. Mus.* xxiv. p. 310 (1896).

139. *Numenius arquata*.

*Numenius arquata* (Linn.) ; Yerbury, *Ibis* 1896, p. 35.

140. *Numenius phaeopus*.

*Numenius phaeopus* (Linn.) ; Yerbury, *Ibis* 1896, p. 35.

141. *Glottis nebularius*.

*Totanus canescens* (Gmel.) ; Hawker, *Ibis* 1898, p. 376.

142. *Totanus calidris*.

*Totanus calidris* (Linn.) ; Yerbury, *Ibis* 1896, p. 35.

a—b. ♀ ad. Aden Harbour. September 21st.

143. *Totanus stagnatilis*.

*Totanus stagnatilis*, Becht. ; Sharpe, *Cat. B. Brit. Mus.* xxiv. p. 422 (1896).

a. ♂ Al Khaur, Wadi Bani, Abian Country. October 6th.

144. *Totanus glareola*.

*Rhyacophilus glareola* (Gm.) ; Sharpe, *Cat. B. Brit. Mus.* xxiv. p. 491 (1896).

a. ♀ ad. Labej. August 22nd.

b. ♂ ad. Al Khaur, Wadi Hassan, Abian Country. October 6th.

145. **Helodromas ochropus.**

*Helodromas ochropus* (Linn.) ; Yerbury, *Ibis* 1896, p. 35

146. **Tringoides hypoleucus.**

*Tringoides hypoleucus* (Linn.) ; Yerbury, *Ibis* 1896, p. 35.

- a.* Ad. Shaka, N. of Lahej. August 30th.  
*b.* ♀ ad. Lahej. August 24th.  
*c—h.* ♂ ♀ ad. Sbaik Otbman. September 17th to 22nd.

147. **Terekia cinerea.**

*Terekia cinerea* (Güld.) ; Yerbury, *Ibis* 1896, p. 35.

- a—b.* Ad. Aden Harbour. September 21st.

148. **Machetes pugnax.**

*Machetes pugnax* (Linn.) ; Hawker, *Ibis* 1898, p. 376.

149. **Calidris arenaria.**

*Calidris arenaria* (Linn.) ; Yerbury, *Ibis* 1896, p. 35.

150. **Tringa alpina.**

*Tringa alpina* Linn. ; Yerbury, *Ibis* 1896, p. 35.

151. **Tringa minuta.**

*Tringa minuta* Leisl. ; Yerbury, *Ibis* 1896, p. 35

- a.* Ad. Aden Harbour. September 21st.

152. **Gallinago gallinago.**

*Gallinago celestis* ; Yerbury, *Ibis* 1896, p. 35.

153. **Dromas ardeola.**

*Dromas ardeola* Payk. ; Barnes, *Ibis* 1893, p. 170 ; Yerbury, *Ibis* 1896, p. 34.

154. **Larus ridibundus.**

*Larus ridibundus* Linn. ; Barnes, *Ibis* 1893, p. 176 ; Yerbury, *Ibis* 1896, p. 36.

155. **Larus brunneicephalus.**

*Larus brunneicephalus* Jerdon ; Barnes, *Ibis* 1893, p. 175 ; Yerbury, *Ibis* 1896, p. 36.

156. **Larus ichthyaëtus.**

*Larus ichthyaëtus*, Pall. ; Barnes, *Ibis* 1893, p. 175 ; Yerbury, *Ibis* 1896, p. 36.

157. **Larus leucophthalmus.**

*Larus leucophthalmus* Temm. ; Hartl. *P. Z. S.* 1881, p. 959.

Two specimens are recorded from Hami, South Arabia.

158. **Larus hemprichi.**

*Larus hemprichi*, Bonap. ; Barnes, *Ibis* 1893, p. 176 ; Yerbury, *Ibis* 1896, p. 36.

159. *Larus affinis*.

*Larus* sp. inc. ; Barnes, *Ibis* 1893, p. 175.

*Larus affinis* (Reinh.) ; Yerbury, *Ibis* 1896, p. 36.

Dr. H. O. Forbes and I found the species common at Aden in November, and procured several specimens.

160. *Sterna minuta*.

*Sterna minuta*, Linn. ; Barnes, *Ibis* 1893, p. 177 ; Yerbury, *Ibis* 1896, p. 36.

161. *Sterna albigena*.

*Sterna albigena* Reichenb. ; Barnes, *Ibis* 1893, p. 176 ; Yerbury, *Ibis* 1896, p. 36.

162. *Sterna bergii*.

*Sterna bergii* (Licht.) ; Barnes, *Ibis* 1893, p. 177 ; Yerbury, *Ibis* 1896, p. 36.

163. *Sterna media*.

*Sterna media* (Horsf.) ; Barnes, *Ibis* 1893, p. 178 ; Yerbury, *Ibis* 1896, p. 36.

164. *Sterna anæstheta*.

*Sterna anæstheta* Scop. ; Barnes, *Ibis* 1893, p. 178 ; Yerbury, *Ibis* 1896, p. 36.

165. *Sterna fuliginosa*.

*Sterna fuliginosa* Gmel. ; Barnes, *Ibis* 1893, p. 178 ; Yerbury, *Ibis* 1896, p. 36.

166. *Gelochelidon anglica*.

*Sterna anglica* Mont. ; Yerbury, *Ibis* 1896, p. 37.

167. *Puffinus persicus*.

*Puffinus persicus* Hume ; Barnes, *Ibis* 1893, p. 175 ; Salvin, *Cat. B. Brit. Mus.* xxv. p. 381, pl. iv. (1896).

168. *Podiceps capensis*.

*Podiceps capensis* Licht. ; Grant, *Cat. B. Brit. Mus.* xxvi. p. 513, pls. vii. and viii. (1898).

a. ♂ ad. Al Khaur, Wadi Hassan, Abian Country. October 6th.

The South African Dabchick is a new addition to the fauna of South Arabia.

[Only one seen.—A. B. P.]

169. *Podiceps nigricollis*.

*Podiceps nigricollis* Brehm. ; Barnes, *Ibis* 1893, p. 174 ; Grant, *Cat. B. Brit. Mus.* xxvi. p. 534, specimen "q" (1898).

170. *Turnix lepurana*.

*Turnix lepurana* (Smith) ; Barnes, *Ibis* 1893, p. 168 ; Yerbury, *Ibis* 1896, p. 32.

171. *Rallus aquaticus*.

*Rallus aquaticus* Linn. ; Yerbury, *Ibis* 1896, p. 33.

172. *Zapornia parva*.

*Zapornia parva* (Scop.) ; Sharpe, *Cat. B. Brit. Mus.* xxiii. p. 89 (1894).

a—c. ♂ ad. et ♂ ♀ imm. Al Khanr, Wadi Hassan, Abian Country. October 4th to 6th.

This is the first time the Little Crake has been recorded from Southern Arabia.

173. *Crex crex*.

*Crex pratensis* Bechst. ; Barnes, *Ibis* 1893, p. 172.

a. ♂ ad. Shaik Othman. September 17th.

b. ♂ ad. Al Khanr, Wadi Hassan, Abian Country, September 5th.

[Several Landrails were seen in the gardens at Shaik Othman ; those obtained were in very poor condition. Two or three were seen in the Abian Country near water.—A. B. P.]

174. *Gallinula chloropus*.

*Gallinula* sp. inc. ; Yerbury, *Ibis* 1896, p. 33.

a—b. ♂ ♀ ad. Al Khanr, Wadi Hassan, Abian Country. October 9th.

Colonel Yerbury observed this species at Haithalhim to the north of Lahej, but did not procure a specimen.

[Several seen near Al Khanr.—A. B. P.]

175. *Vinago waalia*.

*Vinago waalia* (Gmel.) ; Yerbury, *Ibis* 1896, p. 29.

a—b. ♂ ad. Haithalhim, N. of Lahej. September 6th.

Iris orange ; bill grey ; legs pale orange. (A. B. P.)

176. *Columba intermedia*.

*Columba livia* Yerbury (nec Bonnat.), *Ibis* 1896, p. 29.

a—c. ♂ ♀ ad. Lahej. September 1st to 6th.

[Iris brown ; bill black ; legs bright pink.

The Eastern Rock-Dove is to be seen in large numbers in most of the wadis which have high banks, in the wells, and on the minarets of the mosques. They are usually very tame, and sit about the mouths of the water-worn caves in the clay banks of the wadis. They are most common in the neighborhood of towns, where they seem to be semi-domesticated.—A. B. P.]

177. *Turtur turtur*.

*Turtur turtur* (Linn.) ; Salvad. *Cat. B. Brit. Mus.* xxi. p. 396 (1893).

a. Juv. Lahej. August 20th.

This is the first record of this species from Southern Arabia. The skin is that of a very young bird, only just able to fly, and the species must consequently breed in the neighbourhood of Lahej.

178. *Turtur senegalensis*.

*Turtur senegalensis* (Linn.) ; Yerbury, *Ibis* 1896, p. 30.

a. ♂ ad. Shaka, N. of Lahej. August 30th.

b. ♀ ad. Wadi Bana, Abian Country. September 29th.

179. *Turtur semitorquatus*.*Turtur risorius*; Yerbury, *Ibis* 1896, p. 30.

a. ♂ ad. Al Khaur, Wadi Hassan, Abian Country. October 2nd.

[Common at Al Khaur, feeding on the same fruits as the Hornbills. Not seen anywhere else.—A. B. P.]

180. *Turtur roseogriseus*.*Turtur roseogriseus* Sundev.; Salvad. *Cat. B. Brit. Mus.* xxi. p. 430 (1893).

a. ♂ ad. Shaka, N. of Lahej. August 30th.

Iris orange; bill black; legs mauve. (A. B. P.)

This is the first time this somewhat rare species has been recorded from Southern Arabia. A fine specimen was obtained by Dr. H. O. Forbes and myself during our trip to Lahej in November 1898.

181. *Ena capensis*.*Ena capensis* (Linn.); Yerbury, *Ibis* 1896, p. 30; Hawker, *Ibis* 1898, p. 375.

a—b. ♀ ad. et ♂ juv. Al Milah, N. of Lahej. August 16th.

c. ♂ ad. Shaka, N. of Lahej. August 30th.

d—h. ♂ ♀ ad et ♂ imm. Huswa, Bay of Aden. September 19th.

[♀ ad. Iris brown; bill black; legs bluish pink.

We found the Cape Dove extremely common in some places, particularly at Huswa, which is a shallow well near the coast of the Bay of Aden. There they were seen in hundreds passing to and from the well in a steady stream. They are easily caught in snares, and many are brought into Aden for sale in the Bazaar. They are also very common in the belt of Mimosa trees near Lahej, where they breed in colonies.—A. B. P.]

182. *Pteroclorus exustus*.*Pterocles exustus* Temm.; Yerbury, *Ibis* 1896, p. 30.

Living examples of this species obtained in Southern Arabia were safely transmitted by Mr. A. B. Percival to the Zoological Gardens, London. It is common in the neighbourhood of Lahej, and fair bags may be made in the early morning and in the evening by waiting near the water-holes. Considerable numbers are brought alive into Aden and sold as food.

183. *Pterocles lichtensteini*.*Pterocles lichtensteini* (Temm.); Yerbury, *Ibis* 1896, p. 31.

a. ♂ ad. Habil, Wadi Abrain, N.W. of Lahej. September 12th.

184. *Caccabis melanocephala*.*Caccabis melanocephala* (Rüpp.); Yerbury, *Ibis* 1896, p. 31.

a. ♀ ad. Al Milah, N. of Lahej. August 14th.

b. ♂ ad. Shaka, N. of Lahej. August 30th.

c. ♂ ad. Al Khaur, Wadi Hassan, Abian Country. October 8th.

[♂ Iris brown; bill and legs vermilion; naked skin round the eye pink; below white.



♀ Iris brown ; bill and legs pink.

This fine Partridge is usually met with among the foothills or in the rough wadis. It seems to prefer the open hillsides, and in the evening the *male* may constantly be seen perched on a projecting rock, where he remains calling for a long time. It is a very difficult bird to flush, but, once on the wing, will fly for a long distance before it again alights. The birds obtained in the wadis seem to be smaller than those from the Abian hills—one bird measuring 19 in. from bill to tail. The species was not seen at any great elevation.—A. B. P.]

#### 185. *Caccabis chukar*.

*Caccabis chukar* (G. R. Gray) ; Barnes, *Ibis* 1893, p. 166 ; Yerbury, *Ibis* 1896, p. 31.

If this species really occurs at Aden it is curious that it was not obtained during the present expedition.

#### 186. *Ammoperdix heyi*.

*Ammoperdix heyi* (Temm.) ; Grant, *Cat. B. Brit. Mus.* xxii. p. 93 (1893).

*Ammoperdix bonhami* ; Barnes (nec Fraser), *Ibis* 1893, p. 167 ; Yerbury, *Ibis* 1896, p. 32.

a. ♀ ad. Jebel Manif, N. of Lahej. August 14th.

It is unfortunate that only a *female* was procured. The *females* of the species of *Ammoperdix* so closely resemble one another that it is impossible to identify them with any certainty, and it must still remain somewhat doubtful which species occurs in Southern Arabia. The bird from Aden, sent home by the late Mr. Barnes to the Zoological Gardens on January 14th, 1892, was identified as *A. bonhami*. I never examined this specimen, and there is now no record as to whether it was *male* or *female*. I agree with Colonel Yerbury (cf. *Ibis* 1896, p. 32) in thinking that this bird must have been wrongly identified as *A. bonhami*. The species found at Muscat is certainly *A. heyi*, for there are an adult pair in the British Museum Collection.

[At the foot of Jebel Manif, near the only water in the district, I put up a covey of eight of these birds, but only obtained one specimen. The bird is well known to the native shikaris, who informed me that it is not common, but is occasionally seen in the hills. At Ma'ir I saw two pairs, but was unable to get a shot at them. One of my shikaris told me he saw this bird at Jimil. They are said to haunt the camping grounds at the foot of the hills.—A. B. P.]

#### 187. *Coturnix coturnix*.

*Coturnix communis* Bonnat. ; Yerbury, *Ibis* 1896, p. 32.

a. ♀ ad. Habil, Wadi Abraïn, N.W. of Lahej. September 14th.

b. ♀ ad. Shaik Othman. September 21st.

#### 188. *Coturnix delegorguei*.

*Coturnix delegorguei* Deleg. ; Yerbury, *Ibis* 1896, p. 32.

SOME NEW OR RECENTLY DESCRIBED *LEPIDOPTERA*.

BY THE HON. WALTER ROTHSCHILD, PH.D.

(Plate V.)

## LYCAENIDAE.

1. *Ogyris meeki* sp. nov. (fig. 1.)

THIS is the largest and most aberrant species of the genus, though distantly allied to *O. genoveva* Hew.

*Upperside*: Fore- and hindwings dark brown with a purple sheen, so that in a bright light they appear plum-coloured. Hindwing with dentated margin and two tails; the one situated at the upper median vein is much longer and broader, being also widened at the end.

*Underside*: Vinaceous fawn-colour. Internal area of forewing blackish; both fore- and hindwing with a number of brown spots encircled by fuscous bars, the shape and position of which can be best understood from the figure.

Length of forewing: 31 mm.

*Hab.* Milne Bay, British New Guinea (A. S. Meek), February 1899, 1 ♂; a second ♂ in the collection of Standinger from the same place.

## SPHINGIDAE.

2. *Chaerocampa kühni* sp. nov. (Pl. V. fig. 2).

♂ ♀. Similar to *Ch. insignis* Butl. from the Andamans, but smaller, forewings less pointed, and the pale band much more angulated.

*Hab.* Dammer Island, Banda Sea (H. Kühn), December 1898, a series of both sexes.

3. *Chaerocampa lunata* sp. nov.

This fine new species is closely allied to *Ch. castor* from Java, but is distinguishable by its more variegated forewing, especially the sharply defined white submarginal line.

The forewing has a submarginal series of sharply defined silvery lunules which form a chain with the points directed inwards. Base of inner margin with a snow-white streak.

*Underside* of a deeper red than in *Ch. castor*, basal half of forewings red and not smoky brown; both wings crossed by three parallel, blackish, transverse lines, of which the outer is broken up.

Body below much redder than in *Ch. castor*.

*Hab.* Khasia Hills, India, 4 ♂♂.

4. *Chaerocampa brunnea* (Pl. V. f. 3).

*Ch. brunnea* Semper, *Schmett. Philipp.* II. p. 400. n. 40. t. 52. f. 1 (1896) (Mindanao).

*Pamaca buruensis* Rothschild, *Nov. Zool.* VI. p. 69. n. 7 (1899) (Buru).

The insect I described from Buru seems to be the same species as *Chaerocampa brunnea*.

5. *Phalaenoides basiplaga* sp. nov. (Pl. V. f. 5. ♀).

♂ ♀. Differs from *Ph. megisto* Boisd. in the hindwing being marked with a large white basi-discal patch both above and below.

*Hab.* Milne Bay, British New Guinea, February 1899 (A. S. Meek), 1 ♂, 1 ♀.

6. *Phalaenoides kuhni* sp. nov. (Pl. V. f. 4. ♀).

♀. Palpi black, first segment, and end of second laterally and ventrally, white. Head dark fawn-colour, a ring round the frontal cone (not quite closed above), three spots on occiput, front of basal segment of antennae, and a stripe behind the eye, white. Thorax above fawn-colour, collar edged with white, a spot on patagia white, metanotum also marked white. Sterna white. Abdomen yellow, first segment white above, edged with black, the black edges of the other tergites less obvious; sternites edged with white, basal one all white. Legs: femora white, with a yellow spot above, tibiae black, with three white rings, yellowish in front, third apical, foretibia, besides, with a yellow patch; tarsi black, tip of segment 1 to 3 and base of segment 1 narrowly white.

*Wings, upperside.*—Forewing: dark fawn-colour, a trapeziform patch at internal margin in basal half, an irregular, oblique band from costa to internal angle, interrupted behind M<sup>2</sup>, a number of small dots in basal half, and two rows of dots upon the nervules outside the band, two submarginal spots at apex, and a series of dots at the end of the veins white.—Hindwing brownish black, a large basal patch, rounded externally, dots at end of veins, and a small submarginal spot at anal angle white.

*Underside* brownish black.—Forewing: a broad streak along internal margin from base to beyond middle, a short basal streak behind costal margin, two spots in cell, an oblique band as above, but more widely interrupted, a rather large apical spot, and a series of dots at margin, white.—Hindwing as above.

Length of forewing: 19 mm.

*Hab.* Dammer Island, Banda Sea, 11.12.98 (H. Kühn), 1 ♀.

## CHALCOSIIDAE.

7. *Canerkes gloriosus* sp. nov. (Pl. V. f. 6, ♀).

♀. Head and antennae above blue; face, a line on occiput and cheeks dirty white; palpi bluish black, dirty white ventrally. Thorax above blackish blue, collar edged white, patagiae with a white dot at end, mesonotum with another white dot at each side farther back, sterna blue; abdomen yellowish buff colour, ringed with blue above; more white beneath, without blue rings. Legs greenish-blue above, buff beneath.

*Wings, upperside.*—Forewing: black, with a greenish tint, without distinct gloss, with the following white spots; one at extreme base, followed by two others, an oblique series of four across middle of cell, a larger one upon cross-veins, an irregular series of five between cell and apex, and two near internal angle.—Hindwing: ultramarine blue, shot with purple outwardly, basal area and three streaks in abdominal area white, marginal area bluish black in front, yellow behind; three white spots in blue area.

*Underside:* both wings blue.—Forewing black at apex, markings essentially

as above.—Hindwing: the white spots somewhat larger, with two more discal spots, one before  $R^3$ , the other behind  $M^2$ , and two small submarginal spots between  $R^2$  and  $M^3$ .

Length of forewing: 31 mm.

*Hab.* Sumatra: Padang Sidempoean (Ericsson), 1 ♀.

#### 8. *Canerkes albivitta* sp. nov.

♀. Upperside of antennae and head, and part of sides of sterna and upperside of legs greenish blue; face part of sterna, legs and abdomen buff. Thorax above dark olive green, patagia tipped with white, metanotum white behind, first segment and underside of abdomen also white, tergites blue at bases.

*Wings above.*—Forewing: very dark olive green, not glossy; an oblique band in middle, crossing cell before end, stopping at  $SM^2$ , not interrupted, about 3 mm. broad, white; a subapical series of 5 small, rounded, spots, shaded with blackish scaling.—Hindwing: white, a marginal band, inwardly ultramarine blue, externally dark olive green, almost black, sinuate between  $R^3$  and  $M^1$ , almost reaching end of cell, very narrow between  $SM^1$  and anal angle,  $4\frac{1}{2}$  mm. broad before  $M^2$ .

*Underside.*—Forewing: white markings as above, but wider, base with dirty buff streaks; basal area glossy blue, disc outside band purplish blue, except black internervular patches, area outside subapical series of white spots black, a small white dot behind  $M^2$ .—Hindwing as above, but marginal band rather narrower in middle, a little wider behind, including the vestiges of white submarginal dots between  $R^2$  and  $M^1$ .

Length of forewing: 25 mm., width  $11\frac{1}{2}$  mm.

### GEOMETRIDAE.

#### 9. *Presos angelus* (Pl. V. f. 7 ♀).

*Presos angelus* Rothschild, Nov. Zool. V. p. 102, n. 12 (1898).

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## ON A NEW RACE OF IBEX.

*Capra sibirica lydekkeri* subsp. nov.

By HON. WALTER ROTHSCILD, Ph.D.

(Plate II.)

SOME time ago I received through Mr. Hagenbeck, of Hamburg, a very fine pair of an Ibex, which Mr. Hagenbeck thought was remarkable for the size of its horns. On showing it to Mr. Lydekker, he at once perceived that it differed somewhat both from the Tian-Shan form, the typical *Capra sibirica*, and the Himalayan *C. s. sakeen*. Since then another male specimen came to London from Mr. Hagenbeck, and was exhibited by Mr. Lydekker at a meeting of the Zoological Society. We had previously supposed that this Ibex was nearest to *C. s. dauvergnei*, under which name it was exhibited. While, however, making a description of this interesting new subspecies, I have come to the conclusion that it cannot be *C. s. dauvergnei*, both from its different locality and from the strongly pronounced knobs on the horns, and I have much pleasure in naming it after Mr. Lydekker.

Very old male: Centre of back creamy white, with a deep brown dorsal line running from behind the shoulders to the root of the tail. Head, neck, shoulders and flanks pale brown. Nape of neck and hind-quarters creamy white. Tail from the base for half its length of the same brown colour as the shoulders, rest very deep brown, white on the whole underside.

Forelegs from the hoof to the knee, hindlegs from the hoof to the hock brown. Forelegs from the knee to the shoulder of the same brown colour as the lower part of the leg in front, much paler behind. Hindlegs from the back to the stifle-joint of a very deep brown in front, much darker than the lower part of the leg, but behind from the hock upwards pale brownish white, gradually passing into the creamy white colour of the hindquarters.

Horns very massive and strongly curved. The circumference at the base in proportion to the length much greater than in the three other known subspecies of *C. sibirica*. The knobs in front of the horns are wider apart, narrower, and not so prominent as in *C. s. sakeen*, with which I have compared it. From the description in Mr. Lydekker's book this would always seem to be the case in comparison with typical *C. sibirica*.

A younger male appears to have the white saddle less extended, the general colour of the head and body darker brown and the hair of the legs longer with a more reddish tinge, while the white patch on the nape is very large and of a purer white than in the older male. The female is paler brown all over, with less distinct markings.

The principal differences between this and the other three races of *C. sibirica* appear to be the much larger size and bulk of the animal, the heavy beam of the horns, the large white nape-patch and coloration of the legs, which seems to be intermediate between that of *C. s. sibirica* and that of *C. s. sakeen*. In the former the legs are brown in front and white behind for their whole length, while in the



latter they are entirely brown. In this new form, however, the legs of the oldest *male* are quite brown on the lower half, as in *C. s. sakeen*, while on their upper half they are white behind as in *C. s. sibirica*.

The three specimens from which this description is made were collected by one of Mr. Carl Hagenbeck's travellers in the Katntay Range of the Altai Mountains, in the winter of 1898—1899.

Length of horns over curve in the oldest *male* 1180 mm. ( $=46\frac{1}{4}$  in.), in the younger *male* 960 mm. ( $=38\frac{2}{3}$  in.), circumference of horns at base in the oldest *male* 320 mm. ( $=12\frac{3}{8}$  in.)

## ON *TURACUS CHALCOLOPHUS* NEUMANN.

By ERNST HARTERT.

(Plate I.)

*Corythaix livingstoni* (non Gray!), Reichenow, *Journ. f. Orn.* 1887, p. 57.

*Turacus schalowi* (non Reichenow *Journ. f. Orn.* 1891, pp. 148, 210); Reichenow, *Vög. Deutsch-Ost-Afr.* p. 104 (1894) (Mori river, east of Nyanza).

*Turacus chalcolophus*, Neumann, *Orn. Monatsber.* 1895, p. 87; Shelley, *B. Afr. I.* (List) p. 119; Neumann, *Journ. f. Orn.* 1899, pp. 65, 73.

THIS interesting form of *Turacus* resembles very closely the Benguela Plantain-eater known as *Turacus schalowi* (Reichw.) (*Journ. f. Orn.* 1891, p. 5; *Cat. B. Brit. Mus.* XIX. p. 439), but differs from the latter in the length and colour of the crest-feathers. These are longer, reaching 112 mm. in the most adult *male* in the Berlin Museum; they are slightly widened towards the tip, and are distinctly metallic greenish-blue before the white tip.

The late Dr. Fischer shot *Turacus chalcolophus* on the Mori river on the east side of Victoria Nyanza, but his specimens were not separated from *T. schalowi*. Colonel von Trotha obtained it in the Loita Hills in German East Africa, and Oscar Neumann in the forests of Gurni, about 2000 to 2600 mm. above the sea, in the Loita Hills and on the Ngare Dobasch; so that it appears to inhabit the forest-clad mountains between the great Masai-ravine and the Victoria Nyanza, to about 1° southern latitude, while farther north, at Sotik and Man, only *Turacus hartlaubi* has been found so far (cf. *Journ. f. Orn.* 1899, p. 74).

According to Reichenow and Neumann typical *T. livingstoni* would only occur in the Zambesi region, while birds from German East Africa have been separated by Fischer and Reichenow, who described two new forms, which they named *T. reichenowi* and *T. hybridus*. These latter birds are evidently different from the more southern *T. livingstoni*, but possibly *T. reichenowi* and *hybridus* cannot be separated (cf. Neumann, l.c.).

The Tring Museum has received a skin of *T. chalcolophus* from Mr. Oscar Neumann, and I am at present not aware of any other examples in British collections.

The plate shows the characteristic points of Neumann's Plantain-eater very well.

## ON A REMARKABLE NEW SPECIES OF MANGABEY-LIKE MONKEY (*CERCOCEBUS CHRYSOGASTER*).

By R. LYDEKKER.

(Plate III.)

THIS monkey was sent from the Upper Congo to Mr. Carl Hagenbeck, of Hamburg, who forwarded it to London.

From the impossibility of examining the skull and dentition, the generic position of this interesting species cannot be accurately determined, but it appears to agree so closely in general characters with the "Mangabeys" that it may safely be placed for the present in the genus *Cercocebus*. It agrees with the other members of this genus in the bare upper eyelids (these both in this species and in the remaining ones of the genus should be described as flesh-coloured rather than white). It also agrees with the Mangabeys approximately in general form, relative length of tail, in the manner of carrying the latter over the back, and in its screaming cry when disturbed. It differs, however, from the ordinarily accepted definition of the genus *Cercocebus* in that the hairs of the crown of the head are distinctly annulated with yellow, as are to a lesser degree those of the back. But as a similar feature occurs in an undoubted *Cercocebus* now in the Zoological Society's Gardens (referred tentatively to *C. fuliginosus*\*), it is evident that the absence of annulation can no longer be regarded as characteristic of the genus. The specimen is not fully adult, so that the proper size of the form to which it belongs cannot be determined; but it evidently indicates a small monkey of the approximate dimensions of an ordinary *Cercocebus*.

Having the bare upper eyelids and general form of *Cercocebus*, this specimen may be described as follows:—

Hair of crown of head light olive-coloured, with a speckled appearance, due to the presence of dark and yellow rings on the individual hairs. Fur of back of the same general tint, but the speckling becoming less defined on the lateral and hinder portions of the back, and finally disappearing on the flanks and outer sides of limbs and tail, which tend to slate-grey in colour. Paws darker. Face brownish, whiskers somewhat lighter coloured than crown of head. Under-parts from chin to root of tail bright orange. Inner surface of limbs rather paler than outer surface.

The bright orange under-surface of this monkey distinguishes it from all other species of *Cercocebus*, as well as all species of *Cercopithecus*, and suggested at once the name of "*chrysogaster*."

No other Mangabey has any approach to the same ventral coloration. In young specimens of the "Drill" and "Mandrill" the chin-tuft is of the same orange

\* Having examined this specimen, I am of opinion that it is rather a very young female of the new species *Cercocebus chrysogaster* than of *C. fuliginosus*.—WALTER ROTHSCHILD.

hne, but the rest of the under-parts are quite different. It has been suggested that this monkey is a hybrid between a baboon (such as Mandrill or Drill) and a species of *Cercocbus* or *Cercopithecus*. If this were the case the nose would probably be longer, the tail much shorter, and the cheek-pouches (which are large) of small dimensions. Moreover the orange under-surface could not be accounted for in this way; so that this theory may be rejected and the specimen regarded as a distinct species, which may **provisionally** be assigned to the genus *Cercocbus*.

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# NOVITATES ZOOLOGICAE.

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## A MONOGRAPH OF *CHARAXES* AND THE ALLIED PRIONOPTEROUS GENERA.

By THE HON. WALTER ROTHSCILD, Ph.D., AND KARL JORDAN, Ph.D.

(Continued from Vol. VI. p. 286.)

(Plates VI., VII., VIII., XI., XII.)

### GENUS *CHARAXES*.

- Papilio Eques Achirus* Linné, *Syst. Nat.* ed. XII. p. 748 (1767) (partim; typus: *P. E. A. helena*); Drury, *Illustr. Exot. Ins.* I. index (1770); Cramer, *Pap. Exot.* I. p. 5 (1775); Fabr., *Syst. Ent.* p. 449 (1775); Goeze, *Ent. Beytr.* III. I. p. 50 (1779); Fabr., *Mant. Ins.* II. p. 6 (1788); Gmel., *Syst. Nat.* I. 5. p. 2234 (1790).
- Papilio Nymphalis Gemmatus*, Goeze (non Linné, 1758), *l.c.* p. 288 (1779).
- Papilio Nymphalis Phaleratus*, Gmelin, *l.c.* p. 2312 (1790).
- Papilio Nymphalis*, Fabricius, *Ent. Syst.* III. 1. p. 61 (1793).
- Papilio*, Donovan (non Linné, 1758), *Ins. of China* t. 35 (1798).
- Nymphalis*, Latreille (non Linné, 1758), *Hist. Nat. Crust. Ins.* XIV. p. 82 (1805) (typus: *P. E. A. jason* L.); Godart, *Enc. Méth.* IX. p. 350 (1823) (partim); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 306 (1850); Kirby, *Cat. Diurn. Lep.* p. 267 (1871).
- Paphia* Fabricius (non Bolt., 1798), in Illig., *Mogaz. Ins.* VI. p. 282 (1807) (partim; typus: *P. E. A. jason* L.).
- Charaxes* Ochsenheimer, *Schmett. Eur.* IV. p. 18 (1816) (typus: *P. E. A. jason* L.); Thon, *Naturgesch. Schm.* p. 72 (1837); Feld., *Nova Act. Ac. Car. Nat. Cur.* XXVIII. 3. p. 39 (1861); Butl., *Proc. Zool. Soc. Lond.* p. 622 (1865) (Monograph); Schatz, *Fam. & Gatt. Tagf.* p. 175 (1888); Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 173 (1893) (*Palla* = *Charaxes* ex err.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 348 (1896) (partim, Revision); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 221 (1899) (partim; Afric. spec.).
- Tigridia* Hübner, *Verz. Schmett.* p. 40 (1816-27) (partim; typus: *P. N. Ph. acesta* L.).
- Eriboea* id., *l.c.* p. 47 (1816-27) (partim; typus: *P. E. A. brutus* Cram.).
- Coea* id., *l.c.* p. 48 (1816-27) (partim; typus: *P. E. A. varanex* Cram.).
- Dococapa* id., *l.c.* p. 49 (1816-27) (partim; typus: *P. N. Ph. erminea* Cram.).
- Polyura* Billberg, *Enum. Ins.* p. 79 (1820) (partim; typus: *P. E. A. jason* L.).
- Satyrus*, Godart (non Latreille, 1810), *l.c.* p. 477 (1823) (partim).
- Apatura*, Boisduval (non Fabricius, 1807), *Ind. Méth.* p. 14 (1829) (partim).
- Jasia* Swainson, *Zool. Illustr.* II. 2. p. 90 (1831-32) (partim; typus: *P. E. A. jason* L.).
- Phyllophasia* Blanchard, *Hist. Nat. Ins.* III. p. 447 (1840) (partim; typus: *P. D. F. galanthis* Cram.).
- Philognoma* Doubleday, Westw. & Hew., *l.c.* p. 310 (1850) (partim; typus: *P. E. A. decius* Cram.).
- Palla*, Kirby (non Hübner, 1816-27), *Cat. Diurn. Lep.* p. 273 (1871) (partim).
- Monura* Mabille, *Bull. Soc. Zool. Fr.* I. p. 280 (1876) (typus: *P. N. Ph. zingha* Cram.).
- Haridra* Moore, *Lep. of Ceylon* I. p. 30 (1880) (typus; *Ch. psaphon* Westw.); id., *Lep. Ind.* II. p. 229 (1895).
- Charaxes* (*Haridra*), Wood-Mason & Nicév., *Journ. As. Soc. Beng.* LV. 2. p. 363 (1886).
- Palla* (*Charaxes*), Schaas & Clements, *Sierra Leone Lepid.* p. 9 (1893).

Differs from *Eulepis* in both sexes in the cell of the hindwing being open.

The egg of *Ch. jason* became known and was described and figured at the end of the eighteenth century. No other *Charaxes* eggs were compared till Doherty

took up the study of the butterfly eggs, and published some short but highly important notes on them in 1886. Doherty says of the egg of the "*Charaxinae*" (*Journ. As. Soc. Beng.* LV. 2. p. 109): "Eggs large, few, globular, hard, not so high as broad, with obscure ribs and cross-lines at the base only, forming (usually) tetragons, with minute projecting points at their intersection." For "base" should be read "apex." We have examined the eggs of a number of species, taken from the bodies of dry specimens. Apart from size, there is no apparent difference in the eggs of the various species. The micropyle end is flattened, slightly concave, with the centre raised; from the centre radiate slight ribs, which gradually disappear at the sides and do not reach the base or underside; the longitudinal ribs are connected by extremely feeble transverse ridges, and bear, as Doherty correctly points out, small projecting points, which are easily visible under a good lens.

The slug-shaped **caterpillar** is widest in or before the middle, narrowed behind, and has a finely granulated skin. The head is flat, prognathous, and bears four processes which point backwards and are rough with tubercles, as is the hinder edge of the head between the processes; cheeks also tuberculated; the anal segment bears dorsally two more or less prominent processes, which are longer in the young larva than in the full-grown one. The colour of the larvae is generally green, often yellowish, the head bears, on each side, a light line which runs along the outer horn, and there is a spot on one or more abdominal segments, the colour of these latter markings, which are mostly more or less halfmoon-shaped, is as a rule buffish, the spots having often a darker (reddish or bluish) border. The caterpillar is a very slow creature, which does not voluntarily leave the twig on a leaf of which the egg was deposited. Of *Ch. jason* it is known that the larva makes on the surface of the leaf on which it feeds a kind of web which serves for a foot-hold. The larva is known of *Ch. polyxena*, *psaphon*, *fabi*, *etheocles*, *brutus*, *varanes*, *cithaeron jason*. The thick **chrysalis** is bright green as a rule, very smooth and shining, dorsally very convex; head bluntly bipartite; end of abdomen with two rounded tubercles ventrally.

The **imago** of most species is robust, and has a powerful flight. The antenna is gradually thickened to a club; the last four segments are much shorter dorsally than ventrally, the tip of the club appears, therefore, when looked at from the side, rounded ventrally. The number of segments varies in the different species from 44 to 56, and is also individually not quite constant. The last 15 to 18 segments are broader than long, the preceding ones longer than broad, and the proximal segments again broader than long. The three ventral carinae are prominent; the deep grooves between them extend from the base to the apex of each segment, the proximal ones excepted. The sensory hairs are dispersed over the groove, but are more dense in the middle of each groove, forming here a rounded or oblong patch. The basal pair of setae, characteristic of the *Nymphalidae* (see Nov. Zool. V. p. 390), is well developed, as is also the lateral pair, which stands in the middle of the segment dorsally of the lateral carinae. The scaling is not dense, but reaches to the last but fourth segment; the scales are small and elongate, mostly black, those of the internal (or anterior) side rarely white (*varanes*).

The palpi reach well above the head and protrude forward, being somewhat S-shaped; they are longest in *eandiope*. The scaling is smooth ventro-laterally and does not show any interspersed long hairs, while the scales of the ventral edge and of the free part of the dorsal side are long, forming a kind of crest, the dorsal crest produced into a tuft which is contiguous to the eye; second segment two



or three times as long as the first; third generally pointed, seldom (*neanthes*) compressed and subtruncate.

Genital armature of ♂ with penis-funnel, the opening of which extends at least to the middle. The differences between the species in the various parts of the armature is generally very slight, but occasionally considerable. There is a great variety in the denticulations of the penis-sheath; if there is a series of teeth the most distal one is dorsal or nearly dorsal, while the series turns proximally towards the left side in most cases, the most proximal teeth being often ventro-lateral.

Legs: see Nov. Zool. V. p. 558.

There is a great diversity in the shape of the outline of the wings of *Charaxes*. The outer margin of the forewing varies from being nearly straight to being deeply concave, the most prominent point lying either between SC<sup>4</sup> and SC<sup>5</sup>, or at SC<sup>5</sup>, and is sometimes produced into a more or less acute angle at SC<sup>5</sup>. The hindwing is abdominally always somewhat, often considerably, longer than costally, and has in most species a triangular form. The strength of the dentition of the distal (or outer) margin of both wings varies much according to species and groups of species, and is also not quite constant within the species. The teeth at veins R<sup>3</sup> and M<sup>2</sup> of the hindwing are mostly produced into tails of various length, which may be pointed, rounded, or dilated at the tips. The upper tail, or, in other forms, the lower one, is not seldom wanting, either in one or both sexes, and there are also species without tails, while in others tooth M<sup>1</sup> is prolonged to a third tail. The anal angle is in many species more produced than the outer margin between the tails, which character is exaggerated in *Ch. zingha*.

There is nothing in the scaling—apart from the basal patch on the underside of the forewing—of the wings by which *Charaxes* is distinguished from the allied genera. As in other Butterflies (and Moths) the anterior half of the upperside of the hindwing and the basal and posterior half (or more) of the underside of the forewing are covered with scales of which those of the upper layer have the distal edge entire, not dentate. These parts of the wings are practically those that are covered when the Butterfly is at rest with the wings closed above the back. The extent of the areas with non-dentate upper scales is variable. As a rule, the upperside of the forewing has dentate scaling only, but there are species (*etheocles* ♂, *ameliae* ♂, etc.) in which the scales, at least of the upper layer, are more or less non-dentate on the forewing; and occasionally nearly the whole upperside of the hindwing, not only the anterior half, is covered with non-dentate scaling (*etheocles* ♂). Metallic scales are in Butterflies as a rule non-dentate. This does not hold good among *Charaxes*. While in a few species (*mycerina*, etc.) the light blue spots of the forewing above are composed of non-dentate scales, they consist of dentate ones in many other species (*tiridates*, etc.). The metallic basal area of the forewing found in many *Charaxes* (*tiridates*, *etesipe*, etc.) consists of sharply toothed scales. A rather great variety in size and outline of the scales is observed in the cell on the upperside of the forewing. Here we meet in one species with very long and very narrow scales (*eupale*); in others with sharply dentate scales and many hairs (*varanes*, etc.); in others again with long-toothed scales which are larger than the scales on the disc (*castor*, etc.); while in some species the scales in the cell and on the disc are not essentially different (*neanthes*).

The wing membrane is in many species, especially the tawny African ones, more or less green, as are here also the veins. The latter are accompanied, especially on the underside, by dispersed, long hairs.

The neururation exhibits some variation in several points. The length of cell of the forewing is not constant in the genus, three being species in which the distance from the lower angle of the cell to the base is greater than that to the end of  $R^3$  (*castor*, etc.); while in other *Charaxes* the reverse is the case (*Ch. polyxena*, for instance). Vein  $R^3$  of the forewing varies in position specifically and individually, joining  $R^3$  sometimes near the point of origin of  $M^1$ , sometimes 5 or more mm. distally of it.  $M^2$  of the forewing stands generally about midway between  $M^1$  and the base of  $M$ , but in many species it is considerably nearer  $M^1$ . The praecostal veinlet of the hindwing is often two-branched (*varanes*, *candiope*, etc.), sending a more or less long spur basad, whereas in most species it is simply curved distad, being, however, thickened at the bent as a rule. The distance between  $SC^2$ ,  $R^1$  and  $D^3$  of the hindwing is also not constant in the genus, and varies even individually; on the whole,  $R^1$  is midway between  $SC^2$  and  $D^3$ . As explained in vol. V., p. 557.  $D^3$  of the hindwing reaches  $M$  either at the point of origin of  $M^1$  (or near it), or is more proximal; there is some individual variability in this respect, but the more obvious differences are found in the sexes or in different species.

While in *Eulepis* the sexes do not differ very greatly, except in *epigenes* from the Solomon Islands, sexual dimorphism is among *Charaxes* a much commoner phenomenon than similarity of the sexes in colour and shape. The wings of the ♀ are always broader than those of the ♂, and the hindwing is, as a rule, less triangular; the tails are broader, often widened at the end; in some species the ♂ has one, the ♀ two tails, in other the tails of the ♂ are obliterated, while the ♀ possesses such an appendage.

The pattern of the upperside is often very different in the sexes and in the various species. The ♀♀ can be arranged according to the pattern of the upperside of the forewing into four groups:

(1) The discal and postdiscal interstices form a forked band, which is generally more or less interrupted at the veins into spots or patches. This is the normal type of ♀. There are many species in which the ♂ has a similar band, but in this sex the patches composing the band are smaller than in the ♀.

(2) The upper discal interstitial patches become small or obsolete, while the postdiscal ones form together with the posterior discal ones an oblique band which extends from the costal to the internal margins. This type is found in both sexes of a number of species, and in the ♂♂ only of some others.

(3) The upper postdiscal interstitial spots are reduced in size or absent, while the discal interspaces and the posterior postdiscal ones form a broad curved band. This type does not occur in the ♂-sex.

(4) The band is similar in appearance to that of type (3), but it is composed of the posterior postdiscal and discal interstices and the upper median ones, the band often entering the cell. This type is also confined to the ♀-sex, and is met with only in one polychromatic species 1, *ethocles*, of which other specimens belong to type (1).

It is worthy of note that though types (2) to (4) are doubtless derivations from type (1), the middle and upper discal interstitial patches are enlarged in type (3) and reduced in type (2), while the reverse is the case in regard to the upper and middle postdiscal spots. The same elements in the pattern of the wing follow here, in the same genus, opposite directions of development, a phenomenon which we meet with commonly among Lepidoptera. It is obvious that the divergency of the lines of development of such closely allied species is not explained by assuming that

the elements in the pattern develop phylogenetically according to a fixed "law." The phenomenon shows, on the contrary, that some agency foreign to the allied insects decides which of the many possible lines of development an element (dot, line, spot, patch, band, streak) of the pattern must follow.

The variability in the pattern—apart from "sports"—is in some species rather slight, relating only to minute differences in the size of the spots, the relative positions of the bars and general tint of the wings, while in others the individual differences are so great that some authors have considered them specific. In *Ch. polyxena*, for instance, both sexes are so extremely variable that ten odd specific names have been bestowed upon individuals from North India and Burma alone. The occurrence of very different individuals in the same locality may sometimes be due to meteorological factors acting upon the individual chrysalis. But we have no evidence of that in regard to *Charaxes*. Nor is there any evidence that the cases of variability put down by Butler as seasonal variation, and those queried as such by Moore and Aurivillius, are really seasonal. In many instances we have found that individuals belonging to two supposed seasonal forms occur together at the same time of the year, the one form not being apparently more plentiful than the other. Only such varieties should be called seasonal of which it is shown that they are seasonal. Considering differences of undated specimens as seasonal is unjustifiable—because arbitrary—as is treating those of not-localised individuals as geographical. The only suggestion we can here make as to seasonal variation among *Charaxes* is based on dated specimens of *Ch. polyxena* from North India; these specimens show that the individuals emerging from hibernated pupae are rather smaller than the average summer specimens.

We recognise 103 distinct species, of which 30 are divided into 90 subspecies (=geographical forms). To classify such a great number of species of a genus satisfactorily is not an easy matter. Though the relationship of any two species may be recognised with certainty, it remains often a purely arbitrary matter in which order the groups of species have to follow one another in the linear arrangement of a list. We have as guides in the classification of *Charaxes* some structural characters, such as the dentition of the costal margin and the length of the cell of the forewing, the sexual armature of the ♂, and the pattern. Of these characters, those of the sexual organs can be employed only with great caution.

These organs exhibit often but very slight differences in closely related species, and hence sometimes give important hints as to the relationship of species, if there are any special structures observed; but we must keep in mind that similarity in the penis or clasper does not necessarily indicate relationship, as the similarity may be the outcome of the obliteration of the different special structures. In this category of unreliable characters belongs, for instance, the occasional absence of denticulation from the penis. On the whole, there are few structural characters available in the classification of *Charaxes*, for the simple reason that the constant structural differences of groups of species, relating to both sexes, are employed to characterise genera. The species dealt with in this monograph being divided up into genera according to the structure of the body and wings, it is not possible to further divide these genera on purely structural characters. The colouration of the wings must, therefore, remain one of the chief guides in the arrangement of the species. But here again one must take care not to be misled by analogies, which are not rare among *Charaxes* as regards the phyletically younger pattern of the upperside of the wing. There is a whole series of species which bear on the upperside a remarkable



resemblance to other species of *Charaxes* with which they are not nearly related (*hildebrandti* and *brutus*, *anticlea* and *protoclea*, *guderiana* ♀ and *pelias*, various forms of *etheocles* ♀ and *bohemani*, *numenes* ♀, *cithaeron* ♀, etc.), and it is of great significance] that all these "mimetic" species can be grouped together on account of the agreement in the number of denticulations of the costal margin of the forewing with the number of scale-rows (see vol. V. p. 551). It is no less interesting that into this same group come also the peculiar acraeoid *zingha*, the *Argynnis*-like *jahlusa*, the green *eupale*, and *paphianus*, *mycerina* and allies with the leaf-like underside. Many of these species show, moreover, striking affinities in the pattern of the underside.

Another group is formed by the allies of *Ch. polyxena*, *varanes*, *candiope*, which have preserved, on the upperside, a more ancestral pattern than the other *Charaxes*, and may, for this reason, be put at the beginning of the series. Into a third natural group come the allies of *Ch. tiridates* in which the median bars  $SC^3$ — $R^2$  of the forewing below have left their normal place at one-third or one-fourth the way from the cell to the apex of the wing, having wandered proximad to near the cell; a transition to this group is found in *Ch. imperialis* and *ameliae* which have retained the normal position of those bars. A fourth group unites all the "typical" *Charaxes*, allied to *jason*, with heavy bars on the underside and black and white, or brown, lines upon the abdominal fold.

The greater proportion of the species is African (80), one occurs in the Mediterranean countries and 22 in the Indo-Australian region. The Mediterranean species (*jason*), as well as one of the Indo-Malayan *Charaxes* (*fabi*us) are of an African type, while the other eastern species have a near relative in the African *Ch. varanes*. Australia is not known to be inhabited by a species of this genus, while there occurs a form of *Eulepis*, a genus confined to the Indo-Australian region. New Guinea and the Bismarck Archipelago have one species, the Solomon Islands are without *Charaxes*, but the New Guinea species may be expected to be discovered there some day. On each of the Moluccan Islands one species only is found, with the exception of Burn, where two species have been obtained. Celebes has four, Sumatra five, Burma seven, Sikkim five, South India two, Java three, and the lesser Sunda Islands one each; from Borneo four species are known; Palawan has five species, while each of the Philippine Islands seems to be inhabited by three only; in China there is one species, which goes as far north as Shanghai.

The most striking features in the **habits** of *Charaxes* are the rapid flight, the partiality to putrid matter, and the constancy with which a specimen returns to the same spot. Few species are found in the open country (*Ch. pelias pelias*, *jason*, *fabi*us), where there are only bushes and rarely trees; most species inhabit the more wooded country, and some are found only in and near larger forests. The *males* come often in some numbers to water pools on roads; both sexes are fond of the juice of trees, of decaying fruits, dung of animals, putrid meat, and can successfully be entrapped by the use of such baits; one is known to come to flowers (*zoolina*).

1. *Underside*: discal bars of forewing and discal and postdiscal ones of hindwing arched; subbasal and submedian lines of bars of hindwing thin, reaching  $SM^3$  (or  $SM^1$ ); median bars  $SC^4$ — $R^2$  of forewing much more distal than  $R^2$ — $R^3$ ; or, if discal bars not clearly marked, median bar  $SC^4$ — $SC^5$  much more distal again than bars  $SC^5$ — $R^2$ .

A. Forewing below normally scaled between C and costal edge.

a. Discal line of bars of hindwing below moderately biconcave, no regular, sharply defined, pale buff, postdisco-submarginal ring between C and SC<sup>2</sup>.

a<sup>1</sup>. Median bars SC<sup>4</sup>—R<sup>2</sup> of forewing below more or less continuous.

a<sup>2</sup>. ♀, forewing above more or less mummy brown, basal area brighter, with creamy white halfmoons on disc; ♂ similar to ♀, or with basal half or two-thirds creamy olive buff.

a<sup>3</sup>. ♂ similar to ♀.

# 1. *Charaxes durnfordi* (Nov. Zool. VII. t. 6. f. 1 to 5).

*Charaxes durnfordi* Distant, Entom. XVII. p. 191 (1884) (Sunjei Ujong, Mal. Pen.).

♂ ♀. *Body above* varying in the different subspecies from tawny chestnut to cinnamon, paler in ♀ than in ♂, thorax somewhat greenish olive; *underside* whitish creamy buff, sides of sterna somewhat darker.

♂. *Wings above* of the colour of the body, forewing somewhat darker than the hindwing; this colour extends on forewing to near apex of cell and white discal spots, and shades into the blackish brown colour of the rest of the wing.—Forewing: black median bars very obscurely marked as black clouds or suffused patches, with white spots at their outer side, these more or less halfmoon- or angle-shaped, spot R<sup>2</sup>—R<sup>3</sup> mostly small, spots M<sup>2</sup>—SM<sup>2</sup> resembling together the letter M; a series of postdiscal spots white; these become gradually smaller costad, the posterior ones are also halfmoon- or angle-shaped, the submedian ones fused to a M, at internal margin there is mostly a white postdiscal and sometimes also a discal patch; admarginal interspaces occupied by white spots situated upon the internervular folds, the submedian ones sometimes fused to a rather large patch, the others always small, no dot between SC<sup>4</sup> and SC<sup>5</sup>, mostly also dots SC<sup>5</sup>—R<sup>2</sup> absent, seldom all obliterated.—Hindwing: discal bars more or less heavily marked, mostly halfmoon-shaped; they form the proximal border of a milky, or creamy, white band which consists of the postdiscal and admarginal interspaces and includes the ovate or circular black, postdisco-submarginal patches with white centres, in one form also the discal interspaces white, in which nearly half the wing is occupied by that colour, the white area narrowed at abdominal margin; median bars at least vestigial except last ones; admarginal line curved between veins, reaching extremities of veins, but separated between veins from edge of wing by white marginal spots.

*Underside* dirty creamy white; median interspaces of fore- and hindwing, except a small spot at outer side of dilated portion of bar D of forewing, more or less drab colour, paler on hindwing than on forewing; submedian interspace of cell of forewing and submedian interspaces of hindwing generally also somewhat drab; discal luniform bars of both wings very thin, not prominent.—Forewing: basal cell-spot heavy, the three cell-bars angled in middle; bar D heavy; submedian bar M<sup>1</sup>—M<sup>2</sup> more distal than usual, touching M<sup>2</sup> 6 to 8 mm. from point of origin of that vein, much more distal than submedian bar M<sup>2</sup>—SM<sup>2</sup>; submedian bar R<sup>3</sup>—M<sup>1</sup> present, short, oblique, almost longitudinal; median bars R<sup>3</sup>—SM<sup>2</sup> almost continuous, bar R<sup>3</sup>—M<sup>1</sup> generally a little more distal than the others, about 10 mm. from base of M<sup>1</sup>; median bar R<sup>2</sup>—R<sup>3</sup> more proximal than the other median bars, but at least 5 mm. from cell at R<sup>3</sup>, median bar R<sup>1</sup>—R<sup>2</sup> on a level with bar R<sup>3</sup>—M<sup>1</sup>, about 9 mm. from cell, forming an obtuse angle with bar SC<sup>5</sup>—R<sup>1</sup>; postdiscal bars represented



by ill-defined brown patches with a more distinct dot upon internervular fold, these dots somewhat closer to discal luniform bars than to outer margin of wing; discal interspaces often rather whitish at median bars.—Hindwing: bar D heavy and prominent; cell-bar 4 reaching M beyond origin of  $M^2$ ; subbasal and submedian series of bars continued to  $SM^3$ ; median bar  $R^3-M^1$  more distal than the two bars near it, 3 to 4 mm. from base of  $M^1$ ; postdiscal bars thin, more or less regularly arched; white submarginal dots vestigial or absent, black dots not very prominent, upper two mostly absent, admarginal brown line faint; upper tail short, triangular, 2 to 4 mm. long, second a very short tooth.

♀. Similar to ♂, but larger, paler, the white markings of the forewing mostly more extended; tail 6 to 8 mm. long, less pointed than in ♂, very faintly spatulate.

Length of forewing: ♂, 44–52 mm.

” ” ” ♀, 50–57 mm.

Tenth tergite of abdomen deeply sinuate, the two processes long and slender; penis-funnel long; penis denticulate along the upper edge, the teeth prominent, standing in an irregular row which is sometimes double before end; extreme tip of penis without teeth, slightly curved towards the left.

*Hab.* From Burma to Java and Borneo; rare, a forest species. The geographical races of this species from Java, Borneo, Malacca, Sumatra, and from Tenasserim-Burma are so conspicuously different that in 1893 I thought myself justified in treating them as distinct species. But we find now, on examination of a larger material, that the distinguishing characters of these geographical representatives are not so constant as I at first considered them to be.

*a. Ch. durnfordi nicholi* (Nov. Zool. VII. t. 6. f. 1).

♂. *Nymphalis nicholi* Grose Smith, *Ann. Mag. N. H.* (5). XVIII. p. 150 (1886) (Burmah).

*Charaxes nicholi* id. & Kirby, *Rhop. Exot. I. Char. t. 2. f. 1. 2* (1887); Nicéev., *Journ. Bombay N. H. Soc.* XII. p. 330. n. 12 (1899) (Dawnat Range, March).

♂. *Charaxes durnfordi* Elwes, *Proc. Zool. Soc. Lond.* p. 284 (1891) (Karen Hills); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 389. n. 111 (1896) (*synon. p. parte*; E. Pegu).

♂. *Haridra nicholi*, Moore, *Lep. Ind.* II. p. 246. t. 182. f. 2. (1896) (E. Pegu).

♂. *Wings above.*—Forewing: chestnut-colour, reaching just to base of  $M^1$ ; no white dots near upper angle of cell; discal markings  $M^2-SM^2$  fused together forming a sharply pointed M, spots  $SC^1-M^2$  angle-shaped, rather thin, spot  $R^2-R^3$  sometimes absent; postdiscal markings  $R^3-SM^2$  very much heavier; discal and postdiscal patches at internal margin fused; admarginal spots between veins obvious, last two separate.—Hindwing: interspaces between median and discal luniform bars creamy white, the discal series of luniform bars marked, especially between C and  $R^3$ , or scarcely vestigial; area in front of cell from near base of  $R^1$  to median bars blackish brown; median bars C— $R^1$  deeply arched; postdisco-submarginal black patches small, the second the largest, diameter of patches  $R^2-M^2$  only 3 mm., patches  $R^1-R^2$  and  $M^2-SM^2$  somewhat smaller; white marginal lunules well marked.

*Underside* with a purplish brown tint all over in side light.—Forewing: median and discal bars very much closer together than median and submedian ones, *nicholi* agreeing in this respect best with the Java form; postdiscal interspaces  $R^2-SM^2$  very much wider than discal ones, much shaded with drab.—Hindwing: postdiscal interspace  $SC^2-R^1$  wider than the others, the discal bar  $SC^2-R^1$  much closer to median bar than this is to submedian one; bars on abdominal fold much more broken in our specimen than in the figure in *Rhop. Exot.*, tail also a little longer.

♀. Unknown.

Length of forewing : ♂, 45—48 mm.

*Hab.* Burma and Tenasserim ; 1 ♂ in Tring Museum from the Dawnat Range, March 1895 (Hauxwell).

*b. Ch. durnfordi durnfordi* (Nov. Zool. VII. t. 6. f. 2).

*Charaxes durnfordi* Distant, *Entom.* XVII. p. 191 (1884) (Sungei Ujong, Mal. Pen.) ; id., *Rhop.*

*Mal.* p. 432. n. 9. t. 40. f. 8, ♂ (1886) ; Nicév., *Bull. of Ind.* II. p. 278 note (1886).

*Haridra durnfordi*, Moore, *Lep. Ind.* II. p. 248 (1896) (Mal. Pen.).

♂. *Wings above.*—Forewing : chestnut area more extended than in *nicholi*, reaching to lower angle of cell, and at internal margin to near white postdiscal patch, there being no white discal patch at internal margin ; discal spots  $SC^5-R^2$  and  $R^3-SM^2$  heavy, spot  $R^2-R^2$  minute, last two separated by ( $SM^1$ ) ; postdiscal spots  $M^2-SM^2$  forming a large M which, at  $SM^2$ , nearly touches the large, admarginal, white patch, which is much larger than in any other race, the two spots  $M^2-SM^2$  being merged together ; discal spot  $SC^4-SC^5$  vestigial ; dots beyond upper angle of cell present ; admarginal dots larger than in *nicholi*.—Hindwing : discal interspaces much shaded with pinkish buff, so that the black discal, luniform bars are very prominent ; the upper four of these bars enlarged (basad) to triangular patches ; postdisco-submarginal black patches all separated from one another, the upper two nearly touching each other, patches  $SC^2-M^1$  about  $\frac{2}{3}$  mm. distant from one another, patches  $R^1-M^2$  about as wide as postdiscal white interspaces ; admarginal line interrupted between veins, heavier upon veins ; white marginal half-moons large.

*Underside.*—Forewing : median interspace  $M^1-M^2$  narrower than discal one ; discal interspaces  $M^1-SM^2$  wider than postdiscal ones.—Hindwing : median bar  $SC^2-R^1$  midway between submedian and discal ones.

Length of forewing : ♂, 48 mm.

*Hab.* Sungei Ujong, Malay Peninsula.

Up to 1900 only one specimen known to science, the *type*, which is now in the Tring Museum. *Female* unknown.

*c. Ch. durnfordi connectens* (Nov. Zool. VII. t. 6. f. 3, ♂).

*Charaxes (Haridra) durnfordi*, Nicéville & Martin (*non* Distant, 1884), *Journ. As. Soc. Beng.* LXIV.

2. p. 437. n. 262 (1895) (*pt.* ; N.E. Sumatra, ♂, ♀).

*Charaxes durnfordi*, Hagen, *Iris* IX. p. 187. n. 248 (1896) (N.E. Sumatra).

*Charaxes (Haridra) connectens* Nicéville, *Journ. As. Soc. Beng.* LXVI. 2. p. 554. n. 10. t. 3. f. 24, ♂ (1897) (N.E. Sumatra).

♂. *Wings, above.*—Forewing : discal and postdiscal spots  $R^3-SM^2$  somewhat shorter than in *durnfordi durnfordi*, the admarginal spots  $M^2-SM^2$  not fused together to a large patch, and in other admarginal dots slightly smaller than in *durnfordi*.—Hindwing : brown admarginal line a little heavier, and white submarginal spots (within black postdisco-submarginal patches) on the whole a little smaller than in *durnfordi*.

*Underside* as in *durnfordi*.

♀. Like ♂, paler, the white spots larger.

Length of forewing : ♂, 48—50 mm.

“ “ “ ♀, 57 mm.

*Hab.* N.E. Sumatra. In the Tring Musenm 2 ♂♂, 1 ♀ from Dr. Martin and 1 ♂ from Dr. Hagen, the latter caught in August 1891.

M. de Nicéville when describing (*l.c.*) the Sumatran specimens of *Ch. durnfordi* as a distinct species (!) avoided giving any differential characters between *connectens* and the Malaccan *durnfordi*; he compares it with the more deviating *nicholi* from Burma and *staudingeri* from Java. As the single specimen of *Ch. durnfordi durnfordi* which is known is in the Tring Museum, we are enabled to point out the above-mentioned differences. But these differences are so slight that they may turn out to be purely individual, considering that the Sumatran specimens are not at all constant in the size of the white markings. As M. de Nicéville has, however, given a name to the Sumatran examples, we must keep the insects in question subspecifically separate, until further material from the Malay Peninsula proves that *connectens* is a synonym of *durnfordi durnfordi*.

The insect is as rare in Sumatra as it is elsewhere. It "occurs in heavy forest on the lower ranges and outer spurs of the Battak Mountains," says Dr. Martin, who took his first specimen in 1888 at Roemeh Kenangkong.

Dr. Hagen received also two specimens from the Battak Mountains: his collector captured a ♂ at Bandar Kwala in Serdang, and Dr. Hagen himself found a ♂ in Serdang in the dense forest.

**d. *Ch. durnfordi staudingeri* (Nov. Zool. VII. t. 6. f. 4, ♂).**

♂. *Charaxes staudingeri* Rothschild, *Iris* VI. p. 349. n. 2 (1893) (Java); id., Nov. Zool. II. t. 8. f. 2, ♂ (1895); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 389. n. 113 (1896) (Java).

*Charaxes durnfordi-staudingeri* (!), Fruhstorfer, *Berl. Ent. Zeitschr.* XLI. p. 302 (1896) (Palabuan, ♂ ♀).

*Charaxes durnfordi staudingeri* (!), Fruhstorfer, *Ent. Nachr.* XXIII. p. 237 (1897) (♀, Palabuan).

*Haridra staudingeri*, Moore, *Lep. Ind.* II. p. 248 (1896) ("N. Borneo" *ex errore loco* "Java").

*Charaxes (Haridra) staudingeri*, Nicéville, *Journ. As. Soc. Beng.* LXVI. p. 535. n. 9 (1897) (Java).

♂ *Wings above* darker than in the preceding races, the basal area of both wings being mummy brown, not chestnut.—Forewing: discal spots  $M^1$ — $SM^2$  shaded with brown, much closer to postdiscal ones than in the other races, spot  $R^2$ — $R^3$  elongate, thin, more distal than in the other races, the series less irregular in position; spots beyond upper angle of cell obsolete; postdiscal spots  $R^3$ — $SM^2$  very wide, spots  $SC^5$ — $R^3$  small, the upper one often absent, postdiscal patch at internal margin present, the discal one vestigial; admarginal dots absent or faintly vestigial, submedian ones sometimes present, but very thin.—Hindwing: median bars very obscure, discal interspaces with little buffish scaling; discal bars much less arched than in the other races, especially bars  $R^2$ — $SM^2$ , hence proximal edge of white area much less convex between veins: postdisco-submarginal black patches, often with violet scaling at edges, pointed upon internervular folds, the middle ones often reaching the very heavy admarginal line, patches  $R^1$ — $M^2$  not broader than the interspaces between them; veins within white area generally a little heavier black in the other forms.

*Underside.*—Forewing: median bars  $R^3$ — $SM^2$  standing in a straight row, the bars themselves angled, bar  $R^2$ — $R^3$  about 1 mm. from bar  $R^1$ — $R^2$ ; median interspaces  $R^3$ — $SM^2$  much wider than discal ones, the latter narrower than postdiscal ones; outer margin much shaded with brown, especially below apex.—Hindwing: discal interspace  $SC^2$ — $R^1$  wider than median one.

♀. *Wings above*.—Forewing : both the discal and postdiscal spots very large, the two series close together, except in front ; discal spot  $R^2$ — $R^3$  placed as in ♂, but separated from the spots near it only by the lower veins ; postdiscal spot  $SC^5$ — $R^1$  elongate, thin, no spot before  $SC^5$  ; admarginal spots absent, except submedian ones which are vestigial ; no white spots beyond upper angle of cell.—Hindwing as in ♂, but postdisco-submarginal patches larger ; discal interspaces more buffish, hence discal bars more prominent ; admarginal line still heavier, the admarginal white interspaces very narrow, much shaded with violet.

*Underside* as in ♂, discal luniform bars very feeble, especially on forewing : the discal and postdiscal series of bars of hindwing rather wider apart than in the Sumatran form.

Length of forewing : ♂, 44—46 mm.

♀, 50 mm.

*Hab.* Java ; in the Tring Museum 4 ♂♂, 1 ♀ from Tjisolok (*type*, Grelak), Palabuan and Mount Gede (Prillwitz, received from Herr Fruhstorfer).

Dr. Standinger has with great kindness presented me with the type specimen of this form, which I described from his collection.

*e. Ch. durnfordi everetti* (Nov. Zool. VII. t. 6. f. 5, ♂).

♂. *Charaxes everetti* Rothschild, *Iris* VI. p. 348. n. 1 (1893) (Barram R., N. Borneo, July 1892) ; id., Nov. Zool. II. t. 8. f. 5 (1895) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 389. n. 112 (1896). *Nymphalis dunfordi* (!), Pagenstecher, *Abh. Senk. Gesellsch.* XXIII. p. 404. n. 190 (1897) (Sandakan).

*Haridra everetti*, Moore, *Lep. Ind.* II. p. 248 (1896) (N. Borneo).

♂ *Body above* and basal area of forewing cinnamon, much paler than in the other subspecies of *durnfordi*.—Forewing : the cinnamon colour extending along internal margin to angle of wing ; discal and postdiscal white markings rather thin, the posterior ones about 1 mm. thick in middle, but all much prolonged distad, forming deeply arched half-moons, except discal spots  $SC^5$ — $R^3$  which represent acute angles ; white spots beyond upper angle of cell prominent ; discal spots  $M^2$ — $SM^2$  separate ; admarginal spots present, spots  $M^2$ — $SM^2$  not fused ; these and the postdiscal spots somewhat violet.—Hindwing : median bars more obvious than in the other races, owing to the pale colour of the wing, discal interspaces pale wood-brown at median bars ; discal bars deeply arched, prominent ; postdisco-submarginal black patches much larger than in the other subspecies, the white postdiscal interspaces reduced to narrow half-moons ; the admarginal white interspaces shaded with violet ; admarginal line heavy ; dirty creamy white marginal lunules not very prominent.

*Underside* pale, but median interspaces deeper brown, at least on forewing, than in the Sumatran and Malaccan forms.—Forewing : postdiscal, angle-shaped, brown patches very prominent ; median interspace  $M^1$ — $M^2$  narrower than discal one, median bar  $R^2$ — $R^3$  nearly 4 mm. distant from bar  $R^1$ — $R^2$ .—Hindwing : bar D, very prominent, median bars  $R^3$ — $M^2$  closer to discal bars than in the other forms.

♀. Unknown.

Length of forewing : ♂, 52 mm.

*Hab.* Borneo. In the Tring Museum 1 ♂ (*type*) from Bukan, N. Borneo, July (A. Everett) ; single specimens also in other collections.



b<sup>2</sup>. ♂ different from ♀, basal half of wings being creamy olive buff above in ♂, olive tawny in ♀.

2. *Charaxes nitebis* (Nov. Zool. VII. t. 6. f. 6, ♀, Celebes).

♂. *Nymphalis nitebis* Hewitson, *Exot. Butt.* H. Nymph. t. 2. f. 7. 8 (1859) (Celebes); Kirby, *Cat. Diurn. Lep.* p. 272. n. 48 (1871) (Celebes).

♂ ♀. *Charaxes nitebis*, Staudinger, *Exot. Tagf.* p. 173 (1886) (Celebes, Minabassa).

♂. *Body above* raw umber colour, thorax somewhat olivaceous green; *underside* creamy buff, sides of sterna somewhat darker.

*Wings above* black, basal half of forewing and basal two-thirds of hindwing (abdominal fold excepted) covered with creamy scaling which appears creamy olive buff where both upper and under layer are pale, as is the case from base of M<sup>2</sup> of forewing to near outer edge of pale area, and anteriorly on disc of hindwing, while the remainder of the pale area is greenish olive buff owing to the under layer of scales being black.—Forewing: olive buff area reaching anteriorly just to upper angle of cell, but there is an olive creamy buff patch beyond apex of cell between R<sup>1</sup> and R<sup>2</sup>, generally divided by the black median bar R<sup>1</sup>—R<sup>2</sup> and separated from the area only by the black bar D, outer edge of area sinuate between veins R<sup>3</sup> and M<sup>2</sup>, less so between M<sup>2</sup> and SM<sup>2</sup>, oblique, crossing M<sup>2</sup> about 11 mm. from edge of wing and reaching internal margin 6 to 8 mm. from posterior angle; median bars R<sup>3</sup>—M<sup>1</sup> sometimes marked, separating from the area a rather thin lunule, bar M<sup>1</sup>—M<sup>2</sup> sometimes vestigial; two discal and a series of postdiscal spots creamy olive buff: discal spots between SC<sup>5</sup> and R<sup>2</sup> 2 to 4 mm. long, separated from each other, about 8 to 9 mm. from upper angle of cell; postdiscal spots smaller, the series concave from R<sup>2</sup>—M<sup>2</sup>, spot R<sup>1</sup>—R<sup>2</sup> a little more proximal than the next, spot SC<sup>5</sup>—R<sup>1</sup> sometimes vestigial, spots M<sup>2</sup>—SM<sup>2</sup> not seldom absent, spot R<sup>2</sup>—R<sup>3</sup> 7 mm. from outer margin.—Hindwing: olive buff area extending costad beyond SC<sup>2</sup>, here the median bar C—SC<sup>2</sup> generally marked and the cellule C—SC<sup>2</sup> from base to median bar black, but mostly an olive buff stripe along SC<sup>2</sup>, at outer side of the bar the pale colour forms generally a triangular patch that reaches C and is separated from the rest of the area only by the more or less obviously black vein SC<sup>2</sup>, bar SC<sup>2</sup>—R<sup>1</sup> seldom marked; abdominal region up to M and M<sup>2</sup> raw umber colour, middle and base of fold somewhat whitish; black outer marginal area widest in front, measuring at SC<sup>2</sup> about 12 to 15 mm., the olive buff scaling extends distad along veins R<sup>3</sup>—M<sup>2</sup> and reaches, at M<sup>1</sup> and M<sup>2</sup> often the admarginal spots; submarginal white dots minute, the second the largest; admarginal interspaces occupied by greenish olive buff spots, which are widely separated from one another, are externally straight or slightly convex, proximally triangularly dilated at ends, and are often divided at the internervular folds into triangular spots; last spots more or less shaded with yellow; between these spots and the white dots there are the submarginal black dots, which are generally deeper black than the remainder of the black outer area.

*Underside* buffish wood-brown, discal interspaces creamy white at median bars, outer marginal area down to discal, luniform, bars slightly washed with wax-yellow; bars in basal half somewhat olive, not deep black.—Forewing: median bars R<sup>3</sup>—SM<sup>2</sup> continuous or nearly so, bar R<sup>2</sup>—R<sup>3</sup> closer to cell, bars SC<sup>5</sup>—R<sup>2</sup> about midway between cell and discal series of bars; the latter concave from R<sup>1</sup>—M<sup>1</sup>, the upper two more proximal than bar R<sup>1</sup>—R<sup>2</sup>; discal interspaces R<sup>3</sup>—M<sup>2</sup> much wider than the median interspaces; postdiscal spots light chestnut with an olivaceous tint,



spots  $M^2$ — $SM^2$  well marked, the others gradually fading away as one approaches the costal margin, the spots separated from the discal bars by thin pale wood-brown interspaces; black submarginal dots more or less faintly vestigial, white scaling between the postdiscal and submarginal spots obvious at apical and posterior angles of wing.—Hindwing: costal subbasal bar (at outer side of PC) absent; median bars almost continuous, forming a slightly convex line from costal to abdominal margin, bars  $M^2$ — $SM^2$ , though broken twice, much more regular than in the tawny *Charaxes*; submedian series of bars stops generally at ( $SM^1$ ), but sometimes bar ( $SM^1$ )— $SM^2$  is marked, forming an acute angle with bar  $M$ —( $SM^1$ ); discal interspaces  $C$ — $R^3$  wider than median ones; postdiscal spots of the same colour as on forewing, more or less halfmoon-shaped, spot  $SC^2$ — $R^1$  more or less obsolete, spot  $R^1$ — $R^2$  the heaviest; the white and the black submarginal dots separated by blue or greyish blue scaling, black dot  $C$ — $SC^2$  absent or vestigial; admarginal interspaces pale buff-yellow, separated at veins, nearly straight outwardly; admarginal brown line thin; edge of wing washed with brown and ochraceous; upper tail 3 to 5 mm. long, second a very short tooth.

♀. Body above tawny olive, hairs on thorax somewhat olivaceous green; under-side cream colour.

*Wings above* olive tawny, sometimes rather darker brown, apical two-thirds of forewing brownish black.—Forewing: the black bars not defined owing to the outer two-thirds of the wing being suffused with black, but their position indicated by creamy white or somewhat buffish markings which occupy part of the discal and postdiscal interspaces; the series of discal markings consists of seven spots, of which spots  $R^3$ — $M^2$  are strongly arched, spot  $SC^5$ — $R^1$  generally preceded by a creamy white dash, occasionally there are some creamy scales near upper angle of cell between  $SC^{4.5}$  and  $R^2$ ; postdiscal spots  $SC^4$ — $SM^2$  placed like postdiscal interspaces of underside, spot  $SC^4$ — $SC^5$  often obsolete, the two submedian ones fused, occasionally rather obscurely marked, posterior spots larger than anterior ones; posterior admarginal interspaces sometimes marked as ill-defined buffish or russet spots.—Hindwing: median bars  $C$ — $R^1$  fused with the purplish black area that extends from these bars to base and gradually fades away into the olive-tawny colour of the disc; two creamy white patches at outer side of these bars, often washed over with brown, followed sometimes by some whitish scaling behind  $R^1$ ; postdisco-submarginal black patches  $C$ — $R^1$  extended basad to discal creamy patches, but patch  $SC^2$ — $R^1$  only so along  $SC^2$ , patches  $R^1$ — $M^2$  more or less incompletely isolated, longer than broad, their submarginal portions deep black, patches  $M^2$ — $SM^2$  isolated; white submarginal dots large; admarginal interspaces shaped as in ♂, of the colour of the disc or paler; admarginal line dark brown.

*Underside* as in ♂, somewhat paler, the white patches in discal interspaces larger; tail as in ♂, somewhat broader.

Length of forewing: ♂, 40—44 mm.

" " " ♀, 44—49 mm.

Tenth abdominal tergite deeply sinuate, the two processes not quite so slender as in *Ch. durnfordi*; dentition of penis less heavy, claspers narrower.

*Hab.* Celebes, and Sula Islands.

The male bears a superficial resemblance on the upperside to *Eulepis pyrrhus*.

We recognise two geographical races :

**a. *Ch. nitebis nitebis* (Nov. Zool. VII. t. 6. f. 6, ♀).**

*Nymphalis nitebis* Hewitson, l.c.

*Charaxes nitebis*, Butler, *Proc. Zool. Soc. Lond.* p. 635. n. 51 (1865) (Celebes); Staud., l.c.; Rothsch., *Iris* V. p. 437. t. 6. f. 3, ♀ (1892) (S. Celebes).

*Nymphalis nitebis*, Pagenstecher, *Abh. Senk. Gesellsch.* XXIII. p. 403. n. 188 (1897) (Minahassa; Dongala).

♂. Discal series of bars of underside not heavier than median one, the upper discal bars of forewing rather feeble; median interspace  $M^2-SM^2$  of forewing narrower than the median interspaces before it; black submarginal dots of hindwing smaller than the greyish blue ones.

♀. The pure creamy white portions of the discal patches  $C-R^1$  of the hindwing *above* wider than long; discal lunules  $R^3-M^2$  of forewing  $1-1\frac{1}{2}$  mm. thick at internervular folds; on *underside* the median interspaces of forewing and the black and blue dots of hindwing as in ♂.

*Hab.* Celebes. In the Tring Museum 22 ♂♂, 5 ♀♀: from Maros country, August and September 1891 (W. Doherty), Dongala and Tawaya, Palos Bay, August and September 1896 (W. Doherty), Toli Toli, November–December 1895 (H. Fruhstorfer).

We do not find any constant difference between the examples from North and South Celebes. The *males* from the South are on the whole somewhat paler beneath than those from the North, and our single *female* from the South has the postdiscal spots of the forewing above rather buffish.

**b. *Ch. nitebis sulaensis* Rothsch., subsp. nov.**

♂. The discal spots  $SC^5-R^2$  of the forewing *above* generally larger than in *nitebis*, the postdiscal spots  $M^2-SM^2$  less often absent; submarginal dots  $M^2-SM^2$  present. The *underside* is less pale than in *nitebis*, the discal bars are heavier black, the median interspace  $M^2-SM^2$  of the forewing is broader than the interspace  $M^1-M^2$ , the black submarginal dots of the hindwing are much larger than in *nitebis*, and the blue spots at their proximal side brighter blue.

♀. The discal spots of the forewing *above* are rather wider than in *nitebis* and purer cream-colour, lunule  $R^3-M^1$  nearly 2 mm. thick at internervular fold, small creamy dots beyond upper angle of cell more distinct, admarginal spots  $M^1-SM^2$  better marked, the others faintly vestigial; on hindwing the creamy white discal spots are larger, being longer than broad, the admarginal spots are obviously paler than the disc, and the black submarginal spots are larger than in *nitebis nitebis*.

The *underside* exhibits the same differences from *nitebis* as the ♂ does.

*Hab.* Sula Islands. In the Tring Museum from: Mangoli (*type*), W. Doherty, October and November 1897, 13 ♂♂, 1 ♀; Besi, W. Doherty, October 1897, 1 ♀; Mangoli (Dr. Platen), 1 ♂.

$b^2$ . Forewing above without a series of creamy white halfmoons on disc.

$e^3$ . Upperside of hindwing without a band of large postdiscal, pale blue, halfmoon-shaped patches.

$a^4$ . Forewing above without a creamy, postdiscal, narrow band.

$a^6$ . Bars of underside not pale chestnut, white band of forewing, if present, not considerably narrowed behind.

$a^6$ . Forewing above not blue in ♂, white band not widely interrupted at  $R^2$  in ♀.

The "tawny" *Charaxes* which follow here have so many characters in common that we give a general description of all the species in order to avoid repetition.

♂ ♀. *Wings, upperside*, varying according to species and sex from rich tawny orange to buff yellow, base generally deeper in tint than disc.—Forewing: cell-bars generally not marked, but in the paler forms mostly shining through from the underside; bar D more or less heavy, dilated costally, mostly divided by the tawny orange discocellular vein; submedian bars  $M^1$ — $SM^2$  often showing through from below, median bars  $R^2$ — $SM^2$  often all or partly well-marked, sometimes absent, median bar  $R^2$ — $R^2$  about 1 or 2 mm. from cell, median bars  $SC^3$ — $R^1$  not often absent, generally rather heavy, sometimes forming patches; discal bars uniform, black or brown, the series about parallel to margin, but costally somewhat curving basad, the upper bars often patch-like, closer to outer margin than to cell; discal interspace mostly paler than rest of wing, often white; postdisco-submarginal black or brown patches more or less rounded, if isolated, the postdiscal interspaces separating them from the discal lunules either tawny orange or more or less white; outer edge of wing black or brown, admarginal interspaces paler brown, or tawny orange; very often the discal, postdisco-submarginal and marginal black or brown markings all fused together to form a broad border to the wing, which border often includes a series of brown resp. tawny orange spots, in some cases the black border is costally dilated to apex of cell.—Hindwing: abdominal fold pale buff-yellow; median bars C— $R^1$  mostly marked, the other median bars as well as the submedian and discal ones either not visible, or showing through from below, discal interspace often pale, sometimes white, at least in front; a series of postdisco-submarginal patches, the anterior ones the largest, including a series of white submarginal dots, of which often only the last two are developed; an admarginal black or brown line mostly visible, sometimes complete, often interrupted at veins; the postdisco-marginal area often all black, with or without tawny admarginal interspaces; tails varying in length according to species, sex and individual, longer in ♀ than ♂ as a rule, the second generally short, with the exception of the ♀♀ of a few species, the tails seldom both reduced to mere teeth.

*Underside* in various tints of brown and yellow, according to species, sex, or individual, olivaceous brown, yellowish, ferruginous, buff-yellow, the darker parts more or less glossy; discal interspace at distal side of median bars often pale, sometimes white; median interspace generally (with some exceptions) darker in tint than the discal and submedian interspaces.—Forewing: cell with three arched or undulated bars, sometimes with a fourth bar at base indicated by a dot, cell-bar 3 often separated into dots; submedian and median bars generally well marked, mostly sharply defined; submedian bar  $R^3$ — $M^1$  often present, very short, close to base of  $M^1$ ; discal bars uniform, in most species more proximal than the black or brown discal lunules of the upperside; postdiscal and submarginal bars mostly indistinct, generally fused together to form ill-defined patches which often bear white scaling in centres representing the white submarginal dots, the submarginal spots are occasionally more bar-like, and the white (silvery) scaling is often much extended, in which case the postdiscal indistinct dark blotches are well separated from the submarginal black or brown spots or bars.—Hindwing: basal costal bar never absent, though sometimes rather faintly marked, curved distad; costal subbasal bar seldom present, then situated at the outside of the praecostal veinlet; subbasal, submedian and median bars more or less discontinuous, forming irregular series the bars on the abdominal fold absent or short, but sometimes scarcely interrupted



between M and SM<sup>3</sup>, and occasionally joined to each other by a longitudinal line; discal bars regularly arched, bar SC<sup>2</sup>—R<sup>1</sup> the most proximal of the series; post-discal lunules broader, ill-defined, often much less arched, sometimes nearly straight, especially the posterior ones, the discal and postdiscal series meeting at SM<sup>2</sup>, the series being farther apart in front; a row of black submarginal dots, about midway between edge of wing and postdiscal lunules, more or less shaded proximally with metallic blue scales; at their proximal side, often joined to them, stand white dots; postdiscal and admarginal interspaces not glossy.

*Body above* of the colour of the base of the wings; *underside* paler, middle of sterna buff or whitish; palpi above (free portions) black, underside buff or white.

In this group we find the commonest *Charaxes* of the Indo-Malayan fauna; the range of the group extends from Ceylon, N.W. India and China to the Bismarck Archipelago.

The Indian and Malayan species are, in the *male* sex, very fond of moisture; they assemble on wet places of roads, sometimes in great numbers.

*a*<sup>7</sup>. Discal bars of hindwing below all regularly arched, and the series of postdiscal bars convex in middle, nearly parallel to outer margin.

### 3. *Charaxes latona* (Nov. Zool. VII. t. 11. f. 5, ♀).

*Charaxes latona* Butler, *Proc. Zool. Soc. Lond.* p. 631. n. 37. t. 37. f. 1, ♀ (1865) ("Timor" loc. err.).

♂ ♀. *Body above* tawny orange, rather darker in front than behind; below more tawny at sides, but paler in middle; middle of sterna and tip of anterior tarsi pale buff; femora buffish white, speckled with black scales; underside of palpi whitish buff, paler than middle of prosternum.

♂. *Wings above* slightly paler than thorax, both with a broad black border, or the discal luniform markings of the forewing and the postdisco-submarginal patches of the hindwing isolated, with intergradations.

*Underside* deeper fulvous than the upperside, less orange, sometimes partly slate-colour, the bars well defined.—Forewing: row of median bars R<sup>2</sup>—SM<sup>2</sup> oblique, hence discal interspace R<sup>2</sup>—SM<sup>2</sup> narrower behind than at R<sup>2</sup>, bar R<sup>3</sup>—M<sup>1</sup> just behind bar R<sup>2</sup>—R<sup>3</sup>, or very little more proximal, bars M<sup>2</sup>—SM<sup>2</sup> resembling in shape the number 3, seldom less pointed at (SM<sup>1</sup>); median bars SC<sup>3</sup>—R<sup>2</sup> continuous, forming an angle upon R<sup>1</sup> and reaching R<sup>2</sup> midway between median and discal bars R<sup>2</sup>—R<sup>3</sup>; discal bars fulvous brown or black, well defined, deeply and regularly arched, continuous, prolonged distad upon the veins; the postdisco-submarginal patches seldom distinct, the paler scaling within them developed costally to some silvery white patches.—Hindwing: median bar R<sup>3</sup>—M<sup>1</sup>, 1 or 2 mm. beyond origin of M<sup>1</sup>, bar M<sup>1</sup>—M<sup>2</sup> exactly behind it or very little more proximal or distal, bar R<sup>2</sup>—R<sup>3</sup> just in front of it, seldom more proximal; discal bars strongly arched, conspicuous, the series curving distad in middle, hence more parallel to outer edge of wing than in the other fulvous *Charaxes*; black and blue submarginal dots convex outwardly, admarginal fulvous brown bars arched, hence the paler admarginal interspaces, at the outside of those dots, much narrowed midway between the veins, being here not wider than, scarcely as wide as, the black dots; upper tail variable in length, triangular, second a mere tooth.

♀. Larger than ♂; wings broader, paler, but basal region often darker; upper tail longer, but sometimes very short, triangular or of nearly even width, not spatulate, second tail always very much shorter than the first.—Wings, *upperside*:

forewing, median bars  $R^2-M^1$  always marked, bar  $M^1-M^2$  also often present, median bars  $SC^5-R^2$  generally developed to triangular patches; discal bar deeply incurved, more or less arrowhead-shaped, especially bar  $R^2-R^3$ , black or fulvous, prolonged distad at the veins, these luniform markings in nearly the same position as the discal lunules of the underside, the latter markings, therefore, not shining through above, or the discal lunules of the upperside are partly a little more proximal than those of the underside (in the allied species the reverse is the case); postdisco-submarginal patches more or less ovate, 2 to 7 mm. in diameter, patch  $SC^1-SC^5$  the largest, black or brownish black, separate from the black, or blackish brown, edge of the wing, but sometimes the admarginal interspace, except the last ones, so densely shaded with black that the rounded outer edge of the spots is scarcely traceable; discal and postdiscal interspaces paler than the basal area of the wing, sometimes white.—Hindwing: median bars  $C-R^1$  seldom absent, the following two or three seldom present; bar  $D$  present only in a few forms; discal luniform bars present in some subspecies, in the subspecies from New Hanover very heavy; postdisco-submarginal patches ovate, the second the largest, the white submarginal dots within them sometimes absent from the upper patches.

*Underside* paler than in ♂, the submedian, discal, postdiscal and admarginal interspaces of both wings especially pale, bars as in ♂, discal ones of forewing more arched, the discal interspaces of both wings with fulvous yellow or blackish scaling distally, this scaling forming triangular patches which are distally bordered by the discal lunules.

Length of forewing: ♂, 38–45½ mm.

“ “ “ ♀, 47–57 mm.

Penis with one prominent tooth before the tip (Pl. VIII. f. 1, *papuensis*), usually accompanied by one or two minute teeth, a few more small ones about 2 mm. from the tip; the dentition varies a little, but is essentially the same in all the subspecies of *latona*; no other *Charaxes* has the same armature.

*Hab.* Sula Islands, Northern Moluccas, Aru Islands, New Guinea and the islands near its coast, Bismarek Archipelago. Not recorded from the Southern Moluccas (Ceram, Amboina), the Key Islands, North Australia, and the Solomon Islands. The species is geographically very variable; the extreme subspecies (*diana* from New Hanover and *meridionalis* from British N. Guinea) are very different in appearance, but are connected by intermediate forms.

#### a. *Ch. latona artemis* Rothsch., subsp. nov.

♂. *Wings above*: black border of forewing extending at costal margin nearly to apex, its inner edge concave from  $SC$  to  $M^1$ , crossing  $R^3$  6 mm. from  $D^3$ , an indistinct fulvous (discal) spot in the border behind  $R^1$ , no median bars  $R^3-M^2$ ; discocellular bar obsolete behind, being black only in front; outer margin of forewing somewhat more concave than in *latona latona*.—Hindwing as in Batjan specimens, the black border rather narrower; the three last admarginal fulvous interspaces marked, of which the anal one is more yellow, edge of wing (not fringe) brown between  $R^3$  and  $SM^2$ , except at veins.

*Underside* on the whole somewhat paler than in Batjan and Halmahera examples, especially the forewing, the bars thinner and their whitish plumbeous edges much less distinct; on the hindwing the median bars  $R^1-M^1$  are not continuous, upper end of bar  $R^2-R^3$  more distal than lower end of bar  $R^1-R^2$ , and lower end of bar  $R^2-R^3$  more proximal than upper end of bar  $R^3-M^1$ .



♀. *Upperside* as in the paler tawny orange examples from Halmahera, the markings very variable individually in distinctness and size; bar D of forewing obsolete behind; the last five postdisco-submarginal patches of the hindwing mostly smaller than in *lat. latona*; the discal lunules of the forewing either tawny ochraceous or blackish; outer edge of forewing and admarginal line of hindwing in two specimens deep tawny ochraceous, in one more blackish.

*Underside* as in Halmahera examples, or the discal, postdiscal and admarginal interspaces more buff-colour; the bars thinner; median bars  $R^1-M^1$  situated as in ♂, not continuous.

Length of forewing: ♂, 40 mm.

" " " ♀, 50–55 mm.

*Hab.* Mangioli (= Mangoli = Mangola), Sulla Archipelago: *type* ♂ (Platen) in coll. Standinger, 1 ♀ (Platen) in coll. Stand.: 1 ♀ (Platen) and 1 ♀ (Doherty, October 1897) in Mns. Tring.

In the ♀ caught by W. Doherty the median and discal markings of the *upper*-side are mostly much darker, and hence more conspicuous, than in the other two ♀♀ examined by us.

*b. Ch. latona latona* (Nov. Zool. VII. t. 11. f. 5, ♀).

- Charaxes latona* Butler, *Proc. Zool. Soc. Lond.*, p. 631. n. 37. t. 37. p. 1. ♀ (1865) ("Timor" *loc. err.*); Stand., *Ecot. Tagf.* p. 172 (1886) (*latona* ♀, = *cimon* ♂, Batjan, Halmahera); Honr., *Berl. Ent. Zeitschr.* XXX. p. 131 (1886) (*latona* ♀, = *cimon* ♂, = *brennus* ♀); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 397. n. 136 (1896) (*syn. ex parte*: "Timor" *loc. err.*; "a. Macassar, b. Amboyna, d. Aru" = *affinis*, c is ♂, not ♀).
- Charaxes brennus* Felder, *Reise Novara, Lep.* p. 439. n. 715. t. 59. f. 1. 2, ♀ (1867) (Gilolo); Butl., *Trans. Ent. Soc. Lond.* p. 120. n. 6 (1870) (*brennus* ♀ of *affinis*?).
- Charaxes cimon* Felder, *l.c.* n. 716. t. 58. f. 6. 7, ♂ (1867) (Batjan); Butl., *l.c.* n. 7 (1870) (distinct; both sexes seen); id., *Journ. Linn. Soc. Lond.* XXV. p. 395. n. 130 (1896) (Batjan).
- Nymphalis latona*, Kirby, *Cat. Diurn. Lep.* p. 272. n. 49 (1871) ("Timor" *loc. err.*; Gilolo); Pagenst., *Abh. Senck. Gesellsch.* XXIII. p. 404. n. 189 (1897) (Batjan; not "Celebes").

♂. *Wings, upperside*.—Forewing: black outer area occupying anteriorly more than half the wing, extending often along SC to apex of cell, being here 20 mm. (or more) wide, the area gradually narrowing behind, measuring 8 or 9 mm. at  $SM^2$ , more or less obviously incised at  $R^3$  and  $M^1$ ; discal bars  $SC^5-R^2$  fused with the black area, but sometimes (in a Halmahera specimen) partly separated from it by two fulvous orange spots; (the same individual has a fulvous orange postdiscal spot before  $SM^2$ ); median bars  $R^2-M^1$  always (?) present in Batjan individuals, occasionally also bars  $M^1-(SM^1)$ , in most Halmahera examples only the median bar  $R^2-R^1$  is marked, and this is occasionally also wanting; bar D mostly feebler behind than in front, in some Halmahera specimens obsolescent behind.—Hindwing: median bars  $C-R^1$  present in all Batjan specimens, which, moreover, have also the disco-cellular bar feebly marked; in Halmahera individuals the bar  $SC^2-R^1$  is mostly absent; the black outer area is 12 to 15 mm. wide behind  $SC^2$ , its edge so irregular, the black scaling extending along the upper veins; the rounded postdisco-submarginal patches are traceable in the area, the posterior patches are partly, and more or less obviously, separated from one another and from the black marginal line; the three upper submarginal white dots are sometimes minute or obsolete.

*Underside* dark russet, distal portion of discal interspace of forewing and postdisco-submarginal interspaces of hindwing slaty grey and glossy, forewing at outside of median and discal bars and hindwing at outside of discal bars fulvous-ochraceous;

the bars heavy, their plumbeous edges also conspicuous ; admarginal interspaces of hindwing dirty gallstone-yellow. Upper tail 4—5 mm., second half the length or less.

♀. *Wings, upperside*, basal area up to median bars varies from brownish tawny orange to ochraceous tawny orange, being on the whole browner in the specimens from Batjan than in those from Halmahera; the discal, postdiscal and admarginal interspaces paler, being dark orange ochraceous, except the outer portion of the discal interspaces at the postdiscal bars, and the posterior portion of the disc of the hindwing, which are of nearly the same tint as the bases of the wings.—Forewing : median bars  $SC^5$ — $R^2$  forming triangular patches, bars  $R^2$ — $M^1$  generally also heavy, while median bar  $M^1$ — $M^2$  is mostly feebly marked ; of the discal, luniform, bars, the upper three are the heaviest, the others are often fulvous, not black.—Hindwing with two median bars, only in one specimen (type of *brennus*) with one bar.

*Underside* : submedian, proximal portion of discal, and admarginal interspaces, buff-colour, median interspace much more brown ; all the bars heavy, inclusive of those on the abdominal fold ; postdiscal luniform spots of the hindwing tawny russet ; the discal, black, lunules of the forewing a little more distal in the Batjan specimens than in most individuals from Halmahera. Upper tail 6—8 mm long, second  $2\frac{1}{2}$ — $3\frac{1}{2}$  mm.

Length of forewing : ♂, 39—45 mm.

“                    “                    “                    ♀, 48—55 mm.

*Hab.* Northern Moluccas. In the Tring Museum from Halmahera, 4 ♂♂, 5 ♀♀ ; Batjan, 5 ♂♂, 7 ♀♀ (W. Doherty, March 1892, 1 ♀).

The type of *latona* was said to be from “Timor,” but it does not differ from Halmahera individuals ; the figure in *P.Z.S.* 1865 is rather roughly executed. The specimen was bought, according to the “Register,” from Mr. Stevens, together with a number of other Lepidoptera, all said to be collected by Mr. Wallace on Timor. This collection contained several well-known North Moluccan forms which cannot be expected to occur as such on Timor (see Nov. Zool. VI. p. 442).

The specimens from Batjan are on the whole darker than those from Halmahera ; but the distinctions do not hold good according to the material from both islands submitted to us for examination and selection by Messrs. Standinger and Bang-Haas. In one of our Batjan ♂♂ the black scaling of the upperside is much more extended than in ordinary specimens, the costal margin of the forewing and anterior third of the cell are black, the tawny area of both wings is also less bright than in ordinary ♂♂.

### c. *Ch. latona ombiranus* Rothsch., subsp. nov.

♂. As large as the largest specimens of *latona latona*.

*Wings, upperside*.—Forewing : black area fully as wide as in the average example of *latona latona* ; bar D obsolete behind ; median bars  $R^2$ — $M^1$  developed ; edge of black area not obviously incised upon  $R^3$  and  $M^1$ .—Hindwing : black area wider behind than in *latona latona*, a slight indication of the tawny admarginal interspaces  $M^1$ — $SM^2$ .

*Underside* darker than in *latona latona*, the bars still heavier.—Forewing : the postdisco-submarginal patches very indistinctly marked, extending close to the discal lunules, admarginal interspaces less yellow than in *latona latona*, interrupted at the veins ; in one specimen the outer half of the wing minutely striolate transversely.—Hindwing : admarginal, gallstone-yellow, interspaces more deeply concave outwardly than in the allied form ; tails somewhat longer.

♀. Much more different from *latona latona* than ♂.

*Wings, upperside*, basal area darker than in subspecies *latona* (as is also the body).—Forewing: the median bars  $SC^1$ — $M^1$  very heavy, bar  $M^1$ — $M^2$  also heavy, all black; discal luniform bars brownish black, all sharply marked, but not heavy, the upper ones not heavier than the others; postdisco-submarginal patches sharply defined, well separated from the brownish black outer border of the wing, patches  $SC^3$ — $SC^5$  fused together, larger than in *latona*, vein  $SC^4$  not tawny within this patch; the discal postdiscal and admarginal interspaces buff or whitish buff, more yellow at the proximal side of the discal lunules.—Hindwing: median bars  $C$ — $R^1$  present, the upper three heavy, discal interspace between these bars and the black postdisco-submarginal patches buff; discal lunules of the underside faintly marked; postdisco-submarginal patch larger than in the other Moluccan subspecies; admarginal interspace buff, hence black marginal line very conspicuous.

*Underside*: bars very heavy; submedian (partly), discal, postdiscal and admarginal interspaces buff; basal, subbasal, and median interspaces much deeper brown than in *latona latona*; postdisco-submarginal spots of forewing indistinct and small; postdiscal lunules of hindwing dark chestnut, the contiguous patches outside them, which include the white submarginal dots and extend distally to the black submarginal dots, hair brown, darker than in *latona*.

Length of forewing: ♂,  $45\frac{1}{2}$  mm.

♀, 54—56 mm.

*Hab.* Laiwui, Obi, 2 ♂♂, 2 ♀♀ (W. Doherty, Sept. 1897).

The differences from the other forms of *latona* are very conspicuous in the ♀. The ♀ of *latona ombiranus* resembles more the ♀ of *latona diana* from New Hanover than the ♀♀ of those subspecies which are geographically nearer.

#### d. *Ch. latona papuensis*.

*Charaxes papuensis* Butler, *Lep. Erot.* p. 15. t. 6. f. 1, ♂ (1869) (Dory = Dorey, ♂, not ♀, from Arau); id., *Journ. Linn. Soc. Lond.* XXV. p. 395. n. 131 (1896) (N.W. Guin.; *cimonides* "Rothschild" *ex err.*).

*Nymphalis affinis* var. b. *C. papuensis*, Kirby, *Cat. Diurn. Lep.* p. 272. sub. n. 50 (1871) (Papua).

*Charaxes cimonides* Grose-Smith, *Nov. Zool.* II. p. 356. n. 124 (1896) (Humboldt Bay).

♂. *Wings, upperside*.—Forewing: the black outer border not so wide in front as in *latona latona*, hence less narrowing behind; black median bars  $SC^5$ — $R^2$  standing separate from the black border, often absent, the same in position as the respective bars of the underside; discocellular bar mostly obsolete behind, very seldom the posterior portion of the bar black; median bars  $R^2$ — $SM^2$  absent, or slightly showing through from below, only in one individual from Humboldt Bay are median bars  $R^2$ — $M^2$  marked.—Hindwing: no constant difference from the examples of *latona latona*, except that the tails are shorter; the white submarginal dots are minute, the upper ones mostly absent; of the admarginal tawny spots only the last one before  $SM^2$  is always indicated, the one in front of  $M^2$  is also often traceable, while the preceding ones are very seldom vestigial.

*Underside*: paler brown than in *latona latona*, not appearing so much variegated in colour; the bars much thinner, the bars on the abdominal fold thin or absent; postdiscal interspaces of hindwing much less bright in colour, the postdisco-submarginal grey interspaces less glossy, the admarginal line of the hindwing much paler brown, wider, less sharply defined, the yellow admarginal interspaces of the

same wing much less conspicuous, being less yellow and smaller; the brown marginal line broader, less well-defined than in the Moluccan race.

♀. *Wings*, fringe (as in ♂) less extended white than in *latona latona*.

*Upperside*.—Forewing: upper discal luniform bars not heavier than the others, except in a ♀ from Waigen and another from Salawatti, closer to the postdisco-submarginal black (or brownish black) patches than in *latona latona*, except in the Waigen specimen.—Hindwing: black, or blackish brown, marginal line broad, interrupted at the veins, much less curved between veins than in *latona latona*; tails shorter.

*Underside* differs from that of *latona latona* ♀ in the same way as in ♂; besides, the buff yellow colour at the distal side of the median bars of both wings is more restricted.

Length of forewing: ♂, 40—43 mm.

“ “ ♀, 47—53 mm.

*Hab.* Dutch New Guinea. In the Tring Museum from Dorey, 2 ♂♂, 3 ♀♀; Humboldt Bay, 3 ♂♂ (Doherty); Skroe, S.W. New Guinea, 2 ♀♀; Kapaur, S.W. New Guinea, 14 ♂♂, 2 ♀♀ (W. Doherty, December 1896 to February 1897); Waigen, 2 ♂♂, 1 ♀ (Dr. Platen, rec. from Messrs. Staudinger and Bang-Haas); Salawatti, 1 ♀ (H. Kühn).

*Type* of *papuensis* in coll. Grose-Smith from coll. Saunders.

The three Humboldt Bay examples (described by Mr. Grose-Smith as *cimonides*) approach the following subspecies in the median bars  $SC^5$ — $R^2$  of the upperside of the forewing standing closer to the black border of the wing than in the ordinary individuals of *papuensis*; in one of the three individuals the median bars  $R^2$ — $M^2$  are marked on the upperside of the forewing, and there are tawny, postdiscal, rather obscure, lunules in the black border of the forewing between  $R^2$  and  $SM^2$ : on the hindwing of this specimen, above, the tawny admarginal interspaces  $R^1$ — $SM^2$  are marked, the three last are especially clearly defined, and the black postdisco-submarginal patches  $R^1$ — $SM^2$  are partly well-defined.

*e. Ch. latona stephanus* Rothschild, subsp. nov.

*Charaxes latona* v. *cimonides*, Staudinger (non Grose-Smith, 1894), *Iris* VII. p. 120 (1894) (Konstantinshafen).

*Charaxes affinis* var. *papuensis*, Hagen, *Jahrb. Nass. Ver. Nat. L.* p. 94. n. 160 (1897) (Germ. N Guinea).

Though the country inhabited by the present subspecies is farther away from the Moluccas than the area occupied by the preceding subspecies (*papuensis*), *Ch. latona stephanus* is nevertheless intermediate in characters between *latona papuensis* from Dutch New Guinea and *latona latona* from the Northern Moluccas. This fact is so interesting and is of so high importance for the study of geographical variation, that we must fix the knowledge of it by giving a name to the race occupying the eastern part of northern New Guinea.

♂. *Forewing above* with the black border broader in front than in *latona papuensis*, its inner edge more irregular; median bars  $SC^5$ — $R^2$  entirely fused with black border, or with a small fulvous spot each at the distal side.—Hindwing as in *papuensis*, but the tails very short as a rule, and the black border on the whole a little narrower.

*Underside* as in *papuensis*.



♀. *Wings above* as in ♀ *papuensis*, but the discal luniform bars of the forewing blacker, deeper incurved, more angulated, especially bar  $R^2$ - $R^3$ .—Hindwing as in *papuensis*, tails shorter.

*Underside*: four upper discal bars of forewing more angle-shaped than in *papuensis*.

Length of forewing: ♂, 38—45 mm.

" " " ♀, 50 mm.

*Hab.* Northern parts of German New Guinea. In the Tring Museum: 12 ♂♂, 5 ♀♀ from Stephansort and Erima (Dr. Hagen, February, April, August, September, December).

Dr. Hagen found this form in February, April, July, August, October, December, and concludes that apparently a new brood appears regularly every two months.

### f. *Ch. latona layardi*.

*Charaxes latona*, Pagenstecher (non Butler, 1865), *Jahrb. Nass. Ver. Nat.* XLVII. p. 77. n. 32 (1894).

(Neu Lauenburg); Ribbe, *Iris* XI. p. 132 (1898) (Neu Pommern; Neu Lauenburg); Pagenst., *Lepidopt. Bismarck-Land*, in Chun, *Zoologica*, Heft 27. p. 91 (1899) (*p. parte*; Ralum).

*Charaxes layardi* Butler, *Journ. Linn. Soc. Lond.* XXV. p. 395. n. 132 (1896) (N. Britain; N. Ireland, ♂♂).

♂. Very close to *Ch. latona stephanus*, but the postdisco-submarginal patches of the upperside of the hindwing partly separated from each other, the admarginal tawny interspaces at least vestigial between all the veins.

♀. *Wings above*.—Forewing: discal luniform bars appearing farther away from the postdisco-submarginal patches, the latter being smaller, than in *papuensis* and *stephanus*, well separated from the marginal line.—Hindwing: discal bar C- $SC^2$  well marked, all the other discal (luniform) bars vestigial; the ground-colour between these discal lunules and the marginal line of (about) the same pale orange-yellow colour as the disc at the outside of the median bars C- $R^2$ ; postdisco-submarginal patches farther away from the marginal line than in the allied races from German and Dutch New Guinea, more triangular, and marginal line much thinner.

*Underside* more yellow than in the before-mentioned races, the discal (black) lunules of the forewing farther away from the rather well-defined postdisco-submarginal patches, the interspace between the lunules and the patches pale yellow; cell uniform in tint. On the hindwing the interspace between the discal lunules and the tawny chestnut, postdiscal, spots broader than in *papuensis* and *stephanus*, the pale yellow admarginal interspaces more than twice the width of those of the allied New Guinean subspecies; marginal line thin, well separated from fringe: median interspace of both wings rather dark brown.

Length of forewing: ♂, 45 mm.

" " " ♀, 54 mm.

*Hab.* Bismarck Archipelago: Neu Pommern (= N. Britain); Neu Lauenburg (= Duke of York Is.); Neu Mecklenburg (= N. Ireland). In the Tring Museum from: Kinigunang, Neu Pommern, 1 ♂, and Mioko, Neu Lauenburg, 1 ♀ (C. Ribbe).

Both Dr. Pagenstecher and Herr Ribbe say that the specimens they have examined are not distinguishable from the individuals from German N. Guinea (Konstantinshafen), while Dr. Butler considers them to be specifically distinct from *papuensis*, *layardi* being "a representative of *C. cimon*." *Ch. cimon* stands in Dr. Butler's Revision two pages separate from *Ch. latona*, of which it is a synonym.



*g. Ch. latona diana* (Nov. Zool. V. t. 7. f. 3, ♀).

*Charaxes latona diana* Rothschild, Nov. Zool. V. p. 96. n. 1 (1898) (N. Hannover); Pagenst., Lepidopt. Bismarck-Arch., in Chun, Zoologica, Heft 27. p. 91 (1899).

♂. *Wings, upperside*, more extended black than in any other form of *latona*, also darker orange fulvons.—Forewing: black outer area extending close to upper angle of cell and posteriorly to near middle of internal margin.—Hindwing: black disco-marginal area wider than in *latona latona*, tawny admarginal interspaces absent, except anal one; median bars C—R<sup>2</sup> heavy, discal interspaces between them and black area paler, median interspaces at proximal side of those bars darker than the rest of the tawny area of the wing.

*Underside* darker than in *latona latona*; median line of black bars obviously bordered white distally, discal interspaces pinkish white proximally from R<sup>2</sup> of forewing to R<sup>2</sup> of hindwing.

♀. The markings in the same position as in the other forms of *latona*, but the black colour very heavy, and the ochraceous colour partly replaced by white.

*Upperside*.—Forewing: basal area dark russet brown; median bars very heavy, bars SC<sup>4,5</sup>—R<sup>2</sup> forming a large black patch; discal and postdiscal interspaces white; discal line of bars separating them well marked, the bars deeply arched; postdisco-submarginal black spots much larger than in *latona latona*, merged together with the marginal line, except the last which is partly separated from the marginal border by a tawny line.—Hindwing: russet tawny; median bars C—R<sup>2</sup> as in ♂, median interspaces dark brown at and near these bars, discal ones white or nearly white proximally; a discal series of six or seven black lunules crosses the wing about midway between cell and black postdisco-submarginal patches, discal luniform bar C—SC<sup>2</sup> in one of the two specimens not separated from the postdisco-submarginal patch; postdiscal interspaces tawny, except interspace SC<sup>2</sup>—R<sup>1</sup>; postdisco-submarginal patches much larger than in all the other forms of *latona*, with minute white centres, all touching one another, except the last two; admarginal interspaces bright tawny ochraceous.

*Underside* differs from that of *latona latona* in the cell of forewing, proximal portions of discal interspaces of both wings, and greater part of submedian interspaces of hindwing, being white; tail broad.

Length of forewing: ♂, 47 mm.

" " " ♀, 53—57 mm.

*Hab.* Neu Hannover, Bismarck Archipelago, 1 ♂, 2 ♀ ♀ (Capt. H. C. Webster, February and March 1897).

*h. Ch. latona gigantea*.

*Charaxes gigantea* Hagen, Jahrb. Nass. Ver. Nat. L. p. 94. n. 161 (1897) (Simbang).

♂. *Wings, upperside*.—Forewing: discal luniform bars separated from the black postdisco-marginal border of the wings by tawny orange halfmoons; the three upper bars heavy, the tawny orange spots at their distal side small, bar R<sup>2</sup>—R<sup>3</sup> indistinct, almost fused with the black border, which is somewhat widened between R<sup>2</sup> and R<sup>3</sup>, bars R<sup>3</sup>—SM<sup>2</sup> orange tawny, about 1 mm. distant from the black border between veins; median bars SC<sup>5</sup>—R<sup>2</sup> midway between cell and discal bars, bars R<sup>2</sup>—M<sup>2</sup> vestigial.—Hindwing: postdisco-submarginal patches R<sup>1</sup>—SM<sup>2</sup> more or less

completely isolated, patches C—R<sup>1</sup> fused with one another, but separated from the black, heavy, marginal line by a small, orange tawny, admarginal spot, the distance from proximal edge of black patches to tip of SC<sup>2</sup> somewhat shorter than the distance from the same point to black median bars; tails very short.

*Underside* much more tawny orange, much brighter, than in *papuensis* and *stephanus*; discal interspaces of fore- and hindwing at outside of median bars partly buff yellow as in ♀♀ of the allied forms; postdiscal interspaces of hindwing wider, and the admarginal ones wax yellow.

♀. *Wings, upperside*, as in *papuensis*, but the discal luniform bars of the forewing more tawny, somewhat thinner, and the marginal line of the hindwing also thinner, more widely separated into lunules at the veins.

On the *underside* the discal lunules of both wings are less blackish, the discal interspaces are more extended pale buff at the median bars, the postdiscal interspaces of both wings and the admarginal ones of the hindwing are wider than in the races from northern and western New Guinea; tails as in *papuensis*.

Length of forewing: ♂, 45 mm.

" " " ♀, 52—54 mm.

*Hab.* Simbang, Huon Golfe, German New Guinea: 1 ♂ (*type*), December 16th 1894 (Dr. Hagen), 1 ♀, January 20th 1895 (Dr. Hagen), 1 ♀ (Capt. Webster).

#### i. *Ch. latona leto*.

*Chiraxes latona leto* Rothschild, Nov. Zool. V. p. 97. n. 2 (1898) (Goodenough; Fergusson).

♂. Agrees with *Ch. latona gigantea*, except in the following particulars:—

*Upperside*.—Forewing: a series of brown discal luniform bars standing  $2\frac{1}{2}$  mm. from the black border of the wing; these bars are extremely faint in *gigantea* and only 1 mm. distant from the black border, which is broader in *gigantea* than in *leto*, bar SC<sup>5</sup>—R<sup>1</sup> twice as wide in *leto*, the tawny orange interspace distal of it larger than in *gigantea*, no tawny orange interstitial spot SC<sup>1</sup>—SC<sup>5</sup>.—Hindwing: postdisco-submarginal black patches smaller, admarginal orange tawny interstices larger, than in *gigantea*.

*Underside*: no small yellowish buff discal patches at outer side of median bars, but ground-colour in discal interspaces of forewing proximally paler than elsewhere; hindwing with a greyish plumbeous gloss, except a marginal and a postdiscal band.

♀. Unknown.

Length of forewing: ♂, 45—47 mm.

*Hab.* D'Entrecasteaux Islands: Goodenough I., 1 ♂ (*type*) (A. S. Meek, December 1896), Fergusson I., 1 ♂ (A. S. Meek, between September and December 1894).

#### j. *Ch. latona meridionalis* Rothschild, subsp. nov.

♂. The specimens in which the discal lunules of the forewing *above* are least isolated (*type*) agree almost with *gigantea*, but can be distinguished by the discal lunules R<sup>2</sup>—M<sup>2</sup>, which are almost completely fused with the black border of the wing, being more black; further, by the median bars C—R<sup>1</sup> of the hindwing being absent or very feeble; the postdisco-submarginal patches C—R<sup>3</sup> of the hindwing are, moreover, fused with the heavy marginal bars, but remain separated from each

other, the veins being tawny; tail somewhat longer than in *gigantea*. In other individuals the discal lunules of the forewing are all separated from the black border of the wing, and all the black postdisco-submarginal patches of the hindwing stand separate from each other and from the marginal bars; such specimens differ very little from *leto*, but the median bars  $SC^1-R^3$  of the forewing *above* are somewhat more proximal, the median bars  $C-R^1$  of the hindwing *above* are feebler, and the posterior postdisco-submarginal patches of the hindwing are comparatively larger.

♀. *Wings above* darker tawny orange in basal region than in *gigantea*, the discal lunules of the forewing almost as in *stephanus*, more blackish than in *gigantea*, and heavier; discal and postdiscal interspaces more orange than in *stephanus*; marginal line of hindwing nearly as in *stephanus*, heavier and blacker than in *gigantea*; tails as in *gigantea* and *papuensis*, longer than in *stephanus*.

*Underside* much darker than in *gigantea*, agreeing with that of *stephanus*, the median and discal interspaces, however, more extended yellow-buff, especially the former.

Length of forewing: ♂, 41—45 mm.

" " " ♀, 51—57 mm.

*Hab.* Milne Bay, Brit. New Guinea, a series of both sexes caught by Mr. A. S. Meek in December 1898, and in January, February, and March 1899.

#### *k. Ch. latona aruanus.*

*Charaxes papuensis* Butler, *Lep. Exot.* p. 15. n. 6, ♀, not ♂, t. 6. f. 4, ♀ (1869) (Aru).

*Charaxes aruanus* Butler, *l.c.* p. 100 (1872) (Aru); Ribbe, *Iris* I. p. 84. n. 80 (1886) (Aru).

*Charaxes latona* Butler, *Journ. Linn. Soc. Lond.* XXV. p. 397. n. 136 (1896) (*sub synon.*; Aru "♀" is ♂ *affinis*).

♂. Unknown to us, no description published anywhere. Most likely similar to the ♂ of *meridionalis* or *papuensis*.

♀. Similar to the ♀ of *Ch. latona papuensis* from N.W. Dutch New Guinea, but differs in the following details:—

*Upperside*.—Forewing a little more falcate, the discal arched bars not black, but tawny orange, only bar  $SC^1-SC^5$  being marked by some black scales, hence these bars much less prominent than in the New Guinea races: postdisco-submarginal patches not touching the narrow black marginal border.—Hindwing: postdisco-submarginal patch  $C-SC^2$  much larger than patch  $SC^2-R^1$ , the other six patches very much smaller than in the average New Guinea ♀; admarginal bars tawny, upper three somewhat blackish, not prominent.

*Underside*: discal arched bars of both wings less black than in the allied races, discal bars  $SC^1-R^1$  of forewing very ill-defined, not being deeper in colour than the ochraceous, triangular patches standing at their proximal side; tawny ochraceous admarginal spots of hindwing ill-defined; tail triangular, 4 mm. long.

Length of forewing: ♀, 48 mm.

*Hab.* Arn, described from the *type* in the Oxford Museum, which Prof. E. B. Poulton kindly sent us for comparison with *females* of *latona* from other localities.

Ribbe collected this species on Arn, but where his specimens have gone to we do not know. The individuals labelled Aru in the Godman-Salvin collection, now in the British Museum, are *affinis*, which occurs only in Celebes.

b. Discal bars of hindwing below less regularly arched, especially the posterior ones, postdiscal series of bars almost straight, hence much farther from outer margin near  $R^3$  than near  $SC^2$ .

a. ♂, hindwing above with a black, scarcely interrupted, admarginal line, penis with a patch of teeth on the right side (Pl. VIII. f. 2. 3); ♀, black postdisco-admarginal patches of forewing above all separated, patch  $SC^3$ — $SC^4$  small, isolated.

#### 4. *Charaxes affinis* (Nov. Zool. VII. t. 11. f. 6. ♀).

- ♂. *Charaxes affinis* Butler, *Proc. Zool. Soc. Lond.* p. 636. n. 58. t. 37. f. 4, ♂ (1865) (Macassar); Honr., *Berl. Ent. Zeitschr.* XXX. p. 131 (1886) (*affinis* ♂, = *wallacii* ♀); Staud., *Eröt. Tagf.* p. 172 (1886) (gynandrom. specim.); Honr., *Berl. Ent. Zeitschr.* XXXII. p. 499. fig. A (1888) (gynandrom. specim.); Rothschild, *Iris* V. p. 438 (1892) (S. Celebes); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 396. n. 135 (1896) (Macassar, Menado; "Ternate" loc. err.).
- Nymphalis affinis*, Kirby, *Cat. Diurn. Lep.* p. 272. n. 50 (1871) (pt.; Celebes).
- Charaxes parmenion* Felder, *Reise Novara, Lep.* p. 439. n. 717 (1867) (Macassar); Butl., *Trans. Ent. Soc. Lond.* p. 120. n. 8 (1870) (*parmenion* = *affinis*).
- Charaxes demonax* Felder, *l.c.* p. 440. n. 718 (1867) (Celebes); Butl., *l.c.* n. 9 (1870) (*demonax* = *affinis*); Jans., *Cruise Marchesi* II. p. 375. n. 56 (1886) (Maros).
- Nymphalis polyxena* var. *C. parmenion*, Kirby, *Cat. Diurn. Lep.* p. 272. sub n. 52 (1871) (Macassar).
- Nymphalis polyxena* var. *C. demonax*, Kirby, *l.c.* (Celebes).
- ♀. *Charaxes wallacii* Butler, *Lep. Eröt.* p. 100. t. 38. f. 2 (1872) (Macassar).
- Charaxes latona* Butler (non Butler, 1865), *Journ. Linn. Soc. Lond.* XXV. p. 397. n. 136 (1896) (*partim*; Macassar; "Aru," "Amboina" loc. err., Aru "♀" is ♂).
- Nymphalis affinis*, Pagenstecher, *Abh. Senck. Naturf. Ges.* XXIII. p. 403. n. 185 (1897) (Celebes).
- Nymphalis latona*, id., *l.c.* p. 404. n. 189 (1897) (Celebes, not "Batjan").

♂ ♀. *Body above*, especially the thorax, less bright tawny orange than the wings, more ochraceous.

♂. *Wings, upperside*, bright tawny orange, abdominal fold for the greater part buff.—Forewing rather falcate, outer edge either nearly entire, or denticulate; posterior half or two-thirds of bar D obsolete; median bars  $SC^5$ — $R^2$  heavy, forming generally triangular patches which are more or less fused with the black outer area, but the second stands sometimes quite isolated, median bar  $R^3$ — $M^1$  seldom clearly marked above, about 6 mm. distant from origin of  $M^1$  (as on underside); black postdisco-marginal area much narrower behind than in front, measuring about 4 mm. at  $SM^2$ ; discal bar  $M^2$ — $SM^2$  present, either heavy and separated from black border of wing by a small tawny orange spot between veins, or feeble and then more or less completely isolated (in all specimens from North Celebes?), bar  $M^1$ — $M^2$  stands also often partly separated from the black border, these discal bars much more distal than the discal bars of the underside; edge of wing with two minute tawny dots between  $M^2$  and  $SM^2$  in the greater number of individuals; fringe white between veins.—Hindwing somewhat variable in shape, anal angle more prominent in some specimens than in others; median bar C— $SC^2$  seldom absent, in some specimens also bar  $SC^2$ — $R^1$  marked; postdisco-submarginal patches C— $R^1$  large, the others small, patch  $SC^2$ — $R^1$  at least 6 mm. long, the black scaling extending, moreover, in many specimens along  $SC^2$  basad for several millimetres, all the other patches separated from one another; white submarginal dots within those patches variable, often partly absent; admarginal line black, sharply marked, separated from edge of wing, at least posteriorly between the veins where it is generally thin, from



C to R<sup>3</sup> it is generally heavy, dilated along the veins and joined to, or partly fused with, the postdisco-submarginal patches ; upper tail acute, 3 to 4 mm. long, second very short, sometimes not so much prominent as the teeth SC<sup>2</sup>—R<sup>2</sup>.

*Underside* : varying from ochraceous to ochre yellow, the glossy parts appearing darker (slaty grey) in side light, the discal interspaces lighter at the median bars, all the bars much thinner than in *latona*.—Forewing : submedian bar M<sup>1</sup>—M<sup>2</sup> rather oblique, bar M<sup>2</sup>—(SM<sup>1</sup>) about midway between base of M<sup>2</sup> and bar M<sup>1</sup>—M<sup>2</sup>, often also oblique, bar R<sup>3</sup>—M<sup>1</sup> always about (in both sexes) ; discal bars more distal than in *latona*, less arched, the series not interrupted at R<sup>2</sup> ; postdiscal patches very obscurely marked, with ill-defined, white patches at their distal side, of which the middle ones are mostly very feeble ; upper cell-bar curved twice, the middle portion pointing distad, basal cell-spot at least vestigial, costal margin somewhat greyish at base.—Hindwing : median series of bars much broken, none of the bars contiguous, bar R<sup>3</sup>—M<sup>1</sup> several millimetres distant from base of M<sup>1</sup>, not standing very far from the discal series, bar R<sup>2</sup>—R<sup>3</sup> much more distal than bar R<sup>1</sup>—R<sup>2</sup>, the discal interspace, therefore, not half the width between R<sup>2</sup> and M<sup>1</sup> as between C and R<sup>2</sup> ; discal bars much less arched than in *latona*, the posterior ones almost straight, the series not parallel to outer margin of wing, it being slightly curved basad from C—R<sup>3</sup> and then running nearly straight to SM<sup>3</sup>, which it reaches close to anal angle ; postdiscal bars indistinct, represented by blackish, ill-defined, feebly curved lunules, interspace between them and the discal bars tawny outwardly, more yellow proximally ; admarginal blackish brown line thin, but well-defined, not touching edge of wing, sometimes interrupted at veins.

♀. Often confounded with the ♀ of *latona*.

*Wings, upperside*.—Forewing : outer margin more concave than in *latona* ; median bars SC<sup>3</sup>—R<sup>2</sup> less enlarged than in *latona*, somewhat more distal ; discal luniform bars more distal than in *latona* and also much more distal than the discal bars of the underside, which show through, the upper ones more or less enlarged ; postdisco-submarginal patches more triangular than in *latona*, closer to edge of wing, often fused with the black-brown margin ; marginal line much thinner than in *latona*, very indistinctly defined, the pale tawny orange colour extending close to the fringe at the veins.—Hindwing : median bars C—SC<sup>2</sup> always (?), SC<sup>2</sup>—R<sup>1</sup> mostly present, bar R<sup>1</sup>—R<sup>2</sup> seldom distinctly marked, disc outside these bars often very pale ; discal lunules shining through from below ; there is often a very indistinct, band-like, dark shade from the inner edge of the upper postdisco-submarginal patches straight to anal angle, corresponding to the black postdiscal band of the underside, this shadowy band sometimes ending in a conspicuous blackish half-moon at anal angle ; postdisco-submarginal patches closer to margin than in *latona*, the posterior ones always small, the middle and upper white submarginal dots seldom obliterated ; admarginal line thin, but well-defined, broken up into slightly arched lunules, the upper ones heavier ; upper tail spatulate, 7 mm. long, second a very short and blunt tooth.

*Underside* : discal interspaces of both wings, the greater part of the postdiscal and submedian interspaces of the forewing ochre yellow, median interspace of both wings more or less brown ; bars thinner than in *latona*.—Forewing : submedian bar M<sup>1</sup>—M<sup>2</sup> always considerably more distal than submedian bar M<sup>2</sup>—(SM<sup>1</sup>), and median bar R<sup>3</sup>—M<sup>1</sup> much more so than median bar M<sup>1</sup>—M<sup>2</sup> ; discal luniform bars less deeply arched than in *latona*, more distal in position ; postdisco-submarginal spots much shaded with white scales, consisting generally of a blackish proximal

(postdiscal) dot or dash which is separated from a similar, but less obvious, spot by whitish scales; from the postdiscal dots extend basad fine, yellow, lines situated at the internervular folds  $R^3-SM^2$ , these lines sometimes very faint.—Hindwing: discal interspace very much narrowed between  $R^2$  and  $M^1$ , the median bars  $R^2-M^1$  not far from the discal series, especially bar  $R^3-M^1$ ; discal bars luniform, the posterior ones very feebly arched, the series very slightly convex from  $SC^2-M^1$ , reaching  $SM^2$  much nearer tip of that vein than in *latona*; postdiscal bars slate-black, much less arched than in *latona*, the series almost straight.

Length of forewing: ♂, 38—44 mm.

„ „ ♀, 50—53 mm.

*Hab.* Celebes, 23 ♂♂, 7 ♀♀ in the Tring Museum from South Celebes : Maros country (W. Doherty, August—September 1891), Patunngang (H. Fruhstorfer, January 1896); Macassar (Wallace); Menado (Dr. Meyer); North Celebes : Minahassa (Dr. Platen), Toli-Toli (H. Fruhstorfer, November—December, 1895), Dongala, north of Palos Bay (W. Doherty, August—September 1896).

There are two specimens in the Felder collection which are labelled "Amboina, Lorquiu." The British Museum received from the Godman and Salvin collection also a specimen of *affinis* from "Amboina," another from "Arn" (both standing in Dr. Butler's Revision of *Charaxes* under *latona*!!), and a third from "Ternate." All these specimens are identical with *affinis*, and those localities are certainly erroneous. We know from experience that the material *bought* by travellers in the Dutch East Indies from captains, natives or dealers, is often wholly unreliable as regards localities, specimens from different islands being often mixed together; we have found Javanese species among material from Amboina, Celebes species in a lot from Java, Java examples in a collection said to be from Timor, etc., forms of which we are absolutely certain that they do not occur in the localities from which the specimens were said to come. Nobody will convince us that *Ch. affinis* occurs on Ternate, Amboina and Arn, unless he is able to show authentic specimens, collected recently by careful scientists.\*

Felder's *Ch. demonax* is identical with *affinis* and not a *var.*, as Dr. Butler says (*l.c.*); Felder's *parmenion*, erroneously said by Dr. Butler (*l.c.*) to be a synonym of *latona*, is also *affinis*, but differs from the average specimen of *affinis* in the anal angle of the hindwing being more produced, and in the second tail being scarcely indicated.

The *males* of *affinis* are easily distinguished from all more western species by the black admarginal line of the hindwing and the structure of the penis; from *latona*, moreover, by the pattern; the *female* resembles somewhat the *female* of *latona*, but the spatulate upper tail, the extremely short second tail, and the different position of the discal lunules of the *upperside* of the forewing and of the discal and postdiscal lunules of the *underside* of the hindwing are characters by which *affinis* can readily be recognised.

A ♂ in the Tring Museum without locality, but clearly belonging to *affinis* according to pattern and penis, has all the tawny postdiscal interspaces of the forewing vestigial, the specimen somewhat resembling in this character *Ch. aristogiton*.

\* Professor Kükenthal seems to have bought up a great many of the Lepidoptera recorded by Dr. Pagenstecher, &c.; the list furnishes illustrations of what we said above, and should be used with caution.

b<sup>8</sup>. ♂, hindwing above with the admarginal line feebly marked, tawny, or, if black, interrupted at the veins, penis without a lateral patch of teeth or this patch is on the left side; ♀, postdisco-admarginal patches of forewing above more or less merged together, at least the upper ones.

a<sup>9</sup>. ♂, postdiscal tawny interspace  $R^2-R^3$  of forewing above at least as large as the black (or tawny) bar standing at its proximal side, or the tawny interspaces  $R^1-M^2$  small but present and both tails developed; ♀, discal bar  $R^1-R^2$  of forewing above not much heavier than posterior discal bars, much closer to outer margin than to median bar  $R^1-R^2$ , or, if heavy, the hindwing with two tails and the median interspaces  $SC^5-R^2$  not black. *Marmar* group.

##### 5. *Charaxes distanti*.

*Charaxes distanti* Honrath, *Berl. Ent. Zeitschr.* XXIX. p. 277 (1885) (Perak: Borneo); Dist., *Rhop. Mal.* p. 434. n. 12. t. 36. f. 2, ♂ (1886); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 398. n. 143 (1896) (Borneo); Hagen, *Iris* IX. p. 187. n. 251 (1896) (N.E. Sumatra).

*Charaxes (Haridra) distanti*, Nicéville & Martin, *Journ. As. Soc. Beng.* LXIV. 2. p. 438. n. 265 (1895) (N.E. Sumatra; Middle Tenasserim).

♂ ♀. *Underside* of palpi, and middle of pro- and of anterior portion of mesosternum, almost pure white; sides of sterna of the colour of the wings; underside of abdomen often slightly paler.

♂. *Wings, upperside*: markings tawny, not black, which gives the wings a uniform appearance.—Forewing: median bars  $R^2-M^1$  mostly marked, bar  $R^2-M^1$  mostly angle-shaped, bars  $SC^5-R^2$  heavier, darker, the upper of the two oblique, forming an angle-shaped spot together with the streak-like bar  $SC^4-SC^5$ ; discal bars luniform, the posterior ones often ill-defined, washed out, lunule  $R^3-M^1$  7 to 9 mm. from edge of wing (between veins), upper bars widened basad and also more or less broadly connected along the veins with the brown postdisco-submarginal patches; of the latter the middle ones often reach the edge of the wing, patches  $R^3-SM^2$  about as wide as, or smaller than, the interspaces between them and the discal lunules.—Hindwing: outer area from edge of wing as far as the postdiscal bars, which shine through from below, darker tawny orange than the rest of the wing, costal margin somewhat whitish; median bar  $C-SC^2$  straight, or slightly arched, often faintly marked, median bar  $SC^2-R^1$  mostly absent, sometimes vestigial; postdisco-submarginal patches all small, the postdiscal portions (proximal of the white dots) obliterated, except between C and  $R^2$  where they are more or less clearly marked, sometimes nearly all the patches reduced to minute spots, the last two dots more black than the others; admarginal line separated into lunules, mostly rather clearly defined, seldom shadowy; tails reduced to short teeth.

*Underside* varying from orange ochraceous rufous to yellowish ochraceous; bars tawny or ochraceous tawny, postdiscal series of hindwing mostly slaty black.—Forewing: costal margin to a little beyond apex of cell white; basal dot of cell absent, cell-bar 3 never entire, broken up into dots, the dots, however, often all fused together, sometimes the posterior dots obliterated, the bar, if nearly entire, heavier than the other cell-bars, cell-bar 4 often straight, reaching M at or before, never distally of, point of origin of  $M^1$ ; median bars  $R^2-SM^2$  stand in an oblique, almost continuous, series, bar  $R^2-R^1$  exactly (or almost) in front of bar  $R^3-M^1$ ; the discal interspaces narrowing behind: white submarginal scaling band-like, the

apical patches often much smaller than those towards internal angle.—Hindwing : the two cell-bars converging in front, here often fused together ; the upper post-discal bars are lnniform, more or less completely fused to a nearly straight band ; white submarginal dots all prominent.

♀. Like ♂, larger, the disc of the wings very slightly paler, the postdisco-submarginal spots and the white submarginal dots of the hindwings larger, the admarginal interspaces of the hindwing below more wax-yellow ; tails as short as in ♂.

Length of forewing : ♂, 41—46 mm.

" " " ♀, 52 mm.

*Hab.* Tenasserim and Sumatra to Borneo. In the Tring Museum from : Dawnat Range, Tenasserim, March 1895 (Hauxwell), 1 ♂ : Perak, 1 ♂, 1 ♀ (Kinta distr., coll. by Mr. Goldham) ; N.E. Sumatra, 9 ♂♂ : Selesseh, January, April, May, June, August (Dr. Martin) ; Bunguran, Natuna Islands, 2 ♂♂ (Hose, July—September 1894) ; Borneo, 10 ♂♂ : Lawas, April 1892 (A. Everett), Mt. Dulit, February and March 1894 (Hose), Kina Balu, Pengaron (S.E. Borneo).

A ♀ from Borneo in Mr. Grose Smith's collection.

The Bornean ♂♂ have the underside more tawny than the specimens from Sumatra, Perak and Tenasserim ; one only of the Bunguran ♂♂ agrees in this respect with the Bornean ones, the other being paler. Specimens that have been on the wing for a longer time have the underside apparently paler than fresh ones.

The Tenasserim example in the Tring Museum is the smallest of all specimens we possess of the species ; the discal lunules of the forewing are very obscurely marked, washed out (as they sometimes are in Bornean specimens), the admarginal line of the hindwing is also very indistinct, and the tawny submarginal spots are minute.

Dr. Hagen (*l.c.*) received about a dozen specimens from his collectors who brought them from the Gajo country, while Dr. Martin (*l.c.*) found it "in the forests of the plains, at Paya Bakong and Selesseh, perhaps not higher than Namoe Oekor."

## 6. *Charaxes kahruha*.

*Charaxes (Haridra) lunawarra*, Doherty (non Butler, 1872), *Journ. As. Soc. Beng.* LV. 2. p. 124. n. 96 (1886) (Kumaon) ; Wood-Mas. & Nicéville, *ibid.*, p. 363. n. 103 (1887) (Cachar, July) ; Nicéville, in Risley, *Gazetteer of Sikkim* p. 148. n. 235 (1894) (Sikkim).

*Charaxes lunawarra*, Nicéville, *Bull. of India* II. p. 282. n. 572 (1886) (Kumaon ; Sikkim ; N.E. Bengal ; Cachar) ; Elwes, *Trans. Ent. Soc. Lond.* p. 368. n. 213 (1888) (Sikkim) ; *id.*, *Proc. Zool. Soc. Lond.* p. 284 (1891) (Karen Hills, Burma).

*Haridra lunawarra* (1), Swinhoe, *Trans. Ent. Soc. Lond.* p. 289. n. 195 (1893) (Khasia Hills).

*Haridra kahruha* Moore, *Lep. Ind.* II. p. 235. t. 171. f. 1. 1a. 1b. 1c. ♂, ♀ (1896) (Sikkim ; Assam ; Burma ; Tenasserim).

*Charaxes kahruha*, Butler, *Journ. Linn. Soc. Lond.* XXV. p. 398. n. 141 (1896) (Sikkim ; Bhutan ; Assam ; Burma).

Differs from the allied species constantly in a number of characters, and is most easily recognised by the strongly pronounced markings of the underside.

♂. *Wings, upperside*.—Forewing : discal halfmoons  $R^2$ — $M^2$  sharply defined, black or dark tawny, the upper discal bars  $SC^1$ — $R^2$  much heavier, bars  $SC^1$ — $R^1$  joined along veins to the black border of the wing ; postdiscal, halfmoon-shaped interspaces slightly deeper in tint than the middle of the wing, the upper three smaller than the others, interspace  $SC^4$ — $SC^5$  isolated, more or less elongate, never



absent; admarginal tawny orange interspace  $M^2-SM^2$  always well marked, sometimes connected along ( $SM^1$ ) with the postdiscal interspace, the other admarginal interspaces vestigial *between* veins; median bars  $SC^5-R^2$  generally rather heavy, black, seldom tawny.—Hindwing: submedian bar  $C-SC^2$  present, though not heavy; median bar  $C-S^2$  always conspicuous, oblique, slightly S-shaped; postdisco-submarginal black patches with the white dots generally obsolete, the dots, if better marked, of a buffish-colour, not pure white, patch  $SC^2-R^1$  at least twice the size of patch  $C-SC^2$ , veins  $C$  and  $SC^2$  often black near these patches, the following three patches, rhomboidal, well separated from one another: marginal tawny line more clearly defined than in the allies of *kahruba*: edge of wing dentate, upper tail 3 to  $3\frac{1}{2}$  mm.

*Underside* maize yellow, this colour strongly contrasting with the russet-tawny colour of the median interspaces  $R^2-M^2$  of forewing, of all the median interspaces of hindwing, the postdiscal interspaces of the hindwing and of the small triangular patches at the proximal side of the discal lunules of fore- and hindwing.—Forewing: basal cell-spot always present, heavy; cell-bar 3 heavy, sometimes interrupted; bar D very heavy; subbasal bar  $M^2-(SM^1)$  sometimes vestigial; submedian bar  $M^1-M^2$  just behind point of origin of  $M^2$ , or more distal, bar  $R^2-R^1$  barely 1 mm. distant at  $R^3$  from bar D, often fused with the latter behind; median bar  $M^1-M^2$  angle-shaped, bar  $R^3-M^1$  much more distal, the median interspace  $M^1-M^2$  barely half the width of median interspace  $M^2-(SM^1)$ ; postdiscal interspaces  $R^1-SM^2$  with rather large tawny patches; brown, postdiscal, short streaks upon internervular folds, followed by white scaling which is distally limited by a brown line, of which the partitions between veins are not obviously uniform.—Hindwing: subbasal interspaces more or less tawny russet; submedian interspaces partly of the same colour, but a spot in cell at cell-bar 4 and interspaces  $CM-SC$  maize-colour; basal costal bar closer to  $PC$  than in the allied species, long, S-shaped, basal cell-spot marked in all specimens; subbasal, submedian and median bars heavy, but costal subbasal bar mostly absent, seldom vestigial; cell-bar 3 represented by a black dot, which is sometimes absent; subbasal, submedian and median bars  $M-(resp. M^2)-SM^3$  form continuous zigzag lines; a black line upon  $SM^2$  between submedian and median bars, another at base of abdominal margin of wing: median bar  $R^3-M^1$  much more distal than the lower end of bar  $R^2-R^3$  and upper end of bar  $M^1-M^2$ ; postdiscal interspaces russet tawny except at discal lunules: postdiscal bars black, arrowhead-shaped; admarginal interspaces wide, maize-colour; marginal, tawny, line sharply defined, scarcely thinner near veins than between.

♀. Differs from the allied species in the same way as the ♂ does.

*Wings above* somewhat paler on disc than in ♂.—Forewing: discal lunules  $SC^4-R^2$  not much heavier than the others; postdisco-submarginal patches more or less indistinctly separated from one another, the veins between them being tawny; admarginal tawny interspaces more obvious than in ♂, at and *between* veins; median bar  $R^3-M^1$  more distal than in the allied species, bar  $R^2-R^3$  more proximal.—Hindwing: the white submarginal dots within the black postdisco-submarginal patches all developed, the middle one rather strongly angle-shaped; dark tawny marginal line broader than in ♂; upper tail  $8\frac{1}{2}$  to  $10\frac{1}{2}$  mm.

*Underside* as in ♂, but the forewing has the middle discal lunules somewhat more proximal, and the postdiscal interspaces much less variegated with tawny russet.

Length of forewing : ♂, 41—45 mm.

" " " ♀, 47—56 mm.

The penis is very strongly denticulate (Pl. VIII. f. 4), the number of teeth is large ; they stand in an irregular double or treble series which widens out proximally into a sinistral-lateral patch ; penis-funnel long and slender.

*Hab.* Kumaon to Tenasserim. In the Tring Museum 17 ♂♂, 9 ♀♀ from : Sikkim, the Khasia, Naga, and Garo Hills.

The species is rarer than *Ch. marmar*. It was generally considered to be *lunawara*, until Moore pointed out that *lunawara* was nothing else but *marmar*. In Sikkim it is met with at lower elevations. Doherty found it to be rare in the Lower Kali valley, Kumaon.

### 7. *Charaxes marmar*.

*Charaxes marmar* Westwood, *Cat. Or. Ent.* p. 43. t. 21, ♂, ♀ (1848) (Assam ; Sylhet) ; Butl., *Proc. Zool. Soc. Lond.* p. 636. n. 57 (1865) (Assam ; Silhet) ; Moore, *ibid.*, p. 831 (1878) (Moolai, Upp. Tenasserim, 3—6000 ft.) ; Nicév., *Butt. of India* II. p. 281. n. 571 (1886) (Sikkim ; Assam ; Sylhet ; Upp. Tenass.) ; Elwes, *Trans. Ent. Soc. Lond.* p. 368. n. 212 (1888) (Sikkim) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 398. n. 140 (1896) (Darjiling ; Silhet ; Khasia Hills ; Buxa ; Mungphu ; East Pegu).

*Nymphalis marmar*, Doubleday, Westwood & Hewitson, *Gen. Diurn. Lep.* II. p. 309. n. 37 (1850) (Silhet ; Assam) ; Horsf. & Moore, *Cat. Lep. Mus. E. I. Comp.* I. p. 206. n. 422 (1857) (Darjiling ; Cherra Punji).

*Nymphalis polyxena* var. *k. C. marmar*, Kirby, *Cat. Diurn. Lep.* p. 272. sub n. 52 (1875) (Ind. bor.). *Charaxes lunawara* Butler, *Lep. Exot.* p. 99. t. 37. f. 2, ♂ (1872) (N.E. Bengal ; ♀ = *anyceus carolus*).

*Nymphalis (Haridra) marmar*, Wood-Mason & Nicéville, *Journ. As. Soc. Beng.* LV. p. 306. n. 102 (1887) (N. Cachar, Silcuri, June—July) ; Nicév., in Risley, *Gazetteer of Sikkim* p. 148. n. 234 (1894) (Sikkim, April to October).

*Nymphalis polyxena* var. *marmar*, Robbe, *Ann. Soc. Ent. Belg.* XXXVI. p. 130. n. 53 (1892) (Darjiling ; Kurseong).

*Haridra marmar*, Swinhoe, *Trans. Ent. Soc. Lond.* p. 289. n. 194 (1893) (Khasia Hills) ; Moore, *Lep. Ind.* II. p. 233. t. 170. f. 1. 1a. 1b. 1c. ♂, ♀ (1896) (Sikkim, Bhotan, to Tenasserim ; Mal. Pen.).

♂. *Wings above*.—Forewing : median bars  $SC^1$ — $R^1$  midway between apex of cell and the respective discal bars, in the specimens which have the latter much enlarged a little nearer these black discal patches ; discal luniform bars  $R^1$ — $SM^1$  tawny ochraceous, seldom blackish ; postdiscal tawny orange interspaces  $SC^1$ — $SC^5$  sometimes very small, but apparently never quite replaced by black ; admarginal tawny line generally developed behind and near apex, much less in middle of margin, where the tawny colour appears often only at the tip of the veins, or is quite absent.—Hindwing : postdisco-submarginal patches very variable in size, the middle ones pointed externally, postdiscal portions of these smaller than submarginal ones, white submarginal dots sometimes absent, the second the last to disappear : marginal line indistinct ; tails short, upper one  $1\frac{1}{2}$  to 4 mm., dentition of edge of wing sometimes feebly developed.

*Underside* pale ochre yellow, median interspaces  $R^2$ — $M^2$  of forewing, all the median interspaces as well as the middle, submedian and subbasal ones of the hindwing more or less pale russet tawny.—Forewing : median interspace  $M^1$ — $M^2$  half the width of interspace  $M^2$ —( $SM^1$ ) ; median bar  $R^2$ — $R^3$  more proximal than bar  $R^3$ — $M^1$ , bar  $R^1$ — $R^2$  touching  $R^2$  midway between the median and discal bars  $R^2$ — $R^3$ .—Hindwing : basal costal bar halfway between base of wing and PC, not reaching C ; no vestige of cell-bar 3 ; upper lunules of postdiscal series much less distinct

than the others ; marginal line indistinct or, at least, not conspicuous ; postdisco-submarginal interspaces glossy, pinkish buff or vinaceous buff ; discal interspaces not glossy.

♀. Discal interspaces of upper- and underside somewhat paler than in ♂ ; median bars of forewing *above* often patch-like, closer to cell than to discal bars ; discal bars more blackish than in ♂, the upper ones not (or little) heavier than the others. —Hindwing : white submarginal spot within postdisco-submarginal patches all developed, the upper one often obsolete, never larger than the second.

*Underside* : postdiscal slate-black bars of hindwing heavier than in ♂, the upper ones more uniform than the others ; tail 8 to 10 mm. long.

Length of forewing : ♂, 37—44 mm.

" " " ♀, 49—55 mm.

Penis with few teeth above, but with a lateral patch of teeth about 3 mm. from the apex (Pl. VIII. f. 5) ; penis-funnel long, slender, its extremity convex above.

*Hab.* Sikkim to Malacca and Tonkin. In Tring Museum 29 ♂♂, 15 ♀♀ from : Sikkim ; Khasia Hills ; Garo Hills ; Naga Hills ; Katha, Burma ; Theiping, Mal. Pen. ; Tonkin.

A common species at lower altitudes, occurring in Sikkim from April to October ; apparently not varying according to season.

### 8. *Charaxes aristogiton*.

*Charaxes aristogiton* Felder, *Reise Novara, Lep.* p. 444. n. 727 (1867) (*hub.* ?) ; Butl., *Trans. Ent. Soc. Lond.* p. 121. n. 18 (1870) (Sikkim) ; Nicév., *Butt. of India II.* p. 282. n. 573 (1886) (Sikkim ; Sylhet ; Upp. Tenasserim) ; Manders, *Trans. Ent. Soc. Lond.* p. 526. n. 93 (1890) (Shan States) ; Adams, *Cat. Butt. Burma* p. 20. n. 207 (1889) ; Nicév., *Journ. Bombay N. H. Soc.* V. p. 296. n. 50 (1890) (Chin Lushai) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 397. n. 139 (1896) (Darjiling ; Upp. Tenasserim).

*Nymphalis polyxena* var. *C. aristogiton*, Kirhy, *Cat. Diurn. Lep.* p. 273. sub n. 52 (1895).

*Charaxes desa* Moore, *Proc. Zool. Soc. Lond.* p. 832. (1878) (Moolai ; Upp. Tenass.).

*Charaxes aristogiton* (!), Elwes, *Trans. Ent. Soc. Lond.* p. 368. n. 214 (1888) (Sikkim).

*Haridra aristogiton* (!), Swinhoe, *ibid.*, p. 289. n. 196 (1893) (Khasia Hills).

*Charaxes (Haridra) aristogiton*, Nicéville, in Risley, *Gazetteer of Sikkim* p. 148. n. 236 (1894) (Sikkim) ; *id.*, *Journ. As. Soc. Beng.* LXVI. p. 552. n. 8. t. 2. f. 11. 12 (1897) (*syn. pro parte* ; gynandromorph. spec.).

*Haridra aristogiton*, Moore, *Lep. Ind. II.* p. 236. t. 173. f. 1. 1a (1896) (Sikkim ; Bhotan ; Naga Hills ; Sylhet).

*Haridra desa* Moore, *l.c.* p. 235. t. 172. f. 1. 1a. 1b. 1c. ♂, ♀ (1896) (Tenasserim : Moolai, Toungoo, Thoungyeen).

*Haridra adamsoni* Moore, *l.c.* p. 236. t. 173. f. 2. 2a. ♂ (1896) (Mepley Valley, Upp. Tenass., Feb.).

♂. *Wings, upperside*.—Forewing : discal bars  $R^2$ — $SM^2$  brownish black, uniform, bars  $SC^4$ — $R^2$  very heavy, fused with one another and with the postdisco-submarginal band, also prolonged basad along veins towards median bars  $SC^4$ — $R^2$ , which are sometimes reached ; postdiscal, tawny, halfmoon-shaped interspaces  $R^1$ — $M^2$  about half the breadth (or less) of the respective postdisco-submarginal patches, interspaces  $R^1$ — $R^3$  much smaller, sometimes vestigial, interspace  $SC^6$ — $R^1$  vestigial, or filled up with black, interspace  $SC^4$ — $SC^5$  very seldom vestigial ; edge of wing as in *marmax*.—Hindwing : postdisco-submarginal black spots  $C$ — $R^1$  fused together, sometimes extended to edge of wing, the vein between them very rarely tawny ; the white submarginal spots as in *marmax*, but the first on the whole larger and the last of the upper ones to disappear (while in *marmax* the second is the last to disappear).

*Underside* more or less uniformly pale vinaceous russet, the discal interspaces of the forewing and the discal and admarginal ones of the hindwing a little more clay-colour.—Forewing : interspace between median bars  $M^1-M^2$  about one-third narrower than interspace between bars  $M^2-(SM^1)$ , median bar  $R^2-R^3$  continuous with bar  $R^3-M^1$ , not much more proximal (as it is in *marmax*), costal edge more or less obviously scaled white at base.—Hindwing : basal costal bar placed as in *marmax*; median bars  $R^2-M^1$  continuous; rest as in *marmax*; discal interspaces glossy.

♀. *Wings, upperside*.—Postdiscal, tawny interspaces of forewing narrower than in *marmax*, especially the upper ones; the first white submarginal dot of the hindwing larger than the second.

*Underside* as in ♂; median bar  $R^1-R^2$  of forewing much closer to median bar  $R^2-R^3$  than to discal bar  $R^2-R^3$ ; first and second white submarginal spot wider apart from the respective postdiscal slate-black bars than in *marmax*, the white spot C— $SC^2$  well marked, without blackish bar at distal side (the bar present in *marmax*).

Penis with rather heavy denticulation above, but without the lateral patch of teeth which is found in *marmax*; penis-funnel much shorter than in *marmax*, its upperside concave to tip.

*Hab.* Sikkim to Tenasserim. In the Tring Museum 21 ♂♂, 4♀♀ from: Sikkim; Khasia Hills, Naga Hills; Katha, Burma; S. Shan States, Siam frontier; Toungoo, April.

The specimens from Tenasserim have the discal bar  $R^1-R^2$  thinner than the individuals from N. India, the bar not being much wider than the tawny postdiscal spot at its distal side; in these examples the black area is suddenly dilated in front, but the black scaling is not so much extended as in the North Indian individuals; the median bars  $SC^1-R^2$  stand about midway between the cell and the black outer area in the Tenasserim specimens. In the *female* sex from the same country the discal bars  $SC^1-R^1$  are much wider (according to Moore's figure) than in *females* from North India. Dr. F. Moore considers these Tenasserim specimens to be specifically distinct from *aristogiton*, and calls them *desa*. It is possible that *desa* represents, indeed, a geographical form of *aristogiton*. The penis and penis-funnel are as in *aristogiton*.

The specimens of *marmax* and *aristogiton* from North India are easily distinguished from one another by the colour of the underside of the wings, the shape of the penis-funnel and the denticulation of the penis; intergradations do not seem to occur either in Sikkim or Assam. From an examination of North Indian material only one must, therefore, necessarily arrive at the conclusion that *marmax* and *aristogiton* are two distinct species. But the matter becomes complicated, if one takes into consideration the specimens from the Shan States and Tenasserim. In these countries there occur, besides ordinary *aristogiton*, individuals which combine characters of *marmax* and *aristogiton*, specimens which, besides, vary *inter se* very much, and exhibit sometimes characters not found either in *marmax* or *aristogiton*. The following specimens (♂♂) of the size of our smallest *marmax* and *aristogiton*, or even smaller, are in the Tring Museum:

(1) A specimen from Muong Gnow, Shan States, caught in the second half of the year.

*Wings, upperside*.—Forewing : median bars  $SC^1-M^1$  not marked; bar D



feeble, tawny ; discal bars  $R^2$ — $SM^2$  feebly curved, closer to postdisco-submarginal patches than in *aristogiton*, fused with them at veins (except at  $SM^2$ ), discal bars  $SC^4$ — $R^2$  much enlarged, extending basad at veins to near the median bars which shine through from below in certain lights, postdiscal tawny spots smaller than in *aristogiton*, spot  $SC^4$ — $SC^5$  absent, the following one vestigial, the third somewhat larger, the dark scaling separating it from the tawny orange area tawny brown between veins ; tawny admarginal spots obsolete, except the last, represented by some tawny scales *between* veins as in *kahruba*.—Hindwing : all the postdisco-submarginal spots separated from one another, the first like the second,  $4\frac{1}{2}$  mm. long, with heavy white centres, the other spots all very much smaller, with white dots, admarginal line indistinct ; a trace of a wax-yellow spot at anal angle, found sometimes in *aristogiton*.

*Underside* as in *marmax*, the median interspaces less prominent ; median interspace  $M^1$ — $M^2$  of forewing as wide as in *aristogiton*, upper tail  $4\frac{1}{2}$  mm.

Penis as in *marmax*, but the lateral patch of teeth just indicated ; penis-funnel as in *marmax*.

Length of forewing : 38 mm.

(2) The same locality and time of the year as No. 1.

*Wings, upperside*.—Forewing : median bars  $SC^5$ — $M^2$  feebly marked, bar D black costally ; discal bars and postdiscal tawny interspaces as in No. 1, but the upper interspaces somewhat larger and less shaded with brown, discal, patch-like, bar  $R^1$ — $R^2$  black, not dark tawny between veins ; admarginal orange-tawny line well developed as in ordinary *marmax* and *aristogiton*.—Hindwing : as in No. 1, tail a little shorter, yellow spot at anal angle distinct, submarginal white dots a little smaller.

*Underside* of the tint of *aristogiton*, but admarginal interspaces of both wings as yellow as in *marmax*, discal interspaces also with a trace of the yellow colour of *marmax* ; median bar  $R^2$ — $R^2$  of forewing and  $R^3$ — $M^1$  of hindwing placed as in *marmax*, median interspace  $M^1$ — $M^2$  of forewing as white as in *aristogiton*, submarginal, blackish, bar C— $SC^2$  of hindwing marked, but placed as far from the white submarginal dot as in *aristogiton*, cell-spot 3 of hindwing present (as in most specimens of *kahruba*).

Penis above denticulated as in *aristogiton*, but the lateral patch of teeth present ; penis-funnel as in *aristogiton*.

Length of forewing : 37 mm.

(3) A specimen from Chiengkong, S. Shan States, Siamese frontier, March (ex coll. Watson).

*Wings, upperside*.—Forewing as in No. 2, but median bars more distinct, discal bar  $R^1$ — $R^2$  as in No. 1, and postdiscal tawny spot  $SC^4$ — $SC^5$  present, postdisco-submarginal, black, patches somewhat heavier, orange-tawny line obsolete in middle. —Hindwing with the postdisco-submarginal patches larger than in Nos. 1 and 2, the upper two not separated, the others touching one another (except the last three), white dots C— $R^1$  obscure, the following four absent ; edge of wing less sharply dentate than in Nos. 1 and 2.

*Underside* as in *aristogiton* ; tail short, 2 mm. long.

Penis and penis-funnel as in *aristogiton*.

Length of forewing : 37 mm.

(4) A specimen from the Salween Valley, N. Shan States, 3000 ft. (ex. coll. Watson).

*Wings, upperside*.—Forewing as in *marmax*, median bars  $SC^5$ — $R^2$  very thin. —Hindwing: postdisco-submarginal patch  $C$ — $SC^2$  with white dot, the following without white dots, second patch one-fourth larger than the first, patches  $R^1$ — $M^2$  gradually diminishing in size.

*Underside* as in *aristogiton*, median bar  $R^2$ — $R^3$  of forewing closer to cell, admarginal region of hindwing more yellow; upper tail short, very broad at base, second tail scarcely indicated, dentition of wing obsolete.

Penis with some lateral teeth, dorsal teeth as in *marmax*, penis-funnel as in *aristogiton*.

Length of forewing:  $35\frac{1}{2}$  mm.

(5) A specimen without locality agrees with No. 4, it has, however, the outer edge of the forewing more extended tawny yellow, the underside a little more variegated with yellow; cell with dot 3 present. Penis feebly denticulated above, without lateral patch of teeth, penis-funnel as in *aristogiton*.

(6) A specimen labelled "Shan States?" has the median bars of the forewing *above* well-marked; the discal interspaces are paler than in *marmax* and *aristogiton*; postdiscal tawny orange spots and discal bars as in *aristogiton*, but tawny spot  $SC^4$ — $SC^5$  marked, margin all black, except before  $SM^2$ , the tawny colour faintly vestigial between veins. The postdisco-submarginal patches all large as in No. 3, second only with a distinct white dot.

*Underside* as in No. 2, but admarginal interspaces less yellow; tail short, dentition not obsolete.

Penis nearly as in *marmax*.

Length of forewing: 39 mm.

Moore's *adamsoni* is based upon a single specimen from the Mepley Valley, Upper Tenasserim, resembling specimen (2); the tawny interstitial spots  $SC^5$ — $R^2$  of the forewing above are completely isolated, the black postdisco-submarginal patches  $C$ — $R^1$  of the hindwing have no white centres and spots  $R^1$ — $SM^2$  are minute.

## 9. *Charaxes harmodius*.

*Charaxes harmodius* Felder, *Reise Novara*, *Lep.* p. 445. n. 726 (1867) (Java); Fruhstorff, *Ent. Nachr.* XXIV. p. 57 (1898).

*Charaxes seylax*, Butler (non Felder, 1867), *Journ. Linn. Soc. Lond.* XXV. p. 397. n. 137 (1896) (Java).

*Charaxes (Haridra) aristogiton*, Nicéville, *Journ. As. Soc. Beng.* LXVI. 2. p. 552. n. 8 (1897) (partim).

♂. *Wings above* similar to those of *Ch. marmax*.—Forewing: discal luniform bars  $R^2$ — $SM^2$  thin, the posterior ones often obsolete, bars  $SC^4$ — $R^2$  varying in width, the uppermost one often completely fused with the postdisco-submarginal patches; postdiscal interspaces  $SC^3$ — $SM^2$  always developed, the posterior ones wider than the black postdisco-submarginal patches, interspace  $SC^4$ — $SC^5$  mostly filled up with black; of the postdisco-submarginal patches patch  $R^1$ — $R^2$  obviously smaller than patches  $SC^5$ — $R^1$  and  $R^2$ — $R^3$ , all the patches separated from edge of wing, but the middle ones often extending very close to it; middle of wing paler than basal area. —Hindwing: median bar  $C$ — $SC^2$  or bars  $C$ — $R^2$  black, bar  $R^2$ — $R^3$  seldom vestigial; submedian bar  $C$ — $SC^2$  black or brown, at least vestigial; postdisco-submarginal patch  $C$ — $SC^2$  not, or not much, smaller than the following patch, the

other patches very variable in size, often touching one another, sometimes well separated, pointed distally, the submarginal portions black, the postdiscal portions brown, sometimes obsolete, centre-parts brown; white submarginal spots in most specimens conspicuous, especially the upper two, spot C—SC<sup>2</sup> never absent, large.

*Underside* tawny cinnamon rufous or ochraceous, the glossy parts with purplish reflections, the discal interspaces of the same tint as the postdiscal ones, but more or less glossy, not paler.—Forewing: discal lunules more proximal than in the allied *aristogiton* and *marmax*, the discal interspaces often narrower than the darker median ones; discal bars black, at least the posterior ones; median interspace M<sup>1</sup>—M<sup>2</sup> nearly as wide as median interspace M<sup>1</sup>—SM<sup>2</sup>, or about one-third narrower.—Hindwing: glossy all over, except postdiscal and submarginal interspaces, discal luniform bars black, placed as in *marmax*, lunule SC<sup>2</sup>—R<sup>1</sup> being more proximal than the one before it; submarginal white dots seldom minute or obsolete, the first never absent, the black submarginal dots C—R<sup>1</sup> seldom indicated; the glossy postdisco-submarginal band as broad as in *aristogiton*, the section C—SC<sup>2</sup> wider than in *marmax*; admarginal line thin; last discal lunule turning round, at anal angle, to join the admarginal line; upper tail 2 to 5 mm. long, second a short tooth.

♀. Resembling the ♀ of *aristogiton*.

*Upperside*: disc in the Palawan form very pale.—Forewing: postdiscal interspaces nearly as broad as in *marmax*, except upper ones, which are as in *aristogiton*; discal bars SC<sup>4</sup>—R<sup>1</sup> either fused with postdisco-submarginal patches, or isolated, and then bar SC<sup>4</sup>—SC<sup>5</sup> not more proximal than bar SC<sup>5</sup>—R<sup>1</sup>; postdisco-submarginal patch R<sup>1</sup>—R<sup>2</sup> considerably smaller than patch SC<sup>5</sup>—R<sup>1</sup>.—Hindwing as in *aristogiton*, upper two submarginal dots always large; central and postdiscal portions of postdisco-submarginal patches more or less obviously brown.

*Underside* either as in ♂, with the proximal parts of the discal interspaces, especially of the forewing, buffish, or much paler than ♂, except median interspaces, which are darker, the discal interspaces entirely buff-colour; upper two white submarginal spots of hindwing large; upper tail spatulate, about 8 mm. long, second a blunt but prominent tooth.

Length of forewing: ♂, 40—44 mm.

    "    "    "    ♀, 45—51 mm.

Penis and penis-funnel as in *aristogiton*.

*Hab.* Java, Sumatra, and Palawan; not yet known from Borneo, nor from the Malay Peninsula, where the species most likely occurs.

The forms united here under *harmodius* are evidently the insular representatives of the Indian *Ch. aristogiton*. We should not hesitate in treating *aristogiton* as a subspecies of *Ch. harmodius*, if it were quite beyond doubt that *Ch. marmax* (which name is older than *harmodius*) is specifically distinct from *aristogiton*.

For the present, we consider it more opportune to keep *harmodius* specifically apart, feeling the more justified in doing this as there are no intergradations between *aristogiton* and *harmodius* known. Such intergradations can be expected to occur in the Malay Peninsula, where as yet no representative has been obtained.

*Ch. harmodius* has generally been overlooked or misidentified by entomologists. Herr Fruhstorfer (*l.c.*), drawing attention to the species in a note entitled: "Ein arg verkannter Charaxes aus dem Malayischen Archipel," shortly criticises Standing, Semper, Nicéville, and Hagen; but unfortunately he makes himself a mistake in maintaining that the specimens from Java, Sumatra and Palawan are identical.

There is no difficulty whatever in distinguishing the three subspecies from these three islands.

**a. *Ch. harmodius harpagon*.**

*Charaxes marmax* Westw. var. *harpagon* Staudinger, *Iris* II. p. 85 (1890) (Palawan).

*Charaxes marmax* var. *harpagon*, Semper, *Tagf. Philipp.* p. 336. n. 520 (1892) (Palawan).

*Charaxes harmodius*, Butler (*non* Felder, 1867), *Journ. Linn. Soc. Lond.* XXV. p. 398. n. 142 (1896) (Palawan; "*harpagon* manuscript name" *ex errore*!!); Fruhst., *Ent. Nachr.* XXIV. p. 57 (1898) (Palawan).

*Haridra harpagon*, Moore, *Lep. Ind.* II. p. 247 (1896) (Palawan).

♂. *Wings, upperside*.—Forewing: median bars  $SC^5-R^2$  marked; discal luniform bar  $SC^5-R^1$  much thinner than the tawny postdiscal spot at its outside, bar  $SC^4-SC^5$  fused with the postdisco-submarginal patch, smaller than in the other subspecies, the black colour not extending so much proximad, tawny postdiscal spot  $SC^4-SC^5$  sometimes vestigial.—Hindwing: white submarginal dots  $C-R^1$  larger than in *h. martinus* and *h. harmodius*, central portion of the black patches in which these dots are situated more or less tawny; median bar  $SC^2-R^1$  present.

*Underside* ochraceous, with the median interspaces darker, bars faintly edged with white.—Forewing: white submarginal scaling forming two triangular patches at apex of wing; and thin dashes upon the folds between veins  $SC^5-SM^2$ .—Hindwing: postdiscal interspaces  $C-R^1$  very wide, discal and postdiscal bars  $SC^2-R^1$  5 to 6 mm. distant from one another, distance between bars  $R^3-M$  about 3 mm.; postdiscal bars indistinct, tawny, not black.

♀. *Wings above*: discal interspaces creamy or yellow-buff.—Forewing: discal band limited proximally by the median bars; median bars  $SC^5-R^2$  very much closer to cell than to discal lunules; discal lunule  $SC^4-SC^5$  just in front of lunule  $SC^5-R^1$ , not more proximal, sometimes very faint, tawny like the other lunules, not widened out basad, lunule  $SC^5-R^1$  thin, not being heavier than the other lunules.—Hindwing: median bars  $C-R^1$  heavy, bar  $R^1-R^2$  also present as a short oblique line: discal band outwardly limited by faint indications of discal lunules; upper tail strongly spatulate.

*Underside* much paler than in ♂, median interspaces brown, discal ones buff, outer region more or less ochraceous; postmedian bars of hindwing darker brown than in ♂.

Length of forewing; ♂, 40—42 mm.

" " " ♀, 51 mm.

*Hab.* Palawan, 4 ♂♂, 2 ♀♀ (Dr. Platen).

This form reminds one by the pale tint of the upper- and underside of *Ch. marmax*, of which Staudinger considered it to be a variety.

**b. *Ch. harmodius martinus* Rothsch., subsp. nov.**

*Charaxes marmax* Westw. var. *harpagon* Staudinger, *Iris* II. p. 85 (1890) (Sumatra; *non* Palawan).

*Charaxes (Haridra) aristogiton*, Nicéville & Martin (*non* Felder, 1867), *Journ. As. Soc. Beng.* LXIV. 2. p. 438. n. 264 (1895) (N.E. Sumatra); Nicév., *l.c.* LXVI. 2. p. 552. n. 8 (1897) (partim; Sumatra).

*Charaxes aristogiton*, Hagen, *Iris* IX. p. 187. n. 250 (1896) (Karo, N.E. Sum.).

*Charaxes harmodius*, Fruhstorfer, *Ent. Nachr.* XXIV. p. 57 (1898) (pt.; Sumatra).

♂. *Wings, upperside*.—Forewing: median bars  $SC^5-R^2$  both strongly marked; discal bar  $SC^5-R^1$  thinner than the tawny postdiscal spot at its distal side.—Hindwing: median bar  $SC^2-R^1$  black like bar  $C-SC^2$ , bar  $R^1-R^2$  vestigial.



*Underside*: tawny cinnamon rufous, sometimes approaching in tint the preceding subspecies; bars conspicuously edged with white; white submarginal scaling prominent on forewing; postdiscal interspaces of the hindwing (outside the discal lunules nearly as broad as in *harpagon*, discal and postdiscal bars  $SC^2-R^1$  being about 5 mm. distant from each other, interspaces  $R^3-SM^2$  gradually becoming thinner, interspace  $R^3-M^1$  about three times as wide as interspace  $M^2-SM^2$ ; postdiscal bars black, heavy, standing in an almost straight line, upper ones more obviously luniform than the others.

♀. Unknown; most likely similar to ♂, with the discal interspaces of *underside* paler and the tail longer.

Length of forewing: ♂, 40—42 mm.

*Hab.* Sumatra. In the Tring Museum, 4 ♂♂ from the Bettak Mountains, February, March, April, May, June, July (Dr. Martin); Gayoe Mountains, January, May (Dr. Martin); Karo, January, September (Dr. Hagen).

Herr Frhstorfer maintained (*l.c.*) that the Sumatra examples of *harmodius* were absolutely identical with those from Java; in this he was wrong. We did not find it difficult to distinguish all the Sumatran individuals that we have seen from an equally long series of Java examples by the black discal bar  $SC^5-R^1$  of the forewing above being thinner than the tawny interstitial patch at its outer side.

Martin's collectors found this insect only at higher elevations from Bekantschan to the Central Plateau; it is not very common (*l.c.*).

### e. *Ch. harmodius harmodius*.

*Charaxes harmodius* Felder, *Reise Novara, Lep.* p. 445, n. 726 (1867) (Java); Butl., *Trans. Ent. Soc. Lond.* p. 121, n. 17 (1872); Fruhst., *Sitz.-Ber. Berl. Ent. Zeitschr.* p. 12 (1895) (Java); id., *Ent. Nachr.* XXIII. p. 236 (1897) (Java; descr. of ♀!); id., *Berl. Ent. Zeitschr.* XLI. p. 301 (1897) (Java); id., *Ent. Nachr.* XXIV. p. 57 (1898) (pt.; Java).

*Charaxes scyllax* Butler (non Felder, 1867), *Journ. Linn. Soc. Lond.* XXV. p. 397, n. 137 (1896) (Java).

♂. Resembles *h. martinus*, but differs as follows:

*Upperside*.—Forewing: median bar  $R^1-R^2$  faint, discal bar  $SC^5-R^1$  developed to a large black patch which is at least twice as wide as the tawny postdiscal spot at its distal side, discal bar  $SC^4-SC^5$  completely fused with postdisco-submarginal patch, the black colour more protruding proximad than in the other subspecies of *harmodius*, the interspace between median bar  $SC^5-R^1$  and black disco-submarginal markings about one-half or one-third as wide as the interspace between that bar and the cell, while in *h. martinus* the bar stands about midway between cell and disco-submarginal patches, and in *h. harpagon* somewhat closer to cell than to discal lunules.—Hindwing: median bar  $SC^2-R^1$  vestigial only, tawny or brown, not black.

*Underside* as in *h. martinus*, but postdiscal interspaces of hindwing narrower, the discal and postdiscal bars  $R^2-SM^2$  especially close together, upper postdiscal bars in most specimens straight or almost so, seldom luniform.

♀. Similar to ♂.

*Upperside*: discal interspaces of forewing more yellowish than basal area of wing, discal lunules  $R^1-M^1$  more blackish.—Hindwing: discal interspace  $C-SC^2$  whitish, interspace  $SC^2-R^1$  pale buff-yellow.

*Underside*: discal interspaces with buff patches at median bars; postdiscal black bars of hindwing heavier than in ♂; tail 7 mm. long, slightly spatulate.

Length of forewing : ♂, 40—44 mm.

♀, 45 mm.

*Hab. Java.* In the Tring Museum 9 ♂♂, 1 ♀ from: "Java"; Sukabumi, 2000 ft. (Fruhstorfer); Mount Gede, 4000 ft. (Prillwitz).

10. *Charaxes amycus*.

*Chvaraxes amycus* Felder, *Wien. Ent. Mon.* V. p. 303. n. 21, ♂ (1861) (Luzon); id., *Reise Novara*, *Lep.* p. 441. n. 719 (1867) (♂ Luzon; ♀ *spec. alt.*); Semp., *Taqf. Philipp.* p. 80. n. 101 (1887) (Luzon, Bohol, Camotes, Camiguin de Mindanao, Mindanao).

*Nymphalis polyxena* var. i. *C. amycus*, Kirby, *Cat. Diurn. Lep.* p. 272. sub n. 52 (1871) (pt.).

♂. *Wings above* richer tawny than in *marmax* and *aristogiton*, in the forms from Luzon and Mindoro somewhat shaded with olive.—Forewing: median bars  $SC^5-R^2$  mostly joined along veins to black outer area, which extends always to upper end of bar  $SC^5-R^1$  or farther basad; discal bars  $R^2-SM^2$  very variable, dark tawny or black, the last one sometimes obsolete, bars  $SC^5-R^2$  always developed to patches, sometimes tawny brown, not black; postdiscal tawny spots  $SC^5-SM^2$  always developed, the second and third sometimes very small, spot  $SC^4-SC^5$  seldom faintly vestigial; postdisco-marginal, purplish black, band extending to internal margin, the last partition often separated by the tawny vein  $SM^2$ , the other veins show some tawny scaling at ends, but there is never a tawny marginal line, not even at hinder angle.—Hindwing: postdisco-submarginal patches  $C-R^1$  nearly all fused together to a band, or patches  $R^1-SM^2$  isolated; white submarginal dot  $C-SC^2$  never quite absent, but often obscure, generally smaller than dot  $SC^2-R^1$  as in *Ch. marmax*; admarginal line mostly very prominent, better marked than in *marmax* and *aristogiton* at least between veins.

*Underside* different in tint in the three subspecies, resembling on the whole that of *aristogiton* and *harmodius harpagon*; discal interspaces of both wings glossy as in *aristogiton*.—Forewing: submedian and median bars  $R^3-SM^2$  on the whole more oblique than in the allies.—Hindwing: discal and postdiscal series of bars straighter than in *marmax*; agreeing in this respect with typical *aristogiton* and *harmodius*; median and submedian bars  $M^2-SM^2$  farther apart than in the allies; tails very variable in length, in Mindanao individuals sometimes reduced to short teeth.

♀. *Wings, upperside* either tawny olive or nearly orange ochraceous.—Forewing: discal bars  $R^3$ — $SM^2$  luniform, bar  $R^2$ — $R^3$  either also luniform or extended basad behind  $R^2$ , bars  $SC^4$ — $R^2$  developed to patches, which are black or tawny, and are joined to the black outer area along veins; median bars  $SC^5$ — $R^2$  (seldom absent) closer to those patches than to apex of cell; postdiscal interspaces orange ochraceous or cream-buff, all developed, but spot  $SC^4$ — $SC^5$  in the Mindoro form only vestigial; discal interspaces filled up by a creamy buff or orange ochraceous band, which anteriorly extends basad to bar D and median bar  $R^2$ — $R^3$ ; veins within black marginal area more or less orange tawny, sometimes with orange tawny scaling between veins, or veins quite black.—Hindwing: disc very faintly paler in front than behind, median bars C— $R^2$  absent (but showing through from below), or the upper one vestigial; white submarginal dots all present; postdisco-submarginal patches  $R^1$ — $SM^2$  becoming gradually smaller, patch  $SC^2$ — $R^1$  much larger, fused with patch C— $SC^2$ .

*Underside*: creamy buff or buff yellow, median as well as outer portions of

discal interspaces more or less brown, but interspace between median bars  $SC^5-R^2$  of forewing and cell of the same light colour as the discal interspaces.—Forewing: median bar  $R^3-M^1$  midway between most proximal point of discal bar  $R^3-M^1$  and base of  $M^1$  or closer to the latter.—Hindwing: discal uniform bars  $C-R^1$  evenly arched, not almost angle-shaped; discal interspaces  $C-R^1$  twice as wide as the respective median interspaces; two tails, upper one spatulate, 7 to 9 mm. long, second curved costad, 6 to 7 mm. long.

Length of forewing: ♂, 34—39 mm.

” ” ♀, 42—48 mm.

Penis with a lateral patch of teeth as in *marmax*; penis-funnel, however, as broad as in *aristogiton*.

*Hab.* Philippine Islands, apparently on all the islands of the group.

The race from Mindanao is so different, especially in the ♀, from those found on Mindoro and Luzon, that we should have treated it as specifically distinct, if we had not a male specimen from Mindanao which resembles the Mindoro individuals more than the extreme Mindanao examples. Besides, *carolus*, *amycus* and *georgius* are clearly geographical representatives of one another; we must, therefore, expect that intergradations also between the females will be found when more material from all the islands of the Philippine group has come to hand.

Drs. Staudinger and Butler made a mistake in identifying the Mindanao insect with the form described by Felder, which came from Luzon. This erroneous identification misled Dr. Staudinger to describe the Mindoro form, which is very slightly different from that inhabiting Luzon, as a distinct species. Dr. Butler, in his revision of the genus *Charaxes*, brings the Mindoro race *georgius* in the “*psaphon* group,” while the Mindanao race stands under the name of *amycus* in the “*marmax* group.”

*Ch. amycus* connects the allies of *Ch. marmax* with those of *Ch. polyxena*.

#### a. *Ch. amycus carolus* Rothsch., subsp. nov.

*Charaxes lunawara* Butler, *Lep. Erot.* p. 99. n. 6. t. 37. f. 2, ♀ (1872) (no loc., ♀; ♂ = *marmax*).  
*Charaxes amycus*, Semper (non Felder, 1867), *Taf. Philipp.* p. 80. n. 101 (1887) (Camiguin de Mind.; Mindanao; “Bohol,” “Camotes,” *haec subsp.?*); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 397. n. 138 (1896) (Davao, S.E. Mindanao).

♂. *Wings above* rich tawny orange.—Forewing: median bars  $R^2-M^2$  vestigial, the last often absent, or bars  $R^2-M^1$  black, but short and thin and not curved, median bars  $SC^5-R^2$  often tawny; discal bars  $R^2-SM^2$  thin, often tawny brown, sometimes not arched, the last one often very faint.—Hindwing: postdisco-submarginal patches  $R^1-R^3$  very much smaller than patches  $C-R^1$ , but in one example as in the following subspecies.

*Underside*: median bars  $R^2-M^1$  of both wings continuons, or  $R^2-R^3$  a little more proximal; postdiscal interspace  $SC^2-R^1$  of hindwing about as wide as respective discal interspaces; tails very variable in length, upper one 2 to 4 mm., second  $1\frac{1}{2}$  to  $3\frac{1}{2}$  mm.

♀. *Wings above* orange ochraceous, discal area of forewing somewhat paler.—Forewing: median bars feeble, often vestigial only, sometimes absent; discal bars often all tawny, postdiscal interspaces of the same colour as disc, spot  $SC^4-SC^5$  well marked; bar D sometimes vestigial only; veins within black postdisco-marginal area with orange ochraceous scaling.—Hindwing: postdisco-submarginal patches

R<sup>1</sup>—M<sup>2</sup> isolated, pointed distally, their submarginal parts black upon internervular folds ; white submarginal dots somewhat linear, but not half so long as the cellules are broad, except the upper two.

*Underside* : lighter parts buff-yellow, this colour often occupying the greater part of the wings.—Forewing : median bars R<sup>2</sup>—M<sup>1</sup> continuous, or nearly so ; median interspaces M<sup>1</sup>—SM<sup>2</sup> considerably narrower than the respective discal ones ; postdiscal, blackish, ill-defined, inconspicuous patches SC<sup>5</sup>—M<sup>2</sup> about one-third the way from the edge of the pale tawny orange marginal band to the discal lunules.—Hindwing : white submarginal dots C—R<sup>1</sup> larger than the others, all rather sharply defined ; postdiscal interspace SC<sup>2</sup>—R<sup>1</sup> very little smaller, or even larger, interspace C—SC<sup>2</sup> always larger, than the respective greyish postdisco-submarginal patches ; upper tail 8 to 9 mm. long, second 6½ to 7 mm.

Length of forewing : ♂, 36—39 mm.

" " " ♀, 44—48 mm.

*Hab.* Mindanao (*type*) and Camiguin de Mindanao. In the Tring Museum 3 ♂♂, 1 ♀ from Mindanao ; several ♀♀ from Mindanao in Dr. Standinger's collection.

The specimens from Bohol and Camotes recorded by Semper as *amycus* belong perhaps to this race, or may be intermediate between *carolus* and *amycus* ; we have not seen any examples from those islands. We have no doubt that the individuals from Camiguin de Mindanao are *carolus*.

#### b. *Ch. amycus georgius*.

*Charaxes georgius* Staudinger, *Iris* V. p. 262 (1892) (Mindoro) ; Semp., *Tafel. Philipp.* p. 335. n. 519 (1892) (pt. ; Mindoro) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 391. n. 121 (1896) (Mindoro).

♂. *Wings above* tawny orange, much shaded with olive brown.—Forewing : median bars SC<sup>5</sup>—M<sup>2</sup> strongly developed, the last of them seldom feeble, bar M<sup>1</sup>—(SM<sup>1</sup>) also developed as a rule, bars R<sup>3</sup>—M<sup>2</sup> luniform, bar R<sup>2</sup>—R<sup>3</sup> very much nearer cell than bar R<sup>3</sup>—M<sup>1</sup> ; discal bars R<sup>2</sup>—SM<sup>2</sup> rather thin, black or brown, very much thinner than the tawny orange spots at their distal side ; black border of wing posteriorly broader than in the preceding subspecies, being between M<sup>1</sup> and M<sup>2</sup> three times as wide as the respective postdiscal, tawny orange interspace ; veins more or less black from cell to black area, especially in front.—Hindwing : postdisco-submarginal patches almost gradually decreasing in size abdominad, the upper four fused together or touching each other, patches R<sup>1</sup>—M<sup>2</sup> pointed distally, sometimes produced to the admarginal line, which is conspicuous ; discal lunule C—SC<sup>2</sup> vestigial.

*Underside* : median bar R<sup>3</sup>—M<sup>1</sup> much more distal than bar R<sup>2</sup>—R<sup>3</sup> on both wings ; postdiscal interspaces C—R<sup>1</sup> of hindwing very much smaller than the respective discal ones ; tails of about equal length, upper one 5 to 5½ mm., second 4½ to 5 mm.

♀. *Wings above* tawny olive.—Forewing : less falcate than in *carolus*, discal band and postdiscal spots creamy buff ; median bars R<sup>2</sup>—M<sup>2</sup> heavy, black, bars R<sup>3</sup>—M<sup>2</sup> more or less strongly luniform, bars SC<sup>5</sup>—R<sup>2</sup> much thinner, sometimes obsolete ; discal bars R<sup>3</sup>—SM<sup>2</sup> thin, but sharply defined, black or brownish black, strongly arched, bar R<sup>2</sup>—R<sup>3</sup> also curved, but dilated basad behind R<sup>2</sup>, bars SC<sup>4</sup>—R<sup>2</sup> developed to one large black patch which is about as wide at R<sup>2</sup> as at SC<sup>5</sup>, fused with the black outer area ; postdiscal creamy buff spot SC<sup>4</sup>—SC<sup>5</sup> vestigial.—Hindwing : postdisco-submarginal patches larger than in *carolus*, close to the



admarginal, conspicuous line, the black scaling extending close to the discal lunule C—SC<sup>2</sup>, which shines through from below, submarginal parts of patches deep black, this colour forming regular lunules or angle-shaped markings, central parts greyish, postdiscal parts of patches R<sup>1</sup>—M<sup>2</sup> often obsolete ; white submarginal spots larger than in *carolus*, longer than half the width of the cellules.

*Underside* creamy buff, variegated in the usual way with olive-brown ; median bar R<sup>3</sup>—M<sup>1</sup> much more distal on both wings than bar R<sup>2</sup>—R<sup>3</sup> ; white submarginal scaling on fore- and hindwing more extended than in *carolus*.—Forewing : post-discal, brown, indistinctly defined patches R<sup>2</sup>—M<sup>2</sup> about midway between discal lunules and outer edge of white submarginal scaling, much more proximal than in *carolus*.—Hindwing : postdiscal interspace SC<sup>2</sup>—R<sup>1</sup> about half the size of the respective postdisco-submarginal glossy patch ; black submarginal dots much closer to admarginal line than in *carolus*.

Length of forewing : ♂, 34—39 mm.

” ” ” ♀, 42—43 mm.

*Hab.* Mindoro. In the Tring Museum 6 ♂♂, 3 ♀♀ from : “Mindoro” (Platen); Mt. Dulangan, 4 to 5000 ft., November 1895 to January 1896 (J. Whitehead) ; low lands, November 1895 to January 1896 (J. Whitehead).

### c. *Ch. amycus amycus*.

*Charaxes amycus* Felder, *Wien. Ent. Mon.* V. p. 303. n. 21, ♂ (1861) (Luzon) ; Butl., *Proc. Zool.*

*Soc. Lond.* p. 636. n. 55 (1865) (Philipp.) ; Feld., *Reise Novara, Lep.* p. 441. n. 719 (1867) (Luzon ♂ ; not ♀ = *baya*) ; Semp., *Tugf. Philipp.* p. 80. n. 101 (1887) (pt., Luzon).

*Charaxes antonius* Semper, *l.c.* sub n. 100 (1887) (Guimaras ♀, *haec subsp.* ?).

*Charaxes georgius*, Semper, *l.c.* p. 335. n. 519 (1892) (pt. ; Polillo, Guimaras, *haec subsp.* ?).

♂. Very close to *amycus georgius*, but the black colour of the *upperside* more extended.—Forewing : discal bars R<sup>2</sup>—M<sup>2</sup> heavy, wider than the tawny postdiscal spots, disc shaded at the base with brown ; black marginal area at least as wide behind as in *georgius*.—Hindwing : postdisco-submarginal patches less pointed distally than in *georgius*, the upper five (or nearly all) fused together ; disco-marginal area generally darker tawny than in the other two subspecies.

*Underside* on the whole somewhat darker than in *georgius*.

♀. Unknown.

*Hab.* Luzon. In the Tring Museum 4 ♂♂ from : “Luzon” (Lorquin, *type*) ; N. Luzon (J. Whitehead).

The specimen described as *amycus* ♀ by Felder was said to be from Celebes ; it bears on the pin one of Felder's labels on which is written : “Celebes, coll. v. d. Capellen, *type*.” The specimen does not belong to *amycus*, nor is it from Celebes, but is an individual of the Javan *Ch. polyxena baya*. The ♀ from Polillo is, according to Semper, the same as *georgius*, but we have some doubt that this is so ; a close comparison will most likely reveal similarly slight differences between the Polillo ♀♀ and those of *georgius* from Mindoro, as are found in the ♂♂ from Luzon (*amycus*) and Mindoro (*georgius*).

The Guimaras ♀ first recorded by Semper as a specimen of *antonius* is badly preserved ; it represents perhaps a race intermediate between *amycus* and *carolus*, judging from the geographical position of the locality.

- b°. ♂, postdiscal tawny interspace  $R^2-R^3$  of forewing smaller than the black patch at its proximal side, or absent; ♀, discal bar  $R^1-R^2$  of forewing above much heavier than posterior discal bars, about midway between outer margin and median bar  $R^1-R^2$ , or nearer the latter. *Polyxena* group.

The forms of *Charaxes* we are now going to deal with are more perplexing than any others. We can roughly divide them into two groups, according as the *males* have a white discal band on forewing, or not. On the islands of Palawan, Borneo and Sumatra, in the Malay Peninsula, and in China, there occur both a banded and a not-banded form without there being found any intergraduate specimens between the two. We must, therefore, conclude, for want of evidence showing the reverse to be true, that in those localities the two forms are perfectly independent of one another, or, in other words, belong to two distinct species. But if we examine the material from Burma and North India, we find no longer two well-separated forms, but meet with a great number of different-looking insects which entomologists have been at pains to describe as distinct species, but which are all connected with one another by intergradations. However, if we group the individuals again according to the presence or absence of a white discal band on the forewing of the *males*, we observe that the number of specimens which have the band more or less vestigial and connect the two groups of individuals completely is much smaller than the number of specimens of either group. We have vainly endeavoured to find characters in the sexual organs by which the forms could be constantly separated.

Have we then to deal with one, two or more "species" in North India and Burma? It might be suggested that the intergraduate specimens were hybrids. But that explanation is not admissible, (1) because the number of "hybrids" would be much too large, hybrids being rare, if not produced in confinement; (2) because the fact that no intergradates between the banded and not-banded forms of Sumatra and Borneo, whence large material has come to Europe, are known, speaks entirely against the Burmese and North Indian "species" hybridizing so freely. Hence we disregard this assumption of general interbreeding of "two species" altogether, and consider all the numerous forms known from Burma and N. India as specifically identical. Some authors have avoided the difficulty presented by the insects in question by picking out certain specimens as specifically distinct and including the intermediate examples arbitrarily into one or the other of those "species"; others preferred enumerating the insects as a dozen or more "species," but leaving it doubtful whether the "species" were all distinct. We agree with those who suggested, like Watson and Elwes, that the insects in question belonged all to one and the same very variable species. To clear up the matter entirely as regards the specific identity of the various Burmese and North Indian forms, it is necessary to rear the insects from the eggs of ♀♀ which have copulated with ♂♂ that are similar to them in colour. It would be a long step forward if one of the officers in Burma who takes an interest in Natural Science would try to obtain eggs from one ♀, rear the insects, and send the ♀, together with the offspring, carefully marked, to a public collection or to an expert.

There is one other point to be noted. The individuals which are intermediate between the banded and not-banded forms are mostly small specimens, being not only rarer, but on an average also decidedly less robust than the forms which approach the extremes in colour. Therefore, if it is true that we have to do only

with one variable, polychromatic, species, we may say that this species is in a process of being evolved into a dimorphic species by the elimination of the intermediate links. But it is surely futile to speculate any further on this subject, before we know precisely the life-history of the insects.

However, by uniting the various North Indian and Burmese examples to one species, we create another difficulty, respecting the Chinese and Malayan forms. For if we assume, as we are bound to do with our present incomplete knowledge, that forms like *klasianus* and *corax* are the same species, it would only be consistent to regard also the banded and not-banded specimens from Sumatra, Borneo, etc., as individuals of a dichromatic species. This, however, we cannot do, as regards the Malayan insects, because the banded Malayan forms are all well-defined, being, so far as we know, constantly different from the Indian banded individuals, while the not-banded extra-Indian individuals are in the *male* sex not always distinguishable from the Indian not-banded specimens. Therefore we think it justifiable to treat the Malayan banded forms as specifically distinct, whereas we must include the forms with not-banded ♂♂ in the same species to which the various banded and not-banded Indian forms belong. The Chinese banded and not-banded *males* we consider also to be specifically identical; it is true, there is no complete chain of intermediate specimens known, but the material in collections is so scanty and shows yet so much variability that the course we adopt is the best to follow at present.

The South Indian and Ceylonese *Ch. psaphon* is only a geographical offshoot of the species under discussion, but we treat it nevertheless as a distinct species, because it is apparently always well distinguishable in both sexes from all other forms. *Ch. psaphon* is, moreover, in so far of particular interest as the ♂ is not-banded, while the ♀ agrees to a certain extent better with the ♀♀ of the banded than with those of the not-banded forms, and might therefore be called a representative of the banded as well as of the not-banded Malayan species. It is, however, possible that a larger material from the North-West Himalayas and Nepal of the form called *hemana*, of which we have seen only a few individuals, will contain gradations from *hemana* to *psaphon*, in which case *psaphon* will sink as a subspecies of the variable Indo-Malayan *Ch. polyxena*.

## 11. *Charaxes polyxena*.

- ♀. *Papilio Eques Achivus polyxena* Cramer, *Pap. Exot.* I. p. 85. t. 54. f. A.B. (1775) (China; ♀, mutilated).  
 ♀. *Papilio Eques Achivus bernardus* Fabricius, *Ent. Syst.* III. 1. p. 72. n. 223 (1893) (China) (1775) (China, ♀).

♂. *Wings, upperside*.—Forewing: black outer area broad, at least in front, the black discal lunules merged together with it, but lunules  $M^1$ — $SM^2$  sometimes almost separate, occasionally obsolete; postdiscal tawny or white interspace  $M^2$ — $SM^2$  seldom filled up with black scaling, the other postdiscal interspaces often also more or less marked, but interspace  $R^2$ — $R^3$  always very much smaller than the discal portion  $R^2$ — $R^3$  of the black area at its proximal side, and situated halfway between median bar  $R^1$ — $R^2$  and outer margin of wing; discal interspaces varying from being bluish white to being concolorous with the basal area.—Hindwing less dentate than in *marmax* and allies, tooth  $M^2$  less prominent.

*Underside*: discal bars  $SC^4$ — $SC^5$  of forewing about a third the way between

median bars and outer margin of wing, being like the other median bars much more proximal than in *marmax* and allies.

♀. *Wings, upperside*.—Forewing: black discal bars  $R^3$ — $SM^2$  more or less thin, arched, joined at veins to the black postdisco-marginal band; postdiscal interspace  $R^1$ — $R^2$  a third the way between outer margin and median bar  $R^1$ — $R^2$ , more distal than spot  $R^2$ — $R^3$ , generally smaller than the black discal patch standing at its proximal side, but occasionally larger, buffish or white like the other postdiscal interstitial spots and the discal band, discal bars  $SC^3$ — $R^2$  very much heavier than bars  $R^3$ — $SM^2$ , mostly merged together with the black outer area except for postdiscal interstitial spots  $SC^4$ — $R^2$  or  $SC^5$ — $R^2$ .

*Underside*: discal bars  $SC^4$ — $R^2$  of forewing very much nearer the median bars than outer margin.

Length of forewing: ♂, 32—48 mm.

“ “ ♀, 43—58 mm.

The denticulation of the penis is individually variable; in the more robust specimens the teeth are generally heavier than in the smaller specimens and more numerous before the apex standing here mostly in two irregular rows.

*Hab.* From N.W. India to China, Palawan and Java.

The *Charaxes* figured by Cramer, *l.c.*, from China, is doubtless a *female* of this species with the tails broken off; and Fabricius's *bernardus* is also this species, as the description and Donovan's figure prove. Moore, in *Lep. Ind.* II. p. 246, refers the name of *bernardus* to a white-banded Chinese species, but in that he is surely wrong, as Fabricius describes the forewing as having a yellow band. The name of *bernardus* was published eighteen years after *polyxena*.

The *males* of all the forms of *Ch. polyxena* are very partial to decaying fruits, dung, and assemble often in great numbers on damp places of roads in and near the forest. The *females* do not share the habit, and are consequently much less often caught. The sap of trees is a great attraction for the ♂♂; they come also to sugar, which can be used as bait.

#### a. *Ch. polyxena bajula*.

♂ ♀. *Charaxes baya* Moore var. ? *bajula* Staudinger, *Iris* II. p. 86 (1889) (Palawan).

*Haridra bajula*, Moore *Lep. Ind.* II. p. 248 (1895) (Palawan).

*Charaxes corax* dwarfed form = *bayula*, Staud. in litt. (*sic*!) Butler, *Journ. Linn. Soc. Lond.* XXV. p. 391. sub n. 120 (1896) (Palawan).

♂. *Wings above*, basi-discal area rather brighter orange than in *repetitus* and *baya*, uniform in colour.—Forewing: median bars  $SC^{4.5}$ — $R^2$  absent or slightly vestigial, bars  $R^2$ — $M^2$  marked, or just traceable; black outer area only 9 to 11 mm. wide between  $R^1$  and  $R^2$ , somewhat produced basad behind  $R^2$  and before  $SC^6$ ; discal bar  $M^2$ — $SM^2$  vestigial, tawny, the tawny orange patch separated by it from the basi-discal area 2 mm. broad, bar  $M^1$ — $M^2$  tawny or black, in the latter case merged together with the black area, but there remains generally a small tawny orange spot at its distal side.—Hindwing: postdisco-submarginal patches  $C$ — $R^3$  contiguous, their postdiscal (proximal) portions developed, patches  $C$ — $R^1$  together convex proximally, their edge well defined, not produced proximad at veins, white dots in centre of patches  $R^1$ — $M^1$ , dots  $C$ — $R^1$  much larger than the others.

*Underside* apparently less variable, rather paler ferruginous tawny than in the allied forms; discal bars of both wings less arched, white borders of bars feeble.

♀. *Wings above*, basal area pale orange buff, paler than in the other subspecies



of *polyxena*.—Forewing: median bars  $R^2-M^1$  more or less marked, but bars  $SC^4-R^2$  not present, or very faintly indicated; disc pale buff yellow, paler in front than behind; discal bars,  $M^1-SM^2$  faintly indicated as orange buff lunules, the respective postdiscal interspaces therefore not clearly separated from the discal area, the same is the case with interspace  $R^1-R^2$ , the black area convex between  $M^2$  and  $SM^2$ , but incised at ( $SM^1$ ), also convex between the veins from  $R^2-M^2$ , more produced proximad between  $R^2$  and  $M^1$ , sinuate between  $R^1$  and  $R^2$ , here only 6–7 mm. broad; postdiscal interspace  $SC^5-R^1$  sometimes separated from the discal area.—Hindwing: discal area pale buff yellow in front; median bars  $C-R^2$  marked; postdisco-submarginal patches all with the proximal portions developed, hence the white dots within the patches, patch  $R^2-R^3$  a little larger than patch  $R^1-R^2$ , white dots large, especially upper two.

*Underside* as in the palest specimens of *repetitus*, median interspaces of forewing less brown, much shaded with buff; discal interspaces  $R^3-SM^2$  of forewing much broader than median ones; tail short, rounded at tip, not spatulate.

Length of forewing: ♂, 35–37 mm.

” ” ♀, 41 mm.

*Hab.* Palawan. In the Tring Museum 2 ♂♂, 1 ♀.

#### b. *Ch. polyxena fervens*.

♀. *Charaxes polyxena*, Weymer (non Cramer, 1775), *Stett. Ent. Zeit.* p. 269 (1885) (Nias).

♂. *Charaxes psaphon*, id. (non Westwood, 1848), *l.c.* (Nias).

♂. *Charaxes fervens* Butler, *Journ. Linn. Soc. Lond.* XXV. p. 396. n. 134 (1896) (Nias).

♀. *Charaxes fervens*, Lathy, *Entom.* XXI. p. 228 (1898) (Nias).

♂. *Wings above* as in bright specimens of *repetitus*.—Forewing: median bars not marked; black outer area variable in width in front, always very narrow behind, measuring about 5 mm. behind  $M^2$ , and 18 to 21 mm. at  $R^1$ , sometimes interrupted at ( $SM^1$ ), in which case the tawny admarginal patch  $M^2-SM^2$  is connected with the basi-postdiscal area; discal bar  $M^2-SM^2$  absent, or indicated as a faint tawny lunule, bar  $M^1-M^2$  black in upper half, bar  $R^3-M^1$  also black, mostly completely merged together with the black area; tawny postdiscal interstitial spot  $R^1-R^2$  sometimes present.—Hindwing: proximal portions of postdisco-submarginal patches  $R^1-SM^2$  absent, hence white dots at proximal side of the remaining submarginal portions of the black patches, size of these patches variable, but patch  $R^1-R^3$  smaller than the following two or three.

*Underside* bright ferruginous tawny, discal interspaces paler proximally, bars very prominent, especially on account of their conspicuous white borders, discal bars regularly arched, on the whole more deeply concave than in the other forms of *polyxena*.—Forewing: position of bars as variable as in *repetitus* and other subspecies of *polyxena*, but median bars  $R^2-SM^2$  rather more often continuous; white submarginal scaling prominent, distally generally limited by black scaling.—Hindwing: admarginal interspaces ochraceous, submarginal black, blue, white spots prominent; tail 4–7 mm. long.

♀. Resembling certain ♀♀ of *repetitus*. *Wings above*, discal area white, with a yellow tint, more distinctly yellow buff at internal margin of forewing, on hindwing the pale colour gradually merging between  $R^2$  and  $M^1$  into the tawny colour of the basi-discal area.—Forewing: median bars  $SC^{4.5}-M^2$  marked; discal bars  $R^3-M^2$  very thin, deeply arched, the postdiscal interspace  $M^1-M^2$  nearly

as broad in middle as the black outer area, discal bar  $M^2$ — $SM^2$  faintly vestigial, bar  $R^2$ — $R^3$  rather heavier, the postdiscal spot at its distal side small, two more postdiscal spots in black area between  $SC^5$  and  $R^2$ .—Hindwing : postdiscal portions of postdisco-submarginal patches tawny olive, not black, the patches larger than in *repetitus* except patches  $C$ — $R^1$  ; white submarginal dots long.

*Underside*, discal, great part of postdiscal, a portion of the submedian interspaces of both wings and the admarginal interspaces of the hindwing more or less maize yellow ; discal bars deeply arched ; tawny ochraceous marginal band of forewing about 5 mm. broad at  $R^1$ , here wider than in *repetitus* ; tawny russet postdiscal half-moons of hindwing with few black scales at outer side ; tawny admarginal line of hindwing very prominent ; tail  $R^3$  slightly widened before end, rounded at tip, tail  $M^2$  indicated by a sharp tooth.

Length of forewing : ♂, 43—46 mm.

” ” ♀, 57 mm.

*Hab.* Nias. In the Tring Museum, 6 ♂♂, 1 ♀.

This large form of *polyxena* is fairly constant ; the conspicuously marked underside distinguishes it from all other forms of *polyxena*. *Ch. polyxena fervens* does not seem to be rare, as we have seen several dozens of it.

### c. *Ch. polyxena baya*.

*Nymphalis baya* Moore, in Horsf. & Moore, *Cat. Lep. Ins. Mus. E.I.C.I.* p. 207. n. 424 (1857) (Java ; not “ N. India,” nor larva and chrysalis) ; Pagenst., *Jahrb. Nass. Ver. Nat.* XLIII. p. 97. n. 64 (1890) (E. Java).

*Charaxes baya*, Butler, *Proc. Zool. Soc. Lond.* p. 636. n. 53. t. 37. f. 5, ♂ (1865) (Java ; not “ Borneo ” and “ India ”) ; Druce, *ibid.* p. 346 (1873) (Java) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 391. n. 119 (1896) (pt. ; Java).

♀. *Charaxes amycus* Felder, *Reise Novara, Lep.* p. 441. n. 719 (1867) (pt. ; ♀, “ Celebes ” *loc. err.*). *Charaxes scyllar* Felder, *Reise Novara, Lep.* p. 442. n. 720 (1867) (Java) ; Butl., *Tr. Ent. Soc. Lond.* p. 120. n. 11 (1870) (= *baya*).

*Nymphalis polyxena* var. h. *C. baya*, Kirby, *Cat. Diurn. Lep.* p. 272. sub n. 52 (1871) (pt. ; Java).

*Nymphalis polyxena* var. j. *C. scyllar*, id., *l.c.* (Java).

*Nymphalis polyxena*, Pagenstecher, *l.c.* n. 65 (1890) (E. Java, July).

*Charaxes polixeni*, Snellen, *Tijdschr. v. Ent.* XXXIII. p. 290. n. 26 (1890) (pt. ; Java).

*Haridra scyllar*, Moore, *Lep. Ind.* II. p. 247 (1895) (Java).

*Haridra baya*, id., *l.c.* p. 248 (1895) (Java).

*Charaxes baja* (!), Fruhstorfer, *Berl. Ent. Zeitschr.* XLI. p. 302 (1896) (Java ; = *scyllar* ! *loco scyllar*).

♂. *Wings above*.—Forewing : black outer area broader between  $M^2$  and internal margin and narrower between  $R^3$  and  $M^2$  than in *repetitus*, black discal luniform spots  $R^3$ — $SM^2$  close to the black band, of the tawny postdiscal interspaces only the last one to four developed, but spots  $R^1$ — $R^3$  sometimes vestigial ; median bars  $SC^{4,5}$ — $R^2$  seldom absent, seldom entirely merged together with the black area, as a rule separated from the latter by a double tawny patch, but joined posteriorly to it behind  $R^2$ , where the black area is dilated basad ; disc between cell and black outer area near costal margin sometimes rather pale.—Hindwing : postdisco-submarginal patches gradually smaller behind, the postdiscal portions of patches  $R^2$ — $M^2$  not absent, though not so large as the submarginal portions, the white dots consequently within the black patches, that of patch  $R^1$ — $R^2$  nearer the outer than the inner edge of the patch ; black scaling more or less extending basad along  $SC^2$ .

*Underside* variable as in the allied forms ; median interspaces  $R^3$ — $SM^2$  of the forewing on the whole wider than the discal ones, while in *repetitus* the reverse is generally the case ; second tail well indicated, rather longer than in *repetitus*, those

Sumatran specimens of that subspecies excepted which are specially mentioned under *d*.

♀. *Wings above* olive tawny, variable in the depth of the olive tint.—Forewing: median bars  $SC^{4.6}$ — $R^2$  and upper part of bar D merged together to a rather large triangular patch, to which is joined the median bar  $R^2$ — $R^3$ ; discal band varying from creamy white to pale buffish yellow, ochraceous beyond  $SM^2$ ; discal bars  $R^3$ — $SM^2$  rather thin, dark tawny olive, not black; postdiscal interspaces  $SC^5$ — $SM^2$  all marked as a rule, but interspaces  $SC^5$ — $R^1$  and  $R^2$ — $R^3$  sometimes absent.—Hindwing: postdisco-submarginal patches closer to outer margin than in *polyxena repetitus*, their proximal portions at least vestigial, that of patch  $R^1$ — $R^2$  well marked, hence this patch especially larger than in *repetitus*.

*Underside* similar to *repetitus*, but the brown median band of forewing anteriorly limited by cell-bar 4 and median bars  $SC^3$ — $R^2$ , while in *repetitus* the interspace between median bars  $SC^3$ — $R^2$  and bar D is buff colour; hindwing with two tails, the first strongly dilated at end, 8 mm. long, the second curved costad, obliquely and obtusely cut off, 6 to 7 mm. long.

Length of forewing: ♂, 36—41 mm.

♀, 43—45 mm.

*Hab.* Java. In the Tring Museum 18 ♂♂, 5 ♀♀ from: "Java" (type of *scylax*); S. Java, 1500 ft. (H. Fruhstorfer); Mt. Gede, 4000 ft. (Prillwitz); Sukabumi, 2000 ft. (H. Fruhstorfer).

The ♀ described by Felder as that sex of *amycus* and said to be from Celebes agrees with the ♀♀ of *baya*, and is certainly a Java specimen.

#### *d. Ch. polyxena repetitus.*

♀. *Charaxes borneensis*, Butler, *Lep. Exot.* p. 16. n. 7. ♀ (1869) (Borneo, ♀, non ♂).

*Charaxes harpax*, Distant (non Felder, 1867), *Rhop. Mal.* p. 109. n. 8. t. 13. f. 1 ♂ (1883) (Prov. Wellesley, Mal. Pen.); Nicéville, *Bull. of Ind.* II. p. 288. n. 581 (1886) (pt.; Prov. Wellesley; Borneo); Hagen, *Iris*, IX. p. 187. n. 249 (1896) (N.E. Sum.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 390. n. 118 (1896) (pt.; Borneo; Sumatra); Bartl., *Note Book of Sarawak* II. p. 68. n. 125 (1896).

*Charaxes polyxena*, Snellen (non Cramer, 1775), *Tijdschr. v. Ent.* XXXIII. p. 290. n. 26 (1890) (Billiton).

*Charaxes polyxena*, id., in Snelleman, *Midd. Sumatra* II. p. 16 (1892).

*Charaxes (Haridra) harpax*, Nicéville and Martin, *Journ. As. Soc. Beng.* LXIV. 2. p. 437. n. 263 (1895) (N.E. Sumatra).

*Haridra harpax*, Moore, *Lep. Ind.* II. p. 237. t. 174. f. 1b. 1c. ♀ (1895) (pt.; Mal. Pen.; Sumatra; Borneo).

*Charaxes baya*, Butler (non Moore, 1857), *Journ. Linn. Soc. Lond.* XXV. p. 391. n. 119 (1896) (Sarawak; non Java); Bartl., *l.c.* n. 126 (1896).

*Charaxes repetitus* Butler, *l.c.* p. 392. n. 123 (1896) (Sarawak, ♂).

*Charaxes ajax* Fawcett, *Ann. Mag. N.H.* (6) XX. p. 112 (1897) (Batak Mts., Sumatra, June, July).

♂. We cannot find any constant character by which to distinguish all the *males* from the Malay Peninsula, Sumatra, the Natuna Islands, and Borneo from the continental *Ch. polyxena hierax* ♂-*f. corax*. Major Fawcett described individuals from the Batak Mountains, Sumatra, as a new species, *Ch. ajax*; we have compared a number of specimens from that locality, but failed to see that the greater percentage of them were any more different from the examples from the lowlands of Sumatra or from Borneo than the specimens from either of these latter

localities are *inter se*, though some individuals have a slightly different aspect on account of the larger postdisco-submarginal patches of the hindwing. Dr. Butler's *repetitus* from Borneo is based upon an individual in which the discal and median interspaces of the forewing above are whitish buff in the costal region; transitions from the ordinary Bornean examples to this form, which agrees with certain examples of *Ch. polyxena hierax* ♂-f. *jalinder*, are not rare, but examples with the discal band so clearly indicated as in the *type* specimen of *repetitus* are rare, there being only one in the Tring Museum among the hundred ♂♂ selected from large quantities. This specimen came from Bakan, N. Borneo, and was collected (like the *type*!) by the late Mr. A. Everett, in July 1891. On the whole the ♂♂ of *repetitus* have the black admarginal lunules of the hindwing *above* better marked than the individuals of the continental ♂-f. *corax*, and the submedian and median bars of the *underside* are nearly always conspicuously edged with white.—*Upperside*: black area of forewing variable in width, often reaching cell along SC<sup>4,5</sup>, postdiscal, interstitial, tawny spots variable in number, discal bars M<sup>1</sup>—SM<sup>2</sup> often absent, sometimes completely merged together with the postdisco-marginal band: postdisco-submarginal patches of hindwing either as in ♂-f. *corax*, the postdiscal portions of patches R<sup>1</sup>—SM<sup>2</sup> absent or obsolete, or as in ♂-f. *hierax*, the white dots standing in the centre of the rather large and continuous, or subcontinuous, patches, with all intergradations from the same places; in a few examples some of the postdisco-submarginal spots join the black admarginal lunules. The *underside* varies much in the general tint; russet specimens are the commonest, but there are also olive buff and bright cinnamon rufous ones.

♀. *Upperside*: basal area varying from bright tawny ochraceous to tawny cinnamon; band of forewing pale ochreous buff, postdiscal interstices R<sup>1</sup>—SM<sup>2</sup> the same colour, discal bars M<sup>1</sup>—SM<sup>2</sup> often feebly marked, median bars SC<sup>4,5</sup>—M<sup>2</sup> vestigial or even absent, bar R<sup>3</sup>—M<sup>1</sup>, however, sometimes heavier; or the discal band is white down to M<sup>2</sup> or (SM<sup>1</sup>), the postdiscal interstitial spots are smaller, partly absent, and the median bars R<sup>3</sup>—M<sup>2</sup> are heavier; white submarginal dots R<sup>1</sup>—SM<sup>2</sup> of hindwing always at proximal side of the black patches, the postdiscal portions of these patches being obsolete; Sumatran individuals occasionally with two tails like the ♀ of *Ch. polyxena baya* from Java.

*Hab.* Malay Peninsula, Sumatra, Banka, Billiton, Natuna Islands, Borneo. In the Tring Museum 100 ♂♂, 8 ♀♀.

In Sumatra the insect is found, according to Dr. Martin "from the sea (Paya Bakong) to Bekantschan. It occurs in every forest, where it is especially partial to faeces and moist spots. It is a very variable insect as regards the extent of the black colouration on the upperside of the forewing, and the colouring of both wings on the underside." Dr. Hagen calls it the most common of all the tawny species of *Charaxes*. In Borneo it must also be common, judging from the number of specimens that are found in collections sent from there. Amongst the specimens which Dr. Martin's collectors brought from the Battak Mountains are some in which the tawny postdiscal spots R<sup>1</sup>—SM<sup>2</sup> of the forewing above are all developed, the postdisco-submarginal patches rather longer than in ordinary individuals, and second tail, more obviously indicated; it is possible that these specimens together with the two-tailed ♀ recorded by Dr. Martin belong to a mountain race, the name of which would eventually be *ajax*.



e. *Ch. polyxena hierax*.

- Charaxes bernardus*, Doubleday, *List. Lep. Ins. Brit. Mus.* I. p. 112 (1844) (partim).  
*Nymphalis bernardus*, Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 35 (1850) (pt.; N. India); Horsf. & Moore, *Cat. Lep. Ins. Mus. E.I.C.* I. p. 206. n. 423 (1857) (pt.; Silhet; Darjiling).  
*Nymphalis baya*, Moore, in Horsf. & Moore, *Cat. Lep. Ins. Mus. E.I.C.* I. p. 207. n. 424. t. 12. f. 14. 14a. (1857) (pt.; N. India).  
*Charaxes baya*, Butler, *Proc. Zool. Soc. Lond.* p. 636. n. 53 (1865) (pt.; India); Nicév., *Butt. of Ind.* II. p. 286. n. 578 (1886) (pt.).  
*Charaxes bernardus*, Butler, *Proc. Zool. Soc. Lond.* p. 636. n. 54 (1865) (pt.; N. India); Wats., *Journ. Bombay N. H. Soc.* VI. p. 42. n. 96 (1891) (Chin Lushai); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 392. n. 125 (1896) (pt.).  
*Charaxes hierax* Felder, *Reise Novara, Lep.* p. 442. n. 721 (1867) (Assam); Butl., *Tr. Ent. Soc. Lond.* p. 120. n. 12 (1870) (= *bernardus*); Nicév., *Butt. of Ind.* II. p. 290. n. 583 (1886) (pt.); Elwes, *Tr. Ent. Soc. Lond.* p. 369. n. 215 (1888) (Sikkim); Wats., *Journ. Bombay N. H. Soc.* VI. p. 42. n. 95 (1891) (Pank to Tilin, Oct.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 390. n. 117 (1896) (Upp. Assam; Silhet; non "China").  
*Charaxes hipponax* Felder, *Lc.* p. 443. n. 722 (1867) (Assam); Butl., *Tr. Ent. Soc. Lond.* p. 120. n. 13 (1870) (= *bernardus*); Nicév., *Butt. of Ind.* II. p. 290. n. 584 (1886) (Cachar; Sylhet; Khasi Hills; Sikkim); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 393. n. 126 (1896); Wats., *Journ. Bombay N. H. Soc.* X. p. 636 (1896) (Manipur R., Tiddim, 2000 ft.).  
*Charaxes pleistoanax* Felder, *Lc.* p. 443. n. 723 (1867) (Assam); Butl., *Tr. Ent. Soc. Lond.* p. 121. n. 14 (1870) (= race of *bernardus*); Nicév., *Butt. of Ind.* II. p. 292. n. 587 (1886); Elwes, *Tr. Ent. Soc. Lond.* p. 369. n. 216 (1888) (Sikkim); Nicév., *Journ. Bombay N. H. Soc.* V. p. 297. n. 51 (1890) (Chin Lushai); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 394. n. 129 (1896) (Sikkim; Bhutan; Assam).  
*Charaxes corax* Felder, *Lc.* p. 444. n. 724 (1867) (Ind. sept.); Butl., *Tr. Ent. Soc. Lond.* p. 121. n. 15 (1870) (Silhet); Nicév., *Butt. of Ind.* II. p. 287. n. 580 (1886); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 391. n. 120 (1896) (pt.).  
*Charaxes harpa* Felder, *Lc.* p. 444. n. 725 (1867) (hab. ?); Moore, *Proc. Zool. Soc. Lond.* p. 832 (1878) (Moulmein to Meetan; Moolai, 3-6000 ft.); Nicév., *Butt. of Ind.* II. p. 288. n. 581 (1886) (pt.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 390. n. 118 (1896) (pt.; Silhet; E. Pegu); Wats., *Journ. Bombay N. H. Soc.* VI. p. 42. n. 94 (1891) (Chin Lushai, iii. v. x. xi).  
*Nymphalis polyxena*, Kirby, *Cat. Diurn. Lep.* p. 272. n. 52 (1871) (pt.).  
*Nymphalis polyxena* var. a. *Char. pleistoanax*, Kirby, *Lc.* p. 272. sub. n. 52 (1871) (Assam).  
*Nymphalis polyxena* var. c. *C. hierax*, Kirby, *Lc.* (1871) (Assam).  
*Nymphalis polyxena* var. e. *C. hipponax*, Kirby, *Lc.* (1871) (Assam).  
*Nymphalis polyxena* var. h. *C. baya*, Kirby, *Lc.* (1871) (pt.; India).  
*Nymphalis polyxena* var. l. *C. corax*, Kirby, *Lc.* p. 273 (1871) (Ind. bor.).  
*Charaxes khimalara* Butler, *Lep. Exot.* p. 97. n. 2. t. 37. f. 1 (1872) ("N. W. Himalayas" *err. loc.*; Nepal); Nicév., *Butt. of Ind.* II. p. 292. no. 588 (1886).  
*Charaxes khasianus* Butler, *Lep. Exot.* p. 98. n. 3. t. 37. f. 6 (1872) (Khasia Hills; N. E. Bengal); Nicév., *Butt. of Ind.* II. p. 293. n. 589 (1886) (Jorehât; Sikkim).  
*Charaxes jalinder* Butler, *Lep. Exot.* p. 98. n. 4. t. 37. f. 4 (1872) (N. E. Himalayas); Nicév., *Butt. of Ind.* II. p. 291. n. 585 (1886).  
*Charaxes hindia* Butler, *Lep. Exot.* p. 99. n. 6. t. 37. f. 5 (1872) (Darjiling, ♂, not ♀; ♀ = *innua*, *loc. err.*); Nicév., *Butt. of Ind.* II. p. 291. o. 586 (1886).  
*Charaxes agna* Moore, *Proc. Zool. Soc. Lond.* p. 832 (1878) (Moolai, Upp. Tenass., 3-6000 ft.); Nicév., *Butt. of Ind.* II. p. 289. n. 582 (1886).  
*Charaxes watti* Butler, *Proc. Zool. Soc. Lond.* p. 148. n. 6. t. 15. f. 2 (1880) (Bishnath, Assam); Nicév., *Butt. of Ind.* II. p. 287. n. 579 (1886); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 390. n. 118 (1896) (pt.).  
*Nymphalis polyxena*, Nicéville, *Journ. As. Soc. Beng.* L. 2. p. 58. n. 100 (1881) (Sikkim).  
*Haridra polyxena*, Nicéville, *Journ. As. Soc. Beng.* 1. 2. p. 61 (1882) (Sikkim).  
*Haridra agna*, Butler, *Ann. Mag. N. H.* (5). XVI. p. 306. n. 49 (1885) (Manipur).  
*Haridra hindia*, Butler, *Ann. Mag. N. H.* (5). XVI. p. 306. n. 50 (1885) (Maoipur); Swinh., *Tr. Ent. Soc. Lond.* p. 290. n. 203 (1893) (Khasia Hills).  
*Charaxes (Haridra) corax*, Wood-Mas. & Nicév., *Journ. As. Soc. Beng.* LV. 2. p. 363. n. 104 (1886) (Cachar, June—August); Elwes & Nicév., *ibid.*, p. 427. n. 85 (1886) (Tavoy).

- Haridra khimulara* Butler, *Ann. Mag. N. H.* (5). XVI. p. 306. n. 51 (1885) (near Assam); Swinh., *Tr. Ent. Soc. Lond.* p. 290. n. 202 (1893) (Khasia Hills).
- Haridra borneensis*, Moore (*non* Butler, 1869), *Journ. Linn. Soc. Lond.* XXI. p. 38 (1886) (Mergui, Elphinstone).
- Charaxes (Haridra) jalinulr*, Wood-Mas. & Nicéy., *l.c.* LV. p. 363. n. 105 (1886) (Cachar : Dhurmthal, Nemotha); Nicéy., in Risley, *Gazetteer of Sikkim* p. 148. n. 239 (1894) (Sikkim).
- Charaxes (Haridra) hindia*, Wood-Mas. & Nicéy., *l.c.* LV. p. 364. n. 106 (1886) (Cachar, Silenri, June to August); Nicéy., in Risley, *Gazetteer of Sikkim* p. 148. n. 240 (1894).
- Charaxes (Haridra) agna*, Elwes & Nicéy., *Journ. As. Soc. Beng.* LV. 2. p. 427, n. 84 (1886) (Tavoy).
- Nymphalis hindia*, Robbe, *Ann. Soc. Ent. Belg.* XXXVII. p. 130. n. 54 (1892) (Darjiling, Kurseong).
- Haridra corax*, Swinhoe, *Tr. Ent. Soc. Lond.* p. 289. n. 197 (1893) (Khasia Hills); Moore, *Lep. Ind.* II. p. 238. t. 175. f. 1. 1a. 1b. ♂, l., p. (1896) (Sikkim; Bhotan; Assam; Khasia Hills; Burma).
- Haridra khasiana*, Swinhoe, *l.c.* p. 290. n. 198 (1893) (Khasia Hills); Moore, *l.c.* p. 245. t. 182. f. 1. 1a. ♂. ♀ (1896) (Khasia Hills; Burma).
- Haridra hierax*, Swinhoe, *l.c.* n. 199 (1893) (Khasia Hills); Moore, *l.c.* p. 239. t. 176. f. 1. 1a. b. ♂. ♀ (1896) (Assam).
- Haridra hipponax*, Swinhoe, *l.c.* n. 200 (1893) (Khasia Hills); Moore, *l.c.* p. 242. t. 198. f. 1. 1a. ♀. ♂ (1896) (Sylhet; Khasia Hills; Naga Hills).
- Haridra pleistoanax*, Swinhoe, *l.c.* n. 204 (1893) (Khasia Hills); Moore, *l.c.* p. 244. t. 181. f. 1. 1a. b. c. ♂. ♀ (1886) (Sikkim; Bhotan; Naga Hills).
- Haridra jalinulr*, Swinhoe, *l.c.* n. 204 (1893) (Khasia Hills); Moore, *l.c.* p. 243. t. 179. f. 1. 1a. b. c. ♂. ♀ (1896) (Khasia and Naga Hills; Upp. Burma).
- Charaxes (Haridra) hierax*, Nicéville, in Risley, *Gazetteer of Sikkim* p. 148. n. 237. (1894) (Sikkim, rare, low elev.).
- Charaxes (Haridra) hipponax*, Nicéville, *l.c.* n. 238 (1894) (Sikkim); Wats., *Journ. Bombay N. H. Soc.* X. p. 657. n. 122 (1896) (Manipur R., = *hindia* = *jalinulr*).
- Haridra harpax*, Moore, *Lep. Ind.* II. p. 237. t. 174. f. 1. 1a. (1896) (pt.).

The various differently coloured forms united here under *hierax* are neither local nor seasonal. In many places all the forms occur together at the same time of the year, but one form may be much rarer than the other. The intergradations also occur together with the more extreme varieties. Judging from the dated specimens, it appears that individuals from pupae that have hibernated are small, and have the band of the forewing never all white.

The males can conveniently be divided into some main groups of individuals, each main group again being arbitrarily divisible into a number of groups, as the individuals vary so much that scarcely any two are found alike, if one compares the upper- and undersides. Although it is convenient for the student of variation to have names for the individual varieties, we think it would not be wise to introduce new names for those forms of the present subspecies which have escaped being baptized by Felder, Butler, or Moore. We arrange, therefore, the following exposition in such a manner that the ten names given by those authors to individuals of *Ch. polyxena hierax* are a sufficient supply. It is needless to say that the groups of specimens are not sharply defined.

♂. I. White band of forewing extending to internal margin. Basal area of wings, *above*, blackish tawny olive to tawny, mostly with white scaling at proximal side of median bars; specimens without postdiscal interstitial spots on forewing are ♂-f. *pleistoanax* (= *khimulara*), specimens with such spots are ♂-f. *khasianus*.

II. White band of forewing stopping at SM<sup>2</sup>, or absent, with intergradations.

1a. White submarginal dots of hindwing in centre of postdisco-submarginal patches R<sup>1</sup>—SM<sup>2</sup>, or nearer their outer edge.

- 2a. Black disco-marginal area of forewing very wide in costal region, the tawny or white median and discal interstices  $SC^{4.5}-R^2$  small, often filled up with black; discal band of forewing varying from being white to being only a little paler than the basal area; median bars  $R^3-(SM^1)$  of forewing well-marked also in the tawny specimens: ♂-f. *hipponax*.
- 2b. Discal and median interspaces  $SC^{4.5}-R^2$  of forewing *above* well developed.
- 3a. Band of forewing varying from white to pale yellow. Specimens with the black median bars  $SC^{4.5}-M^2$  of forewing *above* absent are Bntler's *hindia*: ♂-f. *jalinder*.
- 3b. Discal interspaces of forewing *above* scarcely paler than basal area, sometimes slightly buffish or whitish in costal regions, with or without obvious black median bars. ♂-f. *hierax* (= *watti*).
- 1b. White submarginal dots \* of hindwing standing at the proximal edges of the black postdisco-submarginal patches  $R^2-SM^2$ , the post-discal portions of these patches being obsolete, the patches small and, generally well separated from each other; patches  $C-R^1$  large and merged together, seldom also small; ♂-f. *corax* (= *agna* = *harpax*).

♀. In this sex the band of forewing is always more or less white, seldom all yellowish white. If we divide here the ♀♀ into several groups we must expressly state that we do not mean to say that the *females* and *males* called by the same aberrational name do not mate with the individuals called by other names; a *pleistoanax* ♀ is not only a ♀ of the ♂-f. *pleistonax*, but also of ♂-f. *jalinder*, ♂-f. *hierax*, etc. Though it is known from some mammals, especially domesticated ones, that they prefer associating (and copulating) with similarly coloured individuals, such an association rendering the single individual less conspicuous, and hence more protected, it is scarcely admissible to assume that the individuals of the present variable insect gave preference in mating to those colours that came nearest their own. The names of aberrations have not the same biological meaning as specific and subspecific names, but express simply the fact that the individuals so named have certain characters in common.

I. Discal band of forewing white, reaching internal margin; white scaling extending basad at least to point of origin of  $M^2$  (♀-f. *khasianus*), not extending so far down (♀-f. *pleistoanax*).

## II. Band stopping at $SM^2$ .

1a. White submarginal dots of hindwing in centre of black postdisco-submarginal patches, or nearer their outer edges.

2a. White discal interstices  $SC^4-R^2$  of forewing smaller than the respective median ones: ♀-f. *hipponax*.

2b. . . larger than the median ones, the black median bars nearer the inner than the outer edge of the band: ♀-f. *hierax*. The specimens do not exhibit characters which would justify a separation into two forms as in the case of the ♂♂ (♂-f. *hierax*, ♂-f. *jalinder*).

\* If the dots are absent their position can be ascertained by holding the specimen against the light; the dots of the underside will then show through.

16. White submarginal dots of the hindwing at the proximal edge of the black postdisco-submarginal patches  $R^1$ — $SM^2$ , the proximal parts of these patches being obsolete : ♀-f. *corax*.

*Hab.* Sikkim to Tenasserim, more or less common ; the ♂♂ without bands rare in Sikkim, occurring there only at low elevations, the aberrations named *jalinder* and *hindia* apparently the commonest of all.

The number of teeth on the penis varies much individually ; the subapical teeth are not so strong as in *psaphon* ; in many specimens there is a lateral patch of minute teeth as in *Ch. marmax*, but this character is not only extremely variable individually, but occurs independently of the characters of the wing which distinguish the various forms enumerated above.

### f. *Ch. polyxena hemana*.

*Charaxes bernardus*, Kollar (non Fabricius, 1793), in Hügel, Kaschmir IV. 2. p. 434. t. 11 f. 1. 2. ♂ (1844) (Massuri).

*Charaxes hemana* Butler, *Tr. Ent. Soc. Lond.* p. 122. t. 4. f. 1 ♂ (1870) (Nepal) ; Nicéev., *Butt. of India* II. p. 283. n. 575 (1886) (Nepal ; Kumaon) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 391. n. 122 (1896) (Mussuri ; north of Landoor ; "North India"!).

*Nymphalis polyxena* var. g. *Ch. hemana*, Kirby, *Cat. Diurn. Lep.* p. 273. sub n. 52 (1871) (Nepal).

*Charaxes (Haridra) hemana*, Doherty, *Journ. As. Soc. Beng.* 1887. II. p. 124. n. 97 (1886) (Kumaon) ; Mackin. & Nicéev., *Journ. Bombay N. H. Soc.* XI. p. 377. n. 124 (1897) (Mussoorie, Sept., 4000 ft.).

*Haridra hemana*, Moore, *Lep. Ind.* II. p. 240. t. 177. f. 1. 1a. 1b. ♂, ♀ (1896) (N.W. Himalayas ; Nepal).

♂. Similar to *Ch. psaphon imna*, but forewing *above* with two or more post-discal interstitial lunules and with tawny ochraceous outer margin ; postdisco-submarginal patches of hindwing without white dots, except last two ; apex of forewing more acute than in the not-banded ♂♂ from N.E. India and Burma, outer margin less deeply concave, and anal angle of hindwing more rounded.

♀. *Wings above* pale tawny ochraceous, approaching buff yellow.—Forewing : median black bars  $SC^5$ — $SM^2$  all present, or bar ( $SM^1$ )— $SM^2$  absent ; outer margin tawny ochraceous, especially below apex and near hinder angle.—Hindwing : postdisco-submarginal patches C— $R^1$  much larger than the others, confluent, all the others separated, sometimes touching each other ; marginal line very little darker than disc.

Butler's and Moore's figures of the ♂ disagree considerably ; though Moore says that his figure was taken from a ♂ "identical with the type." The form seems to be distinguishable from the not-banded examples from the more eastern parts of India, but the few specimens we have seen vary *inter se*.

*Hab.* N.W. India and Nepal ; 1 ♀ in the Tring Museum.

The insect is rare. Doherty, *l.c.*, records it from "Kapkot on the Sarju, perhaps the western limit of the group ; also, Eori and Káli valleys." He adds : "my specimens seem to correspond well enough with Mr. Butler's figure and description, but the markings are not very constant."

Mackinnon, *l.c.*, found it "near Mussoorie in September at 4000 ft. elevation."

### g. *Ch. polyxena polyxena*.

♀. *Papilio Eques Achirus polyxena* Cramer, *Pap. Exot.* I. p. 85. t. 54. f. A.B. (1775) (China tails broken).

*Pavilio Nymphalis Gemmatus polyxena*, Goeze, *Ent. Beytr.* III. 1. p. 288. n. 65 (1779).



- ♀. *Papilio Eques Achirus bernardus* Fabricius, *Ent. Syst.* III. 1. p. 72. n. 223 (1793) (China : descr. from Jones's drawing !).
- ♀. *Papilio bernardus*, Donovan, *Ins. of China* t. 35 (1798) (China).
- Doxocopa epilais* Hübner, *Verz. bek. Schmett.* p. 50. n. 464 (1816-27).
- Nymphalis polyxo* Godart, *Enc. Méth.* IX. p. 399. n. 169 (1823) (China).
- Satyrus bernardus*, Godart, *l.c.* p. 477. n. 2 (1823).
- Nymphalis bernardus*, Doubleday, West. & Hew., *Genera Diurn. Lep.* II. p. 309. n. 35 (1850) (China ; non "N. India.")
- Charaxes bernardus*, Butler, *Proc. Zool. Soc. Lond.* p. 636. n. 54 (1865) (China ; non "N. India.") ; *id.*, *Cat. Diurn. Lep. descr. by Fabr.* p. 59. n. 2 (1869) (China) ; *id.*, *Journ. Linn. Soc. Lond.* XXV. p. 392. n. 125 (1896) (pt. ; China).
- Nymphalis polyxena*, Kirby, *Cat. Diurn. Lep.* p. 272. n. 52 (1871) (part.).
- Charaxes polyxena*, Druce, *Proc. Zool. Soc. Lond.* p. 346 (1873) (China) ; Leech, *Butt. of China, etc.* I. p. 125 (1893) (Owei-shan ; Mupin) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 392. n. 124 (1896) (China).
- Haridra bernardus*, Moore, *Lep. Ind.* II. p. 246 (1896) (Hong-Kong, May).
- Haridra polyxena*, Moore, *l.c.* p. 247 (1896) (S. China).
- Charaxes hierax*, Butler, *l.c.* p. 390. n. 117 (1896) (pt. ; China, ♂.).

Dr. F. Moore describes (*l.c.*) *bernardus* and *polyxena* as two distinct species ; the ♂♂ are indeed as different as the Indian banded and not-banded ♂♂ of *hierax*, but the description of what Moore regards to be the ♂ of *polyxena*, is almost verbally the same as that of the ♀ of *bernardus*. One of the two ♀♀ in the British Museum has the discal band of the forewing much more ochraceous than it is in Cramer's and Donovan's figures, being only slightly paler than the basal area of the wing, while the other ♀ agrees fairly well with those figures ; a ♀ in the Tring Museum has the band almost pure white.

♂. Dichromatic ; in some specimens of the not-banded form there is a vestige of the band in the costal region.

*a*<sup>1</sup>. Forewing with a white band, stopping at SM<sup>2</sup>, bluish at edges, sharply defined, composed of three large patches R<sup>3</sup>—SM<sup>2</sup>, and a small one R<sup>2</sup>—R<sup>3</sup> which is more proximal, two median spots SC<sup>4.5</sup>—R<sup>2</sup>, often absent, and two discal dots SC<sup>5</sup>—R<sup>2</sup>, also often absent ; postdiscal tawny interstitial halfmoons R<sup>3</sup>—SM<sup>2</sup> more or less marked, or absent.—Hindwing : discal interspaces C—R<sup>2</sup> whitish at median bars, the white scaling restricted, shaded with fulvous ; postdisco-submarginal black patches C—R<sup>1</sup> large, extended to outer margin between C and SC<sup>2</sup>, the other patches gradually smaller ; white dots within the patches marked, often absent, except last two.—*Underside* : discal arched bars of both wings tawny, not black, the postdiscal brown or black patches of forewing of other forms vestigial only in costal region ; black basal to submedian bars of hindwing partly obsolete ; tail 3½ mm. long.—♂-f. *polyxena*.

*b*<sup>1</sup>. Forewing without white band, or only with a trace of it in costal region ; median bars SC<sup>6</sup>—SM<sup>2</sup> marked ; postdiscal tawny interstitial spots R<sup>3</sup>—SM<sup>2</sup> marked, variable in size, sometimes also spots R<sup>1</sup>—R<sup>2</sup> present or indicated.—Hindwing : postdisco-submarginal patches more or less contiguous, except the last three, with or without white dots in centre.—*Underside* : discal arched bars feebly marked, tawny, black basal to median bars of hindwing better marked than in ♂-f. *polyxena* ; postdiscal patches of forewing vestigial or absent ; tail as in preceding form, rather broad and long. Scarcely distinguishable from the Indian form *hierax* (see p. 333).

♂-f. *sinensis* Rothsch., nom. nov. (*polyxena*, Moore non Cramer).

♀. *Forewing above*, discal band varying from yellowish white to pale ochraceous, the extremes can be matched with the two forms of the ♂ ; the band stopping short at SM<sup>2</sup> ; median bars SC<sup>6</sup>—R<sup>2</sup> present or not, postdiscal interstitial

spots variable in size and number.—Hindwing: postdisco-submarginal black patches separated, except upper two, or more or less contiguous; discal interspaces C—R<sup>2</sup> very restricted white or whitish ochraceous at outer side of median bars, the whitish scaling not extended to the black postdisco-submarginal patches, not even in the examples with the band of the forewing nearly pure white.—*Underside*: discal arched bars better marked than in ♂, but more tawny than in Indian ♀♀, basal to submedian bars sometimes partly obsolete; white submarginal scaling very variable in extent; postdiscal patches small, tawny, not black.

Length of forewing: ♂, 38—42 mm.

“ “ ♀, 48—53 mm.

*Hab.* China, rare: known from Hong-Kong, Mupin, Omei-shan (W. China). In the Tring Museum 2 ♂♂ and 1 ♀ from between Shanghai and Kiukiang, of the banded form, all three with the bars in the basal half of the hindwing below more or less obsolete; 3 ♂♂ of the not-banded form labelled “China” and Hong-Kong.

## 12. *Charaxes psaphon*.

*Charaxes psaphon* Westwood, *Cab. Or. Ent. t. 21. f. 1, 2* (1848) (Ceylon).

♂ ♀. *Body above* olivaceous tawny ochraceous.

♂. *Wings, upperside*, tawny orange colour.—Forewing: cell-bar 3 generally vestigial; bar D heavy, but occasionally abbreviated behind; median bars very seldom vestigial (but shining through from underside in certain lights); disco-marginal black area very wide, measuring at least 20 mm. in front and 9 to 10 mm. before SM<sup>2</sup>, its edge irregular, the black colour extending basad especially behind R<sup>2</sup> and M<sup>1</sup>, but taken as a whole almost gradually narrowing behind; tawny marginal line sometimes vestigial between veins.—Hindwing: median bars C—R<sup>1</sup> always more or less clearly marked, sometimes also bar R<sup>1</sup>—R<sup>2</sup>, tawny colour at outer side of these bars occasionally rather pale; postdisco-submarginal black patches C—R<sup>2</sup> or C—R<sup>3</sup> so far extended basad as to cover the place where the discal bars would stand, if they were developed, hence forming a large black patch, which becomes narrower behind, veins black near the patch, postdisco-submarginal spots R<sup>2</sup>—SM<sup>2</sup> or R<sup>3</sup>—SM<sup>2</sup> more or less isolated, but often not clearly defined owing to the tawny ground-colour near the postdisco-submarginal spots being generally much shaded with cinnamon; white submarginal dots mostly absent, dot C—SC<sup>2</sup> often well-marked, the two anal ones always present; anal admarginal interspace olive yellow.

*Underside* somewhat variable in general tint; admarginal interspaces of hindwing and sometimes also those of forewing wax-yellow; basal two-thirds of cell of forewing, submedian interspaces of hindwing and proximal portions of discal ones of both wings mostly buff colour.—Forewing: median bars R<sup>2</sup>—SM<sup>2</sup> almost continuous; postdiscal black blotches obvious, submarginal black or brown bars sharply limiting the glossy white scaling at their proximal side; median bar R<sup>1</sup>—R<sup>2</sup> closer to cell than to discal bar R<sup>2</sup>—R<sup>2</sup>.—Hindwing: postdiscal interspaces sometimes with a greenish tint, admarginal line well defined; tail 2½ to 6½ mm. long.

♀. *Wings above* often much darker in basal half than in ♂.—Forewing: cell-bar 3 sometimes rather well marked, also bar 4 occasionally vestigial, upper angle of cell with black scaling, seldom with a white spot; bar D very heavy, median bar R<sup>2</sup>—R<sup>3</sup> fused with it, or absent, median bars R<sup>3</sup>—(SM<sup>1</sup>) often very

conspicuous, seldom obsolete; a white discal band, slightly curved, reaching to  $SM^2$ , but more or less extendedly shaded with orange-ochraceous in front of  $SM^2$ , outer edge of band sinuated between veins; tawny postdiscal interspace  $M^2-SM^2$  mostly marked, sometimes divided into two dots, sometimes there is another postdiscal spot present before  $M^2$ ; spots  $R^1-R^2$  and  $R^3-M^1$  seldom vestigial; outer edge of wing mostly black, but in some specimens somewhat tawny; median bars  $SC^5-R^2$  absent (but showing through from underside).—Hindwing: median bars  $C-R^2$  present, the wing at the outer side of these bars varying from pale orange buff to white, postdisco-submarginal patches  $C-R^1$  broader than the interspace between them and the median bars, the other patches smaller, diminishing in size behind, the last four isolated, the white dots all present, but the third sometimes vestigial only; discal lunules  $R^1-SM^2$  marked as dark shadows between the postdisco-submarginal patches and the discal lunules of the underside, which latter shine through above; admarginal line faintly marked; anal admarginal interspace olive-yellow.

*Underside*: russet brown, seldom more or less dirty buff yellow with the median interspaces russet brown; discal interspaces of both wings varying from pale buff yellow to cream colour, their distal portions (at discal lunules) more or less extended russet brown; submedian interspaces also partly cream colour or pale buff yellow; postdiscal interspaces pale buff yellow at discal lunules; marginal band-like area of forewing as sharply defined as in ♂; admarginal interspaces of hindwing maize yellow, admarginal line sharply defined; upper tail spatulate, 8 to 10 mm. long, second 4 mm. or less.

Penis strongly denticulate, the teeth heavier and more densely set than in the allied species. Penis-funnel comparatively short and broad.

Length of forewing: ♂, 40—44 mm.

" " ♀, 47—52 mm.

*Hab.* Ceylon and South India.

The specimens from South India are, in the opinion of some Lepidopterists, specifically distinct from those obtained in Ceylon. But on examination of a series of individuals from both countries we find that it is impossible to keep them apart specifically. The characters by which Moore and others have thought to distinguish the two "species" are so variable in the specimens of both countries that there is in the *female* sex a complete gradation from one extreme to the other, while in the *male* sex some Ceylonese specimens agree with typical South Indian ones and certain South Indian examples exhibit typically Ceylonese characters. However, the greater percentage of specimens from both countries are distinguishable, in the *female* sex especially, and hence we keep them, with some reluctance, subspecifically separate.

#### a<sup>1</sup>. *Ch. psaphon imna*.

*Charaxes imna* Butler, *Tr. Ent. Soc. Lond.* p. 122. t. 4. f. 2 (1870) ("India"); Nicév., *Bull. of India II.* p. 285. n. 577 (1886) (Orissa; Bombay; Khandalla; Wynaad; Matheran; Travancore; Beypoor); Aitk., *Journ. Bombay N. H. Soc.* I. p. 132. n. 24 (1886) (Matheran, Ghâts, XII. to XIII.); Hamps., *Journ. As. Soc. Beng.* LVII. 2. p. 355. n. 83 (1888) (Nilgiris, 3–4000 ft., rare); Davids. & Aitk., *Journ. Bombay N. H. Soc.* V. p. 278. n. 40. t. A. f. 4. 4a. larva, chrys. (1890) (life hist.); Betham, *ibid.* p. 285. n. 51 (1890) (Centr. Prov.); Ferg., *ibid.* VI. p. 440. n. 82 (1891) (Travancore); Betham, *ibid.* VIII. p. 423. n. 16 (1893) (Matheran, IV. V.); Davids., Bell, & Aitk., *ibid.* X. p. 258. n. 67 (North Canara).

*Charaxes hindia* Butler, *Lep. Exot.* p. 99. n. 5. t. 37. f. 5 ♀ (1872) ("Darjeeling" loc. err.).

(?) *Charaxes prox. hindia*, Nicéville, *Journ. As. Soc. Beng.* LIV. 2. p. 45. n. 53 (1885) (Alipur, near Calcutta, 1 ♀).

*Haridra imna* Moore, *Lep. Ind.* II. p. 231. t. 169. f. 1. 1a. b. c. ♂. ♀, larv., chrys. (1896) (type in coll. Grose Smith; Parasnath Hill, Behar, ♀ = type *hindia* ♀ Butl.; Ranchi, Chota Nagpore; Nagpur; Alipur, Calcutta; Khorda, Orissa; Khandalla, IV. X.; Lanaoli, II.; Coonoor; Nilgiris; Shevaroy Hills; Kathlekan, Mysore, XI.; Travancore; Wynaad; Beypur; Matheran).

♂. The black colour of the upperside in most specimens a little more restricted than in Ceylonese examples, tails shorter on an average; submedian and median bars less obviously bordered white.

♀. Wings above brighter tawny orange than in *psaphon psaphon*; discal band of forewing posteriorly more extendedly shaded over with orange-ochraceous; postdiscal tawny interspaces of forewing more often developed than in the Ceylonese form, the outer edge of the wing often somewhat tawny.

*Hab.* South India to Lower Bengal. In the Tring Museum 8 ♂♂, 5 ♀♀ from: Kanara, Karwar, Kathlekan (Mysore), Travancore, Lanaoli, Marablesliwar.

Though *Ch. psaphon imna* does not seem to be abundant anywhere, it is found in suitable localities all over the peninsula, and goes as far north as Calcutta, if Moore is correct in referring the specimen recorded by Nicéville as *Ch. prox. hindia* (*l.c.*) to *imna*.

The habits of this insect and the life history have been made known by Messrs. Betham, Davidson, Bell, and Aitken.

Mr. Aitken, *l.c.*, 1886, says in his list of the Bombay Butterflies, that he "became aware of the existence of this striking butterfly only last December, when Mr. J. Davidson and I spent part of two days at Matheran in trying to capture two specimens, or rather, I should say, one specimen, for when we got them we found that only half of each remained. I have found since that the species is by no means uncommon on the ghâts from December till March at least: but it does not put itself in the way of being converted into specimens. It comes out about 10 o'clock, and selecting a tree with bright, shiny leaves, perches bolt upright in the middle of a particular leaf just a foot above the highest point you can reach with your net. Whether by accident or design, the position is fenced on all sides with a creeper whose sharp-curved thorns lay hold of everything that passes them and let go nothing. There the proud creature sits, chasing away any other butterfly that approaches, and returning to the same leaf. If you pelt it with stones, it darts off, takes a short circuit and returns to the same leaf. You may pelt it for an hour with the same result. You may easily circumvent it, however, by erecting a platform of stones under its perch, but your aim must be sure and your stroke sudden, for no other butterfly goes off with such rapidity. There is only one specimen of this in the Society's collection, a male which I caught at Khandalla."

Mr. Betham, *ibid.* V. p. 285, says: "This is truly a beautiful creature. The colours are a deep rich chestnut with a velvety black border in the *male*, relieved in the *female* by a broad white band across the forewing. It has the most powerful flight of any butterfly I know (while *E. athamas* has the fastest), and looks like a bird while on the wing.

"The female is larger than the male and much more conspicuous, because of the broad white band aforesaid. It is, however, a very foul feeder and greedily fond of mhowa, so much so that it can be approached and taken by the fingers while engaged in its meal. One year I took several of these and *C. fabius* and a few *C. athamas*, at a sirris tree, *Acacia speciosa*, which had a bough injured in



some way, and from which a juice exuded. Several other kinds of insects, chiefly ants and flies, were attracted by this juice, and a number of small green bee-eaters, *Merops viridis*, the magpie robin, *Copsychus salemis*, and the king crow or arongo shrike, *Buchanga atra*, were attracted by the insects. The wings of several of the *Charaxes* that I took had bits clipped out of them by the beaks of birds. Toddy is also a good bait for butterflies, after it has fermented a little. I was induced to try it after seeing the attraction the sirris juice had, and I found it very successful."

Messrs. Davidson and Aitken describe the larva thus (*Journ. Bombay N.H.* V. p. 278): "Larva of the usual form, head very broad, outer pair of horns longest, last segment flat, square, and ending in two points; last pair of legs almost aborted; colour rich, dark green, with a large semicircle of pinkish-white in the middle of the back and a yellow lateral line; horns and sides of face rusty brown. We reared three specimens of this on *Aglaia roxburghiana*, a very common tree in Canara, belonging to the order Meliaceae. Among butterflies the length of the larval life seems to be generally proportional to the robustness of the insect in its perfect state; and, as might be expected, *C. imna* is a Methuselah among butterflies. One found on the 6th of October, then evidently a few days old, became a pupa on the 25th of November. The butterfly emerged on the 9th of December. Like most smooth caterpillars, this species eats its skin when cast, but not the head case. When touched it appears to use its horns defensively, as does also *C. athamas*."

#### b. *Ch. psaphon psaphon*.

*Charaxes psaphon* Westwood, *Cub. Or. Ent.* t. 21. f. 1. 2. ♂ (1848) (Ceylon); Butl., *Proc. Zool. Soc. Lond.* p. 636. n. 52 (1865) (Ceylon); Nicév., *Butt. of India* II. p. 284. n. 576 (1886) (Ceylon); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 390. n. 116 (1896) (Ceylon).

*Nymphalis psaphon*, Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 36 (1850) (Ceylon).

*Nymphalis polyxena* var. *c*, *C. psaphon*, Kirby, *Cat. Diurn. Lep.* p. 272. sub n. 52 (1871) (Ceylon).

♂. *Haridra psaphon*, Moore, *Lep. of Ceylon* I. p. 30. t. 15. f. 2. ♂ (1880) (Ceylon); id., *Lep. Ind.* II. p. 230. t. 168. f. 1. 1a. 1b. 1c. ♂, ♀ (1896) (Ceylon).

♀. *Haridra serendiba* Moore, *Lep. of Ceylon* I. p. 30. t. 15. f. 3. ♀ (1880) (Ceylon).

♂. Black area of forewing barely 3 mm. distant from bar D, measured behind  $R^3$ ; black area of hindwing produced basad along  $SC^2$  to near median bars, the area almost gradually narrowing behind, or suddenly restricted at  $R^3$ , seldom restricted in width behind  $R^1$  as in typical *imna*.

♀. Upperside more brownish tawny than in *imna*; discal band of forewing pure milky white down to ( $SM^1$ ), very slightly shaded with orange-ochraceous between ( $SM^1$ ) and  $SM^2$ ; discal band of hindwing mostly a little broader and more white than in *imna*; postdisco-submarginal patches  $R^1$ — $R^3$  generally somewhat larger than in ordinary specimens of *imna*.

*Hab.* Ceylon. 8 ♂♂, 3 ♀♀ in the Tring Museum. Moore, in *Lep. Ind.*, records it from Arisvawalle (March), Trincomali (August), Kandy, Kanthalla (October).

#### 13. *Charaxes borneensis*.

*Charaxes borneensis* Butler, *Lep. Exot.* p. 16. t. 6. f. 2 (1869) (♂ only, Borneo); Druce, *Proc. Zool. Soc. Lond.* p. 346 (1873) (Borneo); Dist., *Rhop. Mal.* p. 433. n. 10. t. 37. f. 6. ♂ (1886) (Mal. Pen.); Hagen, *Iris*. IX. p. 187. n. 247 (1896) (N.E. Sumatra); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 394. n. 128 (1896) (Borneo).

*Nymphalis polyxena* var. b. *C. borneensis*, Kirby, *Cat. Diurn. Lep.* p. 273. sub n. 52 (1871) (Borneo).  
*Choraxes (Haridra) borneensis*, Nicéville & Martin, *Journ. As. Soc. Beng.* LXIV. p. 437. n. 261  
 (1895) (N.E. Sumatra).  
*Haridra borneensis*, Moore, *Lep. Ind.* II. p. 247 (1896) (Mal. Pen. ; Borneo).

♂. *Wings, upperside*, tawny or russet tawny, sometimes much shaded with black.—Forewing: upper angle of cell mostly blackish, generally with some white scales, which occasionally are so numerous as to form a distinct spot; bar D heavy in front; median bars  $SC^5$ — $R^2$  joined to the black outer area, seldom isolated, and then obsolete, sometimes also joined to bar D, in which case the white discal band is, between  $R^2$  and  $SC^{4,5}$ , represented by two or four small spots only; median bar  $R^2$ — $R^3$  close to bar D, with which it is often fused, bars  $R^3$ — $M^2$  always present, arched, the second occasionally small, bars  $M^2$ — $SM^2$  thinner, seldom absent; discal bars all fused with, or joined to, the black outer area, postdiscal interspaces  $R^1$ — $SM^2$  seldom all marked, then the upper ones minute, more or less white, often only the submedian, double, spot present, seldom all these spots absent; discal interspace white, or slightly yellowish as a rule, this colour mostly extending a little basad along  $R^3$ — $M^1$ , and  $M^2$ , so that the median bars  $R^3$ — $M^2$  have in most specimens some white scaling at their proximal side; seldom are these bars entirely separated from the tawny area: the white band is distally concave between the veins, the veins themselves more or less black within the band, the partitions  $R^2$ — $M^1$  of the band often less than a third the size of partition  $M^2$ — $SM^2$ , the band generally not extending beyond  $SM^2$ , but in some individuals there is white scaling also behind  $SM^2$ .—Hindwing: median bars  $C$ — $R^2$  more or less obvious, with pale tawny or whitish scaling at outside, at least between  $C$  and  $SC^2$ , this scaling palest in the darkest individuals; postdisco-submarginal patches varying in size, patches  $C$ — $R^1$  large, but generally ill-defined, the black colour extending basad along veins, about as broad as the interspace between them and the median bars, patches  $R^2$ — $SM^2$  much smaller, separated from one another, the white submarginal dots situated just at their proximal edge or a little within the black patches; the upper white submarginal dots seldom marked; admarginal line brown; the disco-marginal area often much shaded with black, the tawny admarginal interspaces sometimes obsolete; discal lunules faintly indicated in the darkest examples by dark clouds.

*Underside* very constant in general appearance, blackish bistre brown, outer marginal region pale sepia and olive; sub-basal to median bars conspicuously edged with white, no white discal patches.—Forewing: median bars  $R^3$ — $SM^2$  more or less angle-shaped, bar  $R^2$ — $R^3$  more proximal than bar  $R^3$ — $M^1$ ; upper postdiscal bars replaced by more or less obvious, but ill-defined, spots.—Hindwing: discal, deeply arched, lunule  $C$ — $SC^2$  closer to the respective median bar than this is to submedian bar  $C$ — $SC^2$ ; upper two or three submarginal dots absent; upper tail short, triangular, second just indicated.

♀. *Wings, upperside* darker than in ♂.—Forewing: interspace between median bars  $SC^5$ — $M^1$  and cell filled up with black, of the three black patches thus formed the middle one is much shorter than the others, median bar  $M^1$ — $M^2$  more proximal than the outer edge of the black patch in front of it, also somewhat dilated; discal band extending to internal margin, where it is, however, shaded with tawny; postdiscal spots  $R^1$ — $SM^2$  generally larger than in ♂, the upper two or the second sometimes absent.—Hindwing: median bars  $C$ — $R^1$  black, the following ones down to  $M^1$  more or less vestigial; discal bars  $R^1$ — $SM^2$  marked as dark luniform

clouds, the bars C—R<sup>1</sup> completely fused with the postdisco-submarginal patches ; discal interspaces white or yellowish white in front, this colour shading off behind into tawny, forming an irregular band which extends to near abdominal fold, but is very indistinct behind ; postdiscal-submarginal patches R<sup>1</sup>—SM<sup>2</sup> larger than in ♂, often touching each other, sometimes their postdiscal portions well developed, in which case the linear, white, submarginal spots stand in the centres of the patches, outer edges of the patches (submarginal bars), however, always deeper black than rest of the patches ; admarginal line more distinct than in ♂.

*Underside* similar to that of ♂, but proximal portions of discal interspaces cream colour, outer marginal region of both wings also much paler than in ♂, the discal lunules bordered with cream colour distally ; submedian interspaces more or less creamy, at least at bars.—Forewing : median bar R<sup>3</sup>—M<sup>1</sup> much more distal than the bars R<sup>2</sup>—R<sup>3</sup> and M<sup>1</sup>—M<sup>2</sup>, interspace between median bars SC<sup>5</sup>—R<sup>2</sup> and cell coloured like rest of median interspaces.—Hindwing : line of median bars much broken ; postdiscal bars broad, deeply triangularly concave, proximally shading into the raw umber colour of the postdiscal interspaces, bar SC<sup>2</sup>—R<sup>1</sup> sometimes absent ; upper tail 7 mm. long, not spatulate, second tail just indicated.

Length of forewing : ♂, 41—45 mm.

” ” ♀, 47—50 mm.

*Hab.* Borneo ; Sumatra ; Malay Peninsula ; much rarer than *Ch. polyxena repetitius* of the same countries.

In the Tring Museum : 5 ♂♂, 2 ♀♀ from Borneo ; 8 ♂♂ from the Gayoe and Battak countries of N.E. Sumatra ; 1 ♂ from the Palembang district, S.E. Sumatra ; 1 ♀ from the Malay Peninsula. The last-mentioned ♀ has the postdisco-submarginal patches of the hindwing larger than the Bornean examples. Dr. Hagen says that he received this insect only from the Gayoe countries in Sumatra, but rather commonly, and that he caught one example at Singapore ; and notes the variability of the specimens as regards the white band of the forewing. Dr. Martin also notices that it was caught only in the forests west and north of Selesseh by the Gayoes, except a few specimens from the Battak Mountains.

#### 14. *Charaxes bupalus*.

*Charaxes bupalus* Staudinger, *Iris* II. p. 84 (1890) (Palawan, ♂, ♀) ; Butl., *Journ. Lim. Soc. Lond.* XXV. p. 394. n. 127 (1896) (Palawan).

*Haridra bupalus*, Moore, *Lep. Ind.* II. p. 247 (1895) (Palawan).

♂. Similar to *Ch. borneensis*, but the band of the forewing above is pure white, more regular, sharply limited by the median bars R<sup>2</sup>—SM<sup>2</sup> which stand in a regular oblique, row, bar R<sup>3</sup>—M<sup>1</sup> being less distal than in *borneensis* ; there are no postdiscal spots marked.—Hindwing : median bars C—R<sup>2</sup> marked, the following one vestigial, there is a little white scaling at bar C—SC<sup>2</sup> ; postdisco-submarginal patches R<sup>1</sup>—M<sup>1</sup> larger than in *borneensis*.

*Underside* tawny russet, postdiscal interspaces more tawny, the subbasal and submedian bar much less edged with white than in *borneensis*, lines of bars much more regular.—Forewing : median bars R<sup>2</sup>—SM<sup>2</sup> continuous, with or without yellowish white patches at their outer side.—Hindwing : median bars SC<sup>2</sup>—M<sup>2</sup> nearly continuous, very much closer to discal lunules than to submedian bars ; white submarginal spots linear, heavy, except the third ; admarginal interspaces pale tawny ; admarginal line tawny ; upper tail 4½ mm. long, second a short tooth.

♀. *Upperside*.—Forewing: discal band pure white, broader than in *borneensis*, especially anteriorly; median bars  $SC^5-R^2$  within the band, the interspace between them and the cell not filled up with black; median bar  $R^3-M^1$  close to apex of cell, with white scaling all round; postdiscal interspaces  $R^1-SM^2$  white, partly tinged with tawny, somewhat longer than in *borneensis*; some white scales in upper angle of cell and at  $M^2$  proximally of median bars.—Hindwing: median bars  $C-M^1$  almost continuous, with a white discal band at the outer sides which is broader than in *borneensis*, and shades posteriorly into tawny olive, the white scaling anteriorly almost reaches between the veins the black postdisco-submarginal patches, and extends distad also posteriorly upon the internervular folds; postdisco-submarginal patches becoming gradually smaller behind, the upper two patches not being twice the size of the following two, black scaling produced basad upon veins  $C-R^1$ ; white submarginal spots linear, heavy; admarginal interspaces brighter tawny than in *borneensis*.

*Underside*, median interspaces about as dark as in *borneensis*, outer half of wing more or less yellowish cinnamon, postdiscal patches of forewing and outer portions of postdiscal interspaces of hindwing dark tawny olive; discal interspaces more white than in *borneensis*, the white colour also more extended.—Forewing: median bars  $R^2-M^1$  continuous, bar  $M^1-M^2$  a little more proximal.—Hindwing: line of median bars  $C-M^2$  less irregular than in *borneensis*, with the discal interspaces about half the width of the median ones; admarginal interspaces dark straw-yellow: white submarginal spots linear, heavy, all marked; admarginal line conspicuous; upper tail not, or not distinctly, spatulate, second tail longer than in the allied white-banded *Charaxes*, mostly curved costad as in *antonius*.

Length of forewing: ♂, 44 mm.

” ” ♀, 52 mm.

*Hab.* Palawan. In the Tring Museum 3 ♂♂, 1 ♀, collected by Dr. Platen and Mr. Waterstradt.

### 15. *Charaxes plateni*.

♂ ♀. *Charaxes plateni* Staudinger, *Iris* II. p. 82 (1889) (Palawan); Semper, *Tafel. Philipp.* p. 335. n. 517 (1892) (Palawan); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 390. n. 115 (1896) (Palawan). *Haridra plateni*, Moore, *Lep. Ind.* II. p. 248 (1896) (Palawan).

♂ ♀. Body above dark tawny, thorax and head with an olivaceous green tint; underside pale cream-buff, tibiae a little more buff, palpi white.

♂. *Wings, upperside*, dark tawny orange.—Forewing: black outer area extended to apex of cell, the black scaling produced basad along  $SC$  to middle of cell, bar  $D$  separated from black area by a small tawny spot, inner edge of the area very oblique, crossing  $SM^2$  about 10 mm. from tip of vein, no tawny spots within black area; cell-bar 3 faintly vestigial.—Hindwing: median bars  $C-R^1$  marked, the following one vestigial, interspace at outer side of bars  $C-SC^2$  pale tawny orange; discal uniform bars  $R^3-SM^2$  more or less faintly indicated by brown clouds, discal bars  $C-R^3$  completely fused with the respective postdisco-submarginal patches, but there are generally some tawny scales left in front of  $R^3$ ; white submarginal dots all developed, but the third often only vestigial; tawny admarginal interspace  $C-SC^2$  absent, the following one sometimes partly marked; brownish marginal line indistinct.

*Underside*: creamy white, silvery in side light, outer margin of forewing, and postdiscal interspaces of hindwing olive yellow or yellowish olive, postdiscal



interspaces of the forewing somewhat clouded with the same colour; admarginal interspaces of the hindwing yellowish wood brown to yellowish buff; subbasal and median interspaces more or less pale olive brown; bars rather weak.—Forewing: interspaces between submedian and median bars  $M^1$ —( $SM^1$ ) of about equal width.—Hindwing: admarginal line tawny cinnamon, clearly defined; upper tail  $4\frac{3}{4}$  to  $5\frac{1}{2}$  mm. long, second  $1\frac{3}{4}$  mm.

♀. *Wings above* olive tawny.—Forewing: upper angle of cell somewhat blackish, cell-bar 3 vestigial at SC; bar D heavy; median bars  $SC^2$ — $SC^2$  heavy, upper 2 only  $3\frac{1}{3}$  mm. from upper angle of cell, no white scaling at basal side of bars; discal band white, broadest (11 mm.) between  $R^1$  and  $R^2$ , narrowest behind  $R^2$ , extended to C (not to edge of wing), shaded with olive tawny at internal margin of wing, its outer edge sinuate between veins  $R^2$ — $SM^2$ ; an elongate post-discal, buffish, spot between  $M^2$  and  $SM^2$ .—Hindwing: median bars C— $R^3$  forming a black continuous line, curving basad, sharply limiting the olive tawny colour of the basal region, crossing  $R^2$  3 mm. from D; a broad white, faintly yellowish, band from costal margin to  $M^1$  posteriorly shading into olive tawny, 9 mm. wide at  $SC^2$ , little narrower behind; discal bars  $R^1$ —( $SM^1$ ) clearly defined, continuous, luniform, separated from the black postdisco-submarginal patches by olive tawny interspaces, these interspaces becoming wider behind, interspace  $SC^2$ — $R^1$  vestigial, discal bar C— $SC^2$  completely fused with postdisco-submarginal patches; the latter heavy, patches  $R^1$ — $M^1$  of the same size (7 mm. in diameter), the following one somewhat smaller, all these not separated; white submarginal spots rather heavy; admarginal olive tawny interspaces all developed except the first, anal one filled up with olive buff scaling.

*Underside* as in ♂; upper tail spatulate, 8 mm. long, second 4 mm.

Length of forewing: ♂, 40—42 mm.

“ “ ♀, 46 mm.

*Hab.* Palawan, 8 ♂♂. One female in Dr. Standinger's collection. The white underside distinguishes this species from all allies. The most interesting feature of the ♀ is the development of the discal, luniform, bars of the upperside of the hindwing, which do not appear with the same distinctness in any other tawny *Charaxes*.

## 16. *Charaxes antonius*.

*Charaxes antonius* Semper, Verh. Ver. Nat. Unterh. Hamburg III. p. 113 (1878) (Mindanao); *id.*, Tauf. Philipp. p. 80, n. 100, t. 14, f. 6, 7, ♂, 8, ♀ (1887) (Mindanao; non ♀ Guimaras, = *amyceus*); Butl., Journ. Linn. Soc. Lond. XXV. p. 389, n. 114 (1896) (Mindanao). *Haridra antonius*, Moore, Lep. Ind. II. p. 248 (1887) (“Philippines”).

♂ ♀. Body above raw umber colour, head and thorax with an olive-green gloss. Underside brownish sepia colour; palpi cream colour, middle of prosternum and the tibiae and tarsi somewhat darker; femora black with a dense sprinkling of white scales.

♂. *Wings above* glossy tawny olive.—Forewing: black outer area extending to upper angle of cell, strongly narrowing behind, about 9 to 10 mm. wide at  $SM^2$ , its edge not sharply defined, bar D faint, no other bars present, no postdiscal spots.—Hindwing: discal bars vestigial as dark luniform clouds, often extremely faint, upper two fused with the postdisco-submarginal patches; of the latter series the upper four are fused together, and generally also with the admarginal line, patches  $R^3$ — $SM^2$  isolated, their proximal portions obsolete.

*Underside* brown sepia colour, variegated with bistre.—Forewing : median bars  $R^2$ — $SM^2$  continuons, median interspace  $M^2$ — $SM^2$  narrower than interspace  $M^1$ — $M^2$ , the darker median band hence narrowing behind, median bars  $SC^5$ — $R^2$  somewhat nearer discal series than apex of cell.—Hindwing : interspace between submedian and median lines of bars from costal margin to M resp.  $R^3$  narrower than in *borneensis*, upper two median bars  $CM$ — $SC^2$  nearly continuous ; postdiscal bars slightly arched, or almost straight, standing in a straight line ; upper tail somewhat spatulate, about 8 mm. long, second tail also widened towards apex, curving costad, 6 mm. long.

♀. Wings *above* slightly paler.—Forewing : a white band with a faint tawny olive tint, posteriorly strongly shaded with fawny olive, extends from  $SC^{45}$  to internal margin, the band is widest in middle, anteriorly it reaches apex of cell, its outer edge (taken as a whole) is convex, its inner edge ill-defined ; postdiscal spots  $R^3$ — $SM^2$  luniform, separated from discal band by black, thin, discal lunules, postdiscal spots  $SC^5$ — $R^2$  about 7 to 8 mm. distant from band ; no median bars  $SC^5$ — $R^2$ , nor any other median bars.—Hindwing : median  $C$ — $SC^5$  extremely faint, discal bars  $C$ — $R^1$  ill-defined, partially separated from postdisco-submarginal patches by two light patches : scaling between these discal bars and the vestigial median bars somewhat greyish, veins  $SC^5$  and  $R^1$  especially pale ; postdisco-submarginal purplish black patches  $C$ — $R^3$  gradually decreasing in size, fused, the following four separated, with the postdiscal portions obsolete, the submarginal portions deep black ; submarginal white spots linear, heavy ; admarginal interspaces  $C$ — $R^1$  obsolete.

*Underside* somewhat paler than in ♂, the submedian and discal interspaces partly creamy buff, but not white ; postdiscal and admarginal interspaces of hindwing greenish bistre ; bars nearly as in ♂, upper three submedian and median bars of hindwing continuous ; upper tail strongly spatulate, 9 mm. long, second almost boot-shaped, curving costad, broadest in middle, about 7 mm. long.

Length of forewing : ♂, 37—41 mm.

♀, 50 mm.

*Hab.* North, East, and South-East Mindanao. In the Tring Museum 2 ♂♂, 1 ♀, collected by Dr. Platen (received from Messrs. Staudinger and Bang-Haas) ; May, August to October, December to March, according to Semper.

*ℓ*<sup>6</sup>. ♂, forewing above blue ; ♀, white band of forewing interrupted at  $R^2$

## 17. *Charaxes mars*.

♂ *Charaxes mars* Staudinger, *Exot. Tagf.* p. 172 (1886) (Minahassa, N. Celebes).

♀ *Charaxes mars*, Oberthür, *Bull. Soc. Ent. France*, p. 194. f. 12 (1897) (Maros country).

♂. *Upperside* of body olivaceous black, sides faintly fulvous, abdomen russet. *Underside* of palpi and abdomen, and four posterior tibiae and tarsi pale drab or wood brown, sterna brownish black.

♂. *Wings above*.—Forewing : strongly glossy greenish blue, changing into bluish green in side light, costal and outer margins black with a slight greenish gloss.—Hindwing also glossy blue, especially if viewed from behind, except base, abdominal fold, and costal margin ; the greater part of the wing tawny orange, cellules  $C$ — $R^1$  nearly totally black, cell more or less shaded with black : postdisco-

submarginal black patches mostly touching admarginal line between veins, white submarginal dots minute or obsolete.

*Underside* olivaceous slate-colour, with greenish and purplish reflections in side light, glossy except postdiscal interspaces and, on forewing, part of median interspaces; submedian bars edged proximally, median bars distally, with white; postdiscal interspaces mostly somewhat ochraceous at discal bars, this colour more extended anteriorly on forewing.—Forewing: median bars nearly continuous; outer edge of wing glossy to postdiscal, indistinct, bars, glossy band wider in middle than behind; white submarginal scaling visible in a front view, much reduced, except at apex of wing.—Hindwing: bars on abdominal fold obsolete; series of median bars crossing M just at origin of  $M^1$ ; black and blue submarginal dots present, white ones generally obsolete; admarginal interspaces somewhat brown, narrow, last one yellowish as a rule; admarginal line very thin, not conspicuous, separated from edge of wing; upper tail 5 to 6 mm. long, second a very short tooth.

♀. According to Oberthür's description and cut: *Wings above*: black, slightly bluish, this colour shading off into the brown-yellow colour of the base and external margin; discal interspaces white, forming a broad band from  $R^2$  to internal margin, the two spots  $SC^5-R^2$  more distal and separated; postdiscal interspaces  $SC^4-SM^2$  uniform, heavy, not so large as the black discal patches at their proximal side, tawny.—Hindwing: tawny; postdisco-submarginal black patches  $C-R^2$  large, not completely fused, patches  $R^2-M^2$  about half the size of patch  $R^1-R^3$ ; submarginal white dots all present, upper two largest; median bars  $C-R^1$  marked as black spots, discal interspace occupied by a white band in front, which shades off into the tawny ground-colour; basal area up to median bars tawny brown; admarginal line very thin (as in ♂), partly well separated from the brown edge of the wing; admarginal interspaces all marked, but the upper ones narrow.

*Underside* paler than in ♂, discal interspaces (except distal portions) white; submedian interspaces partly white; postdiscal interspaces yellowish at discal lunules; tail broader than in ♂, not spatulate.

Length of forewing: ♂, 36—41 mm.

” ” ♀, 48 mm.

*Hab.* Celebes.

The two specimens of *Charaxes mars* found by Dr. Platen in North Celebes, Minahassa, and those obtained by W. Doherty in South Celebes differ in some details, as most butterflies from North and South Celebes do. This beautiful species does not seem to have been met with by any other explorers than Platen and Doherty. Neither A. Everett nor H. Fruhstorfer came across it during their stay in Celebes.

#### a. *Ch. mars dohertyi*.

*Charaxes mars* Staudinger var. *dohertyi* Rothschild, *Iris* V. p. 437, t. 6. f. 2 ♂ (1892) (S. Celebes, Maros country); Oberth., *Bull. Soc. Ent. France* p. 194. f. 12 ♀ (1897) (Maros country, Petoenoeang, Asoewe, July 14. 1896).

♂. *Wings above* on the whole more extended blue than in *mars mars*; hindwing: tawny colour reaching costad beyond  $R^1$ , there being a tawny spot in front of that vein, sometimes another before  $SC^2$ , postdisco-submarginal patches  $R^3-M^2$  isolated, patch  $R^2-R^3$  almost isolated, patch  $M^1-M^2$  about as broad as long.

♀. Description see above.

*Hab.* South Celebes, 7 ♂♂ : Maros country, W. Doherty, August—September 1892; both sexes in coll. Oberthür caught by W. Doherty between Maros and Tjamba.

*b. Ch. mars mars.*

*Charaxes mars* Staudinger, *Exot. Tagf.* p. 172 (1886) (Minahassa); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 396. n. 133 (1896).

♂. Tawny colour of *upperside* of hindwing not reaching in front of  $R^1$ ; black postdisco-submarginal patches all fused together (except dots  $M^2S-M^2$ ), patch  $M^1-M^2$  elongate, vein  $R^3$  and outer half of  $M^1$  black, tawny admarginal interspaces  $SC^2-R^2$  faintly indicated; tail shorter than in *mars dohertyi*.

♀. Unknown.

*Hab.* Minahassa, N. Celebes: 1 ♂ in Dr. Staudinger's collection, another in that of Mr. Adams (ex coll. Houtath).

18. *Charaxes madensis* (Nov. Zool. VI. t. 8. f. 4.).

*Charaxes madensis* Rothschild, *Entom.* XXXII. p. 172. n. 2 (1899) (Mt. Mada, Buru).

♂. Unknown. Most likely resembling that of *Ch. mars*.

♀. Allied to *Ch. mars*. *Upperside*.—Forewing: blackish brown, no blue tone, white discal band broader than in *mars* ♀, farther from cell, its inner edge deeply concave at  $M^2$ , discal bars  $R^3-M^2$  vestigial within band, postdiscal interstitial patches  $R^3-SM^2$  completely merged together with band, while in *mars* they are separate.—Hindwing: band more sharply defined than in *mars*, narrower, white, the blackish brown postdisco-submarginal area much wider than in *mars*, posterior postdisco-submarginal patches not separated from one another, at least four times as wide as in *mars*.

*Underside*: white scaling of forewing anteriorly more extended than in *mars*, the black median bars are more distal, and the distal ones much feebler; the black submarginal spots of the hindwing are well marked and stand about 4 mm. from the edge of the wing.

Length of forewing: ♀, 60 mm.

*Hab.* Mt. Mada, Buru, 3,000 ft., August 1898 (Dumas).

The basal costal bar of the hindwing below is not marked in the figure, but is vestigial in the rather damaged specimen.

$b^5$ . Basal to median bars of underside pale chestnut, white band of forewing above narrower behind.

19. *Charaxes ocellatus*.

♀. *Charaxes ocellatus* Fruhstorfer, *Societ. Ent.* XI. p. 108 (1896) (Lombok, 2000 ft.); *id.*, *Berl. Ent. Zeitschr.* XLI. p. 388. t. 9. f. 4. (1897).

♀. *Charaxes sumbanus* Rothschild, *Entom.* XXIX. p. 308 (1896) (Sumba; Sambawa).

♂♀. *Body* above tawny, thorax somewhat olivaceous; *underside* creamy white.

♂. *Wings* above chestnut-tawny, forewing darker than hindwing, outer region of forewing and postdisco-submarginal patches of hindwing black.—Forewing falcate, crossed by an oblique discal band of pure white patches, the band not reaching  $SM^2$ , widest in front, bordered proximally by the median bars  $R^2-SM^2$  and



bar D, median bars  $SC^5-R^2$  within band, bars  $R^3-M^2$  arched, patch  $M^2-SM^2$  very much smaller than the one before it; one or two whitish or pinkish buff postdiscal spots between  $SC^4$  and  $R^1$  about halfway between band and apex, the second spot mostly absent, sometimes both scarcely traceable; internervular folds with buffish longitudinal lines at margin; fringe white except at veins.—Hindwing; median bars  $C-R^3$  present, standing in an obliquely curved row, bars  $R^3-M^2$  also often indicated, more proximal than bar  $R^2-R^3$ , a series of patches at the outer side of these bars, the upper one white and largest, the other gradually becoming smaller and more and more tawny; discal bars luniform, dark tawny, or blackish, the upper ones forming the border of the pale discal patches often obsolete, the series strongly and obliquely curved; postdisco-submarginal black patches very large, the upper two always fused together, mostly the upper four not separated, patch  $SC^2-R^1$  10 mm. long, the patches becoming gradually smaller, they are separated from the discal bars by ochraceous halfmoons; white submarginal dots all present, the upper two the largest, the last three sometimes vestigial; admarginal interspaces ochraceous, the last three joined along veins to postdiscal lunules of the same colour, the upper four more restricted, separated between veins into dots, in which case cellule  $S-SC^2$  has no such admarginal spots, the black postdisco-submarginal patches being completely fused to the margini-admarginal line, or the spots are not divided at internervular fold; admarginal line touching postdisco-submarginal patches at veins  $C-R^3$ , extended to edge of wing, black in front, more tawny behind, tails dark tawny or blackish, tips edged with buff or white, fringe white between veins.

*Underside* fawn-colour, basal to median bars pale chestnut, heavy, basal cell-spot present on both wings.—Forewing: cell-bar 4 touching M closer to  $M^2$  than  $M^1$ , its shorter costal portion curved, about at right angles to the longer and obliquely placed hinder portion: median bars  $M^2-SM^2$  very oblique, reaching  $SM^2$  8 mm. from end, hence median interspace considerably widening behind; white band as above, posteriorly bordered by the discal bars, but as the series of bars is almost parallel to margin it recedes costad more and more from band, the interspace is pale drab; discal bars outwardly bordered with creamy scaling which forms generally halfmoons; postdiscal bars represented by patches of variable and different size, patches  $M^1-SM^2$  black, triangular, the others somewhat chocolate, the submedian ones fused together, but generally incised externally upon ( $SM^1$ ), patches  $R^2-M^1$  and  $SC^5-R^1$  much smaller, often also patch  $R^1-R^2$ , outwardly the postdiscal spots bear whitish, triangular dots, or greyish lunules, except the last patch, which is bordered externally with a bluish grey, sometimes M-shaped, patch; admarginal interspaces more or less grey.—Hindwing: median series of bars obliquely curved from C to  $R^3$ , then again from  $R^3$  to ( $SM^1$ ), forming an angle upon  $R^3$ , bars  $M^2-SM^2$  forming an acute angle upon ( $SM^1$ ) pointing basad, often reaching the angle which is formed by the respective submedian bars and which points distad; basal and subbasal costal bars present; a longitudinal line upon fold  $SM^2-SM^3$  as in *orilus*;  $SM^2$  mostly chocolate in middle; discal interspaces filled up by a white band which is more or less widely separated from the discal lunules by rather well-defined continuous patches of isabella colour; discal and postdiscal bars luniform, the former not prominent, partly obsolete, separated from the postdiscal ones creamy lunules which are somewhat thicker than the discal bars; postdiscal bars chestnut, bars  $C-SC^2$  and  $R^1-R^2$  are always patch-like, while bar  $R^3-M^1$  and mostly also bar  $SC^2-R^1$  are thin; submarginal white dots present, but spot  $R^3-M^1$  sometimes

inconspicuous owing to the respective interspace between the black and blue submarginal dot and postdiscal bar being much shaded with cream colour; admarginal interspaces cream-buff, small; admarginal line pale drab; edge of wing greyish between veins; tails pale drab, creamy at tips, both somewhat spatulate, upper 9 to 9½ mm. long, second slightly curved costad, 7 mm. long.

♀. Like ♂, but somewhat larger, forewing above slightly darker in basal half, tails somewhat longer.

Length of forewing: ♂, 38—40 mm.

" " ♀, 44—50 mm.

Penis similar to that of *Ch. orilus*.

*Hab.* Lombok, Sambawa, Flores, and Sumba.

This very remarkable insect, discovered by W. Doherty in February 1896 on Sambawa and Sumba, was shortly afterwards also found on Lombok by W. Fruhstorfer. The name of *ocellatus* has two or three days' priority over that of *sumbanus*, and hence must be employed to designate the species.

The close relationship of *Ch. ocellatus* with the very aberrant-looking Timorese *Ch. orilus* becomes apparent on comparison of the coloration of the underside; the penis has also a close resemblance in both insects, its dentition being peculiar to these two species.

#### a. *Ch. ocellatus sumbanus*.

♀. *Charaxes sumbanus* Rothschild, *Entom.* XXIX. p. 308. n. 1 (1896) (Sumba).

♂ ♀. White band of forewing *above* stopping at SC<sup>5</sup>, with a very few white scales before SC<sup>4+5</sup>; white patch M<sup>2</sup>—SM<sup>2</sup> deeply incised upon (SM<sup>1</sup>) at both sides, 5 mm. long, measuring diagonally 6 mm.—Hindwing: series of median bars C—R<sup>3</sup> more strongly arched than in the other local forms, pale discal spots R<sup>3</sup>—M<sup>2</sup> very indistinct, spots C—R<sup>2</sup> plainly marked in ♀ only; black postdisco-submarginal patch R<sup>3</sup>—M<sup>1</sup> not pointed proximally, the postdiscal half-moon-shaped interspaces deeper ochraceous than in the races from Lombok and Sambawa; white submarginal dots M<sup>1</sup>—SM<sup>2</sup> in ♂, and R<sup>3</sup>—SM<sup>2</sup> in ♀, minute; admarginal ochraceous interspaces C—R<sup>3</sup> not divided into small spots, the uppermost well marked; admarginal line posteriorly and tails rather bright tawny.

*Underside*.—Forewing; median bar M<sup>2</sup>—SM<sup>2</sup> very oblique, posteriorly almost reaching discal bar, discal bar M<sup>1</sup>—M<sup>2</sup> straight, curved only at ends; postdiscal patch R<sup>1</sup>—R<sup>2</sup> little larger than patch R<sup>2</sup>—R<sup>3</sup>, patch M<sup>2</sup>—SM<sup>2</sup> incised outwardly upon (SM<sup>1</sup>), with a bluish grey patch which resembles figure 3.—Hindwing: discal interspace C—SC<sup>2</sup> wider than median one, median bars C—R<sup>1</sup> more proximal than in the races from Lombok and Sambawa; postdiscal chestnut bar SC<sup>2</sup>—R<sup>1</sup> patch-like, heavier than patch R<sup>2</sup>—R<sup>3</sup>, lunules M<sup>1</sup>—SM<sup>2</sup> about 1 mm. thick in middle, admarginal creamy buff interspaces all well marked.

Length of forewing: ♂, 40 mm.

" " ♀, 44 mm.

*Hab.* Sumba: W. Doherty, Febr. 1896, below 2000 ft., 1 ♀; A. Everett, November 1896, 1 ♂.

#### b. *Ch. ocellatus florensis* Rothschild, subsp. nov.

♂ *Wings, above*.—Forewing: white band somewhat curved owing to patches R<sup>3</sup>—M<sup>2</sup> being nearer cell than in the other races, some white scaling in front of

patch  $SC^{1.5}$ — $R^1$ , patch  $M^2$ — $SM^2$  proximally not incised upon ( $SM^1$ ), straight or convex, outwardly incised, measuring  $4\frac{1}{2}$  to 6 mm. in length, and diagonally 6 to 9 mm., black area extending basad behind  $SM^2$  beyond band.—Hindwing : discal bar C— $SC^2$  obsolescent, white discal patch extending to postdisco-submarginal black patch ; median bars C— $R^3$  more arched than in the other races, bar  $R^3$ — $M^1$  visible, the pale spot at its outer side marked ; postdisco-submarginal patches  $R^3$ — $M^2$  not distinctly isolated, the spots touching each other ; white submarginal dots larger than in *sumbanus* ; admarginal spot C— $SC^2$  absent, spots  $SC^2$ — $R^3$  separated into tiny dots ; admarginal line from  $R^3$  to  $SM^2$  and tail darker than in *sumbanus*.

*Underside*.—Forewing : median bars  $M^2$ — $SM^2$  3 to 4 mm. from discal bar at  $SM^2$ , slightly produced basad upon ( $SM^1$ ) into a point ; upper white discal patches more or less pointed outwardly ; discal bars  $SC^1$ — $M^2$  arched, the pale lunules at their distal side conspicuous ; postdiscal patches  $SC^5$ — $M^1$  of about the same size, small, the creamy white dashes or angles at their outer side conspicuous ; greyish white scaling at margin, between veins, also conspicuous.—Hindwing : median bars nearly placed as in *sumbanus*, the series sharply angled upon  $R^3$  ; discal interspace C— $SC^2$  wider between veins than median one ; postdiscal chestnut lunule  $SC^2$ — $R^1$  thinner than patch  $R^2$ — $R^3$ , chestnut halfmoons  $M^1$ — $SM^2$  about 1 mm. thick in middle.

♀. Unknown.

Length of forewing : ♂, 38 to 40 mm.

*Hab.* South Flores, 2 ♂♂ (A. Everett, November 1896, dry season).

### c. *Ch. ocellatus sambavanus*.

♀. *Charaxes sumbanus sumbaranus* Rothschild, *Entom.* XXIX, p. 309. n. 2 (1896) (Bima, Sambawa).

♂. Unknown.

♀. *Wings, above*.—Forewing : a broad white costal streak in front of band ; inner edge of patch  $R^3$ — $M^1$   $1\frac{1}{2}$  mm. more distal at  $M^1$  than edge of patch  $M^1$ — $M^2$ , patch  $M^2$ — $SM^2$  strongly convex distally, but incised upon ( $SM^1$ ) proximally produced basad upon ( $SM^1$ ) into a point ; internal margin with an indistinct ochraceous patch as continuation of band.—Hindwing : discal patch C— $SC^2$  only  $3\frac{1}{2}$  mm. long, discal patches marked down to  $M^2$ , but last one indistinct ; median bars C— $R^3$  blackish as in *florensis*, but not arched or angled ; discal bars dark tawny, not blackish brown ; postdiscal interspaces as pale as the second discal patch, much paler than in *sumbanus* ; postdisco-submarginal patches  $R^1$ — $M^2$  pointed proximally, patches  $R^3$ — $M^2$  isolated ; admarginal spots paler than in *florensis* and *sumbanus*, admarginal line as in *florensis*.

*Underside*.—Forewing : cell-bar 3 separated into a number of dots ; median bar  $M^2$ — $SM^2$  as in *florensis*, rather more angled upon ( $SM^1$ ), bar  $R^3$ — $M^1$  1 mm. beyond bar  $M^1$ — $M^2$ , arched, bars  $SC^5$ — $R^1$  much closer to outer edge of white patches than to bar D, interspace between white band and discal bars darker than in *sumbanus* and *florensis* ; discal bars  $SC^1$ — $M^1$  strongly arched, the pale lunules at their outside very conspicuous ; postdiscal patch  $M^1$ — $SM^2$  not incised outwardly, the grey scaling at its outside more restricted than in the preceding forms, postdiscal patch  $R^1$ — $R^2$  larger than patch  $SC^4$ — $SC^5$ .—Hindwing : median bars C— $R^1$  more distal than in *florensis* and *sumbanus*, discal interspace C— $SC^2$  narrower than

median one; postdiscal bar  $SC^2-R^1$  obsolescent, not chestnut, while chestnut halfmoons  $M^1-SM^2$  are heavy, measuring in middle about 4 mm.: white submarginal dots  $R^3-M^1$  clearer defined than in the preceding forms.

Length of forewing: ♀, 50 mm.

*Hab.* Sambawa: Bima (W. Doherty, February 1896), 1 ♀.

#### d. *Ch. ocellatus ocellatus.*

♀. *Charaxes ocellatus* Frubstorfer, *Societ. Ent.* XI. p. 108 (1896) (Lombok, 2000 ft.); *id.*, *Berl. Ent. Zeitschr.* XLI. p. 388. t. 9. f. 4 (1897); *id.*, *l.c.* XLII. p. 6 (1897).

♂. Unknown.

♀. Like *sambavanus*, but the upper discal patch of hindwing *above* is purer white, the other patches of the discal series, especially patches  $R^2-M^2$ , are better marked, the median and discal bars are blacker. On the *underside*, the median bars  $R^3-M^2$  of the forewing are closer to cell, cell-bar 3 is complete, median bars of hindwing thinner than in *sambavanus*, postdiscal chestnut patch  $C-SC^2$  smaller.

Length of forewing: ♀, 46 mm.

*Hab.* Lombok, 1 ♀ (*type*, H. Frubstorfer) in the Tring Museum.

These differences may be purely individual, but until it is proved that they are so, we must keep the Lombok and Sambawa individuals subspecifically separate.

b<sup>1</sup>. Forewing above with a narrow, creamy, submarginal band, which does not reach the costal margin.

#### 20. *Charaxes orilus.*

♂. *Charaxes orilus* Butler, *Lep. Exot.* p. 13. t. 5. f. 5 (1869) (Timor); *id.*, *Journ. Linn. Soc. Lond.* XXV. p. 357. n. 20 (1896) (Timor).

♂ ♀. *Body above* olive russet, abdomen more chestnut; *underside* cream colour.

♂. *Wings above*, seal brown, basal area, especially of forewing, washed with chestnut.—Forewing: a submarginal band of creamy patches, anteriorly gradually becoming narrower and fading away, at  $SM^2$   $1\frac{1}{2}$  to 6 mm. broad and close to margin, straight, nearly parallel to edge of wing; creamy white marginal spots between veins, small, sometimes produced proximad as a fine line.—Hindwing: discal bars  $C-R^3$  very obscure, just traceable, sometimes with some creamy scales at their distal side, bars  $R^3-SM^2$  mostly better visible, as the interspaces between them and the median bars are generally cream-colour, but the bars are often obsolete, discal bar  $R^3-M^1$  proximal of bent of  $R^3$ ; postdiscal bars much more proximal than in any other *Charaxes*, the upper three patch-like, entirely fused with the brown basal area, bar  $R^2-R^3$  in front of bent of  $R^3$ , luniform, but mostly fused with brown area, as are bars  $R^3-SM^2$ , these latter, however, more distal, bar  $M^1-M^2$  10 mm. from base of  $M^1$ ; submarginal bars represented by black triangular, transverse, spots, of which the upper 4 are somewhat convex proximally and are, between veins, barely 1 mm. distant from the admarginal line, spots  $R^3-SM^2$  smaller; admarginal line complete, rather heavy down to  $R^3$ , thin and often partly obsolete from  $R^3$  to  $SM^2$ ; interspaces between postdiscal and submarginal bars, as well as admarginal interspaces and edge of wing inclusive of tails, yellowish cream-colour, anal region mostly paler, patch  $C-SC^2$  also often whitish, admarginal line extended to near tips of all veins; fringe of both wings white between veins.



*Underside* pale drab or fawn-colour, sometimes ceru drab; basal to median bars light chestnut.—Forewing: basal cell-spot conspicuous, three cell-bars heavy; median bars  $R^3$ — $SM^2$  in a nearly straight row, almost at right angles to veins, bars  $R^3$ — $M^2$  curved distad, ends pointing basad, bar  $R^2$ — $R^3$  about  $1\frac{1}{2}$  to 2 mm. from cell,  $2\frac{1}{2}$  mm. from bar  $R^1$ — $R^2$ ; discal interspaces ceru drab at median bars, this colour forming an inconspicuous band of about 3 mm. width, rest of discal interspaces bistre colour; postdiscal bars strongly arched, black, the series turning basad from  $R^1$  to  $SC^4$ ; postdiscal bars represented by patches, of which the submedian ones are black and nearly fused together, while the others are chestnut, patches  $SC^5$ — $R^3$  and  $R^2$ — $M^1$  small; these patches followed posteriorly by creamy ones, of which only patches  $M^1$ — $SM^2$  are clearly marked, while the others become somewhat conspicuous only in consequence of the submarginal luniform bars, which border them distally, being rather obviously marked in this species; tips of veins chestnut; margin with creamy spots between veins.—Hindwing: median series of bars nearly continuous, curving distad in middle, crossing  $M^1$   $2\frac{1}{2}$  mm. from base of vein; basal costal bar and basal cell-spot present, subbasal costal bar also marked, cell-bar 3 sometimes indicated by a dot; submedian bars  $M$ — $SM^2$  forming together an acute angle which points distad, a pale chestnut line along part of fold  $SM^2$ — $SM^3$ , another, shorter, one behind  $SM^3$ ; discal, strongly arched, bars blackish chestnut, close to median series, the distance being nearly the same from  $C$  to  $M^2$ , about 1 to 2 mm. between veins; postdiscal bars halfmoon-shaped, chestnut, the second, fourth and fifth vestigial, all separated from discal bars by pale halfmoons, of which the last three are cream-colour or yellowish cream-colour; the postdiscal spots outwardly shading into drab, this colour much extended between  $C$  and  $R^1$ ; submarginal black dots shaded proximally with bluish grey scaling, and the upper three, besides, with drab scales, which form a halfmoon the ends of which point distad, the wide interspace between the series of submarginal and postdiscal spots pale cream-colour; admarginal interspaces buff; admarginal line as above, anteriorly broader; veins brown within pale area; upper tail slightly widened beyond middle, 8 to 9 mm. long, second thinner, faintly curved costad, 6 to 7 mm. long.

♀. Like ♂, larger, wings broader, creamy colour slightly more extended; upper tail 9 mm., second 7 mm. long.

Length of forewing: ♂ 39—44 mm.

" " ♀ 47 mm.

Clasper broad, produced into a rather short, evenly curved, slender, but strongly chitinated hook; 10th tergite broadly sinuate, the two processes conical, rather thin; penis with one large tooth standing before the apex and a few minute ones further back (Pl. 8. f. 6.); penis-funnel as in *Ch. marmax*.

*Hab.* Timor and Wetter.

The most interesting feature of this peculiar species is the development of what is in other species a series of white submarginal dots on the hindwing to a very broad band, necessarily accompanied by a basad movement of the postdiscal bars, which in the other species of this group are fused with the submarginal bars. The submarginal band on the upperside of the forewing corresponds to the white submarginal scaling of the underside found in all the tawny *Charaxes*. Dr. Butler, in his Revision of the genus *Charaxes* put *orilus* between *fabi* and *ethocles* from which it is very different both in structure and pattern. It is like *ocellatus* a member of the *polyxena* group.

*a. Ch. orilus wetterensis* Rothsch., subsp. nov.

♂. Differs from the Timor race in the marginal spots of the forewing above being larger and the submarginal band wider, the latter measuring at  $SM^2$  5 to 6 mm., the bar separating patch  $M^2$ — $SM^2$  from the creamy marginal spot narrow, and partly suffused with cream-colour; on the hindwing the submarginal spots  $R^3$ — $SM^2$  are smaller than in *orilus orilus*.

*Underside* drab colour, darker than in the Timor form.

♀. Unknown.

*Hab.* Wetter, May 1892 (W. Doherty), 3 ♂♂.

*b. Ch. orilus orilus.*

*Charaxes orilus* Butler, l.c.

♂. The marginal spots of the forewing *above* minute; submarginal band  $2\frac{1}{2}$  to 4 mm. wide at  $SM^2$ , brown bar separating it between  $M^2$  and  $SM^2$  from marginal spot nearly half the width of the band, not partly obsolete.

♀. Like ♂, but submarginal band somewhat wider behind, bar  $M^2$ — $SM^2$  separating it from marginal spot complete.

*Hab.* Timor: Dili, May 1892 (W. Doherty), 1 ♀; Oinanisa, Dutch Timor, November, December 1891 (W. Doherty), 5 ♂♂.

*d*<sup>3</sup>. Upperside of hindwing with a band of pale blue postdiscal patches.

21. *Charaxes euralus*.

Seba, *Thesaurus* IV. p. 57. t. 46. f. 21. 22 (1764) (Ind. or.).

♂. *Papilio Eques Achirus euralus* Cramer, *Pap. Exot.* I. pp. 116, 153. t. 74. f. A. B (1776) (Amboina); Goeze, *Ent. Beytr.* III. 1. p. 79. n. 36 (1779).

♂. *Papilio Eques Achirus euryalus* (!), Fabricius, *Spec. Ins.* II. p. 20. n. 83 (1781) (Amboina); id., *Mant. Ins.* p. 11. n. 95 (1787); Jabl. & Herbst, *Naturs. Ins., Schmett.* 4. p. 49. n. 147. t. 61. f. 1. 2 (1790) (Amboina); Gmel., *Syst. Nat.* V. 1. p. 2240. n. 324 (1790) (Amboina); Fabr., *Ent. Syst.* III. 2. p. 70. n. 218 (1793) (Amboina).

♀. *Papilio Eques Achirus nissus* Cramer, l.c. II. pp. 85, 150. t. 150. f. A. B (1778) (Amboina); Goeze, l.c. p. 87. n. 67 (1779); Fabr., *Spec. Ins.* II. p. 21. n. 84 (1781) (Amboina); id., *Mant. Ins.* p. 11. n. 96 (1787); Jabl. & Herbst, l.c. p. 51. n. 148. t. 61. f. 3. 4 (1790) (Amboina); Gmel., l.c. n. 325 (1790) (Amboina); Fabr., *Ent. Syst.* III. 1. p. 70. n. 219 (1793) (Amboina).

♂. *Papilio Eques Achirus jasius*, Fabricius, *Syst. Ent.* p. 449. sub n. 29 (1775) (pt.; queried Seba's fig.); Goeze, l.c. p. 51 sub n. 26 (1779) (pt.).

♂ ♀. *Nymphalis nissus*, Godart, *Enc. Méth.* IX. p. 357. n. 23 (1819) (Amboina; *sub synonym*, "nissus" Herbst, "euryalus" Herbst!).

*Eriboea euralia* (!), Hübner, *Verz. bek. Schm.* p. 47. n. 435 (1816-27).

*Nymphalis nissus*, Lucas, *Lep. Exot.* p. 120. t. 63 ♂ (1835) (Amboina).

*Charaxes nissus*, Thon, *Naturg. Schmett.* p. 74. t. 37. f. 545. 546 (1837) (Amboina).

*Nymphalis euryalus* (!), Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 25 (1850) (Amboina); Kirby, *Cat. Diurn. Lep.* p. 270. n. 34 (1871) (Amboina); Pagenst., *Jahrb. Nass. Ver. Nat.* XLI. p. 93. n. 63 (1888) (Amboina); id., *Abh. Senkenb. Naturf. Ges.* XXIII. p. 403. n. 184 (1897) (Ulyasser).

*Charaxes euralus*, Butler, *Cat. Diurn. Lep. descr. by Fabr.* p. 50. n. 3 (1869) (Amboina).

*Charaxes euryalus* (!), Staudinger, *Exot. Tagf.* p. 171. t. 50. ♀ (1886) (Amboina; Ceram); Ribbe, *Iris* II. p. 239. n. 78 (1890) (Ceram, rare); Röber, *Tijdschr. v. Ent.* XXXIV. p. 308 (1891) (Ceram); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 399. n. 144 (1896) (Amboina).

*Charaxes euryalus* (!) Cr. ♀ nov. aberr. *abruptus* Frubstorfer, *Soc. Ent.* XII. p. 178 (1898) (Amboina).

♂ ♀. Head, pronotum and anterior part of mesonotum dark chestnut, rest of *upperside* olivaceous black, with a slight chocolate tint. *Underside* chestnut, palpi

and middle of pro- and of anterior portion of mesosternum buff, middle of abdomen ochraceous buff; middle and hinder legs: femora black, with white scaling, tibiae and tarsi dark clay colour.

♂. *Wings above* purplish black, with a slight brown tint.—Forewing: with an oblique series of postdiscal, tawny ochraceous, patches of variable size from  $SC^5$  to internal margin, last spot buff colour, a spot before  $SC^5$  sometimes vestigial; or these spots all absent, but occasionally the last one or two indicated.—Hindwing: postdiscal interspaces filled up by pale blue patches which are fused with the creamy white or yellowish admarginal interspaces to a broad band, which is divided by the thin black veins and includes the black postdisco-submarginal, rounded spots with bluish white centres, proximal edge of band convex between veins, blue scaling  $C-SC^2$  obsolete in most individuals, admarginal black line continuous, heavy.

*Underside* chestnut, the glossy parts somewhat olivaceous, bars heavy, rather variable in size and position, mostly edged with greenish olive, but if the interspaces between the bars are pale ochre yellow, the respective bars are edged with white; submedian interspaces of fore- and hindwing partly pale ochre yellow in some specimens.—Forewing: discal interspaces sometimes with pale yellow patches at the outer side of the median bars; discal bars halfmoon-shaped, postdiscal ones also luniform but much less conspicuous, the postdiscal interspaces (between these bars) pale yellow, this colour mostly extended between  $M^2$  and  $SM^2$  to near edge of wing, including two black spots, the upper yellow postdiscal interspaces sometimes obsolete; white submarginal scaling forming small patches between veins.—Hindwing: discal and postdiscal black luniform bars strongly arched, the postdiscal halfmoon-shaped interspaces bright chestnut, mostly somewhat yellowish at discal bars; postdisco-submarginal, glossy grey, patches  $SC^2-M^2$  about equal in size, except patch  $R^3-M^1$  which is larger, patch  $C-SC^2$  very small; submarginal bars, which form the outer portions of these patches, black; white submarginal dots within patches all present; admarginal interspaces pale ochre yellow, the upper four larger than the glossy grey postdisco-submarginal patches; admarginal line continuous, blackish chestnut; upper tail,  $5\frac{1}{2}$  to 8 mm. long, second a short tooth.

♀. *Wings above*.—Forewing: postdiscal pale ochre yellow patches very large, the band of patches either complete, often with the discal interspaces  $SC^4-R^3$  also pale ochre yellow, or incomplete, the band extending from internal margin to  $M^2$  and then fading away.—Hindwing as in ♂, but the postdisco-submarginal black patches much larger, the blue postdiscal interspaces only partly joined along veins to the pale admarginal ones.

*Underside* nearly as in ♂, except that the submedian, discal and postdiscal interspaces are more extended yellow, hence the underside appearing more variegated; median bars of forewing closer to the discal ones than in most ♂, bars  $R^3-M^1$  sometimes touching one another; upper tail broad,  $6\frac{1}{2}$  to 9 mm. long, second a blunt tooth.

Length of forewing: ♂, 42–52 mm.

„ „ ♀, 55–65 mm.

According to the development of the band on the forewing above one can separate the individuals into two groups the names of which are:

*a. Ch. eurialus* ab. *eurialus* (syn.: *abruptus* Fruhst., l.c.).

Band absent or only marked behind in ♂, abbreviated in front in ♀.

*b. Ch. eurialus ab. nisus.*

Band more or less complete in both sexes.

Penis irregularly dentate above near the tip, the series turning lateral proximally and ending in a patch of heavy teeth situated on the right-hand side about 3 mm. from the apex ; penis-funnel long, slender, nearly as in *Ch. marmas*.

*Hab.* Amboina and Ceram. In the Tring Museum 11 ♂♂, 11 ♀♀. Amboina : W. Doherty, February 1892.

*b<sup>1</sup>.* Median bar  $SC^4-SC^5$  of forewing below much more distal than bars  $SC^5-R^2$ .

22. *Charaxes varanes*.

Seba, *Thesaur.* IV. p. 43. t. 35. f. 13. 14 (1764).

*Papilio Eques Achirus varanes* Cramer, *Pap. Exot.* II. p. 100. and 151. t. 160. f. D. E (1777) (Amboina and Coromandel ! ! ) ; Goeze, *Ent. Beytr.* III. 2. p. 87. n. 69 (1779) ; Fabr., *Spec. Ins.* II. p. 14. n. 55 (1781) (India ! ) ; Stoll, in Cramer, *Pap. Exot.* IV. p. 202. t. 388. f. A. B (1782) (Amboina ! ) ; Fabr., *Mant. Ins.* II. p. 7. n. 61 (1787) ; Jabl. & Hbst., *Naturs. Schmetz.* IV. p. 22. n. 133. t. 56. f. 3. 4. 5 (1790) (India ! ) ; Gmel., *Syst. Nat.* I. 5. p. 2236. n. 309 (1790) (India ! ) .

*Nymphalis Nymphalis varanes*, Fabricius, *Ent. Syst.* III. 1. p. 66. n. 206 (1793) (India ! ) .

*Coca varanessa* (!), Hübner, *Verz. bek. Schmetz.* p. 48. n. 442 (1816-27).

*Nymphalis veranes* (!), Godart, *Enc. Méth.* IX. p. 364. n. 48 (1823) (Caffraria).

*Phyllophasis veranes* (!), Blanchard, *Hist. Ins.* III. p. 448. n. 2 (1840) (pt.).

*Philognoma varanes*, Westwood, in Doubl. & Hew., *Gen. Diurn. Lep.* p. 311. n. 2 (1850).

*Palla varanes*, Kirby, *Cat. Diurn. Lep.* p. 274. n. 3 (1871) (pt.).

*Charaxes varanes*, Butler, *Proc. Zool. Soc. Lond.* p. 176 (1881) ; Auriv., *Kon. Sc. Vet. Akad. Handl.* XXXI. 5. p. 241. n. 56 (1899) (pt.).

♂♀. *Upperside* of body white ; head, pronotum and anterior edge of mesonotum ochraceous buff, often shaded with grey, head with two white dots behind, often also with two pale buff dots before, the antennae ; palpi above more or less black ; antennae rufous brown or rufous, scaling of inner two-thirds of dorsal and lateral surface black, of outer third white. *Underside* buff yellow, abdomen cream colour.

♂. *Wings above*, proximal area white, shading into pale ochreous or orange tawny on forewing, distal area bright chestnut tawny.—Forewing : costal margin rather strongly curved, outer margin distinctly concave ; cell-bars often vestigial, especially bar 3 ; bar D thin, cleft costally ; no submedian bars ; median bar  $SC^4-SC^5$  8 to 10 mm. from cell, often fused with the discal band of patch-like bars, median bars  $SC^5-R^2$  2 to 3 mm. nearer the cell, heavier, bar  $R^2-R^3$  1 to 2 mm. from cross-vein, often touching bar D, sometimes completely fused with it, bar  $R^3-M^1$  somewhat oblique, seldom at right angles to  $M^1$ , often angle-shaped or resembling number 3, with the ends pointing basad, 3 to 4 mm. from base of  $M^1$ , bar  $M^1-M^2$  thinner, sometimes abbreviated behind, or vestigial, also oblique, 7 to 8 mm. from base of  $M^2$ , often resembling number 3, with the ends pointing basad, bar  $M^2-SM^1$  seldom present (in 8 out of 112 specimens), short ; discal bars enlarged to patches, fused with the postdiscal, submarginal and admarginal bars to a disco-marginal area, which includes a series of postdiscal and a series of submarginal ochraceous spots, basal edge of the area triangularly convex between the veins from  $R^2$  to  $M^2$ , often produced to median bar  $R^3-M^1$ , and, between  $R^2$  and  $R^1$ , to median bar  $R^1-R^2$  ; postdiscal interstitial spots  $SC^5-M^2$  more or less ovate, spots  $R^1-R^3$  smaller than the others, no spot, or only a vestige of one, before  $SC^5$ ,



more distal than spot  $SC^5-R^1$ , spots  $M^2-SM^2$  small, the last often vestigial or absent, the series about parallel to outer margin, but spot  $SC^5-R^1$  more proximal ; submarginal series of interstitial spots almost exactly parallel to margin, smaller than postdiscal spots, spot  $SC^4-SC^5$  more often present than absent, all subtriangular, if large, basally convex or straight, distally rounded ; postdiscal bars in most specimens deeper brown than the rest of the outer area, rounded ; fringe white at internervular folds.—Hindwing: the white area concave between C and  $R^2$ , then gently convex, reaching abdominal margin about 4 mm. from tip of  $SM^2$ , slightly bluish distally, crossing  $R^3$  at or before its bent; about midway between white area and margin of wing there is a series of postdisco-submarginal, blackish brown, patches, with the centres less dark, situated between C and  $M^1$ , mostly followed by a small spot behind  $M^4$ , the patches variable in size and distinctness ; a series of admarginal, blackish brown, lunules, the posterior ones generally more or less obviously edged with glaucous blue distally, admarginal interspaces more or less tawny ochraceous between veins ; fringe restricted-white at internervular folds.

*Underside* : varying in the tint of the ground colour, generally ochreous proximally, more clayish ochraceous distally, but often all clayish ochraceous, clouded all over with black scales, apex of cell of forewing, outer area of both wings, especially at discal line, and abdominal area of hindwing more or less glossy ; bars thin, those in basal half very irregular in shape, brownish black, without black borders, but on hindwing sometimes glossy.—Forewing : cell without basal spot, cell-bar 2 arched, ends pointing basad resp. upper end costad, bar 3 interrupted, bar 4 very irregular, but not very variable, its middle portion more distal and bidentate ; bar D very thin, vein  $D^1$  varying in length : two submedian bars  $M^1-(SM^1)$ , continuous, or nearly so, bar  $M^1-M^2$  concave basally, closer to base of  $M^2$  than to that of  $M^1$  ; median bars  $M^1-(SM^1)$  2 to 3 mm. distant from submedian bars, bar  $M^1-M^2$  angle-shaped, the angle pointing basad, 1 to 2 mm. from base of  $M^1$ , median bar  $R^3-M^1$  more oblique, 0 to  $1\frac{1}{2}$  mm. from bar D, bar  $R^2-R^3$  about 1 to 2 mm. from bar D, bars  $SC^5-R^2$  generally not continuous, 5 or 6 mm. from apex of cell, bar  $SC^4-SC^5$  2 or 3 mm. more distal ; discal bars fused to a rather heavy continuous line, or narrow band, beginning at costal margin 25 mm. from apex, forming a rounded angle between  $R^1$  and  $R^2$ , where it is about 11 mm. distant from outer margin, and being parallel to outer margin from  $R^3$  to internal edge of wing, the line often bordered distally with clayish grey, somewhat silvery scaling ; a series of black or blackish postdiscal patches or dots, the posterior ones often obsolete, all placed in circular buff patches, which are often quite indistinct ; between discal line and postdiscal patches there is often an indistinct brown line.—Hindwing : basal costal bar arched, pointing distad, not reaching C ; costal subbasal bar absent, subbasal bar C— $SC^2$  absent, or represented by a small dot in angle between C and  $SC^2$ , subbasal cell-bar concave basally, followed by a short bar M— $(SM^1)$  or M— $SM^2$ , which is often more distal, subbasal bar  $SM^2-SM^3$  more distal again, its upper end pointing distad and often reaching the upper end of the respective submedian bar ; submedian series of bars also not quite continuous, that within cell forming two angles which point distad ; costal median bar more proximal than median bar C— $SC^2$ , the upper part of the latter more distal than the posterior part, bars  $SC^2-R^3$  gradually a little more distal, bar  $R^2-R^3$  touching  $R^3$  close to its origin, bar  $M^1-M^2$  before origin of  $M^1$ , bar  $M^2-(SM^1)$  1 or 2 mm. more distal, often joined to submedian bar  $M^2-(SM^1)$  along  $(SM^1)$ , median bar  $(SM^1)-SM^2$  often joined to respective submedian bar in a similar way ; discal bars fused to a heavy line or narrow band as on

forewing, the line straight, crossing  $R^3$  2 to 3 mm. from its origin, beginning at costal margin 8 to 10 mm. from tip of C and reaching abdominal margin close to anal angle, barely  $\frac{3}{4}$  mm. broad; a postdisco-submarginal series of pale ochraceous rings, parallel to outer margin, bordered proximally with chestnut tawny; within the rings are the blackish postdiscal bars, of which bars  $SC^2-M^1$  are absent or represented by dots, and the submarginal bars represented by dots, central parts of rings occupied by white scaling, which is conspicuous in rings  $M^1-SM^2$ ; a series of indistinct pale ochraceous lunules often between discal line and postdisco-submarginal rings; black admarginal lunules short, but distinctly transverse, if not obsolete, bordered white distally, especially the posterior ones, with pale ochraceous half-moons at proximal side, which halfmoons often touch between veins the pale ochraceous postdisco-submarginal rings, often reducing the interspaces to diamond-shaped patches; tail  $R^3$  broad, of even width, or slightly spatulate, about 6 to 8 mm. long, tail  $M^2$  represented by a blunt angle.

♀. Larger than ♂, white basal area of forewing above more extended, *underside* occasionally pale olive, with a greenish tint; tail longer, and broader at tip.

Length of forewing: ♂, 36—45 mm.

„ „ ♀, 39—50 mm.

Penis much thinner than in all the preceding species: one tooth of variable size about 1 mm. from end, followed proximally by a few more very small ones: penis-funnel slenderer than in *marmax*, its upperside convex at tip: clasper (Pl. 8. f. 24.) rather slender, the apical hook broad, concave on the upperside.

*Hab.* Africa south of the Sahara, from Senegambia and Abyssinia to the Cape Colony.

Cramer's figure in *Pap. Exot.* II. represents undoubtedly this species, but is not exact enough to enable us to say which of the forms described below the figure must be referred to. Cramer gives Amboina and Coromandel as locality!

*Ch. varanes* varies considerably, especially on the underside; while the individuals from South Africa are different on the upperside from the remainder of the species, and, therefore, are kept subspecifically separate in this monograph, the specimens from tropical East and West Africa do not seem to us to have developed into an Eastern and a Western race. But *Ch. varanes* from the East Coast is by no means the same as *Ch. varanes* from the western forest region. On the former country the underside presents similar variation, as does the underside of the South African race, there being three forms distinguishable: one with the wings irrorated with clouds of black scales, a second without this irroration and with the bars clearly marked, and a third with the ground of wing deeper in tint and the bars accordingly fainter: the second and third forms run into one another. In West Africa only the second form occurs.

The trichromatism in the South and East African *Ch. varanes*, which is best marked in the individuals from Cape Colony and Natal, may be the outcome of seasonal changes in the environment, the one extreme form looking more like a withered leaf, the other extreme more like a fresh leaf; but the data at our disposal are not sufficient to allow us to express an opinion on the question, whether those three forms, or at least the most different ones, are confined to certain seasons, or whether the differences in the individuals mean simply individual variability independent of the season of the year. It will be difficult to settle the question without careful observations on the spot, as even material with exact data, day of capture, locality, altitude, will not tell us much if it does not comprise a long series of

specimens from the same place from all times of the year. The climate in East Africa is often locally so different, that individuals caught on the same day, but a few miles apart, may have passed the chrysalis state under very different climatical conditions. The few dated specimens we have in the Tring Museum are recorded below.

The larva and chrysalis of the South African subspecies are described by Trimen (see below).

*a. Ch. varanes austrinus* Rothsch., subsp. nov.

(?) *Papilio Eques Achirus varanes* Stoll, in Cramer, *Pap. Ecot.* IV. p. 202. t. 388. f. A.B (1782) (Amboina!).

*Nymphalis ceranes* (!), Godart, *Enc. Méth.* IX. p. 364. n. 48 (1823) (*syn. pro p.*; Caffraria); Lucas, *Lep. Es.* p. 123. t. 65. f. 1 (1835) (Caffraria).

*Philognama varanes*, Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 311. n. 2 (1850) (pt.; Caffraria); Trim., *Rhop. Afr. Austr.* p. 181. n. 105 (1862—66) (*syn. pro p.*; Knysna; Natal; Pt. Elizabeth; King Williamstown; Grahamstown).

*Palla varanes*, Staudinger, *Ecot. Tagf.* p. 174. t. 60 (1886) (pt.; Natal).

*Charaxes varanes*, Trimen & Bowker, *S. Afr. Butt.* I. p. 321. n. 105 (1887) (pt.); Butl., *Journ. Linn Soc. Lond.* XXV. p. 400. n. 149 (1896) (pt.); Dist., *Ann. Mag. N. H.* (7). I. p. 51 (1898) (Barberton); Auriv., *Kongl. Sc. Akad. Handl.* XXXI. 5. p. 241. n. 56 (1899) (pt.).

*Charaxes fulvescens*, Karsch (non Aurivillius, 1891), *Berl. Ent. Zeitschr.* XXXVIII. p. 192. n. 57 (1893) (*sub synonym.*); Auriv., *Ent. Tidskr.* XV. p. 312. n. 202 (1894) (*sub synonym.*).

♂ ♀. White colour of base of forewing reduced to a small patch at internal margin which seldom extends to M<sup>2</sup>, distally never extending to discal tawny chestnut patches; on hindwing the white area does not quite reach the bent of vein R<sup>3</sup>. Three forms according to coloration of underside:—

*a*<sup>1</sup>.

♀ ♂. Underside russet or pale tawny olive in ♂, clay colour or greenish olive in ♀ (*type* of subspecies, from Natal), apex of cell of forewing and outer marginal area of both wings conspicuously glossy; veins prominently green; discal line heavy, bordered with greyish white outwardly, bars in basal half feebly marked, partly absent, markings in outer region also partly obliterate or vestigial.

This form is common enough in Natal; we possess, however, only one specimen from there with date (Durban, March). A second dated specimen (♀) from Zululand, Makuri Hill, was caught in May; it has the forewing more extended white than our Natal specimens have, but agrees in the greenish olive tint of the underside with a number of ♀ ♀ from that country.

*b*<sup>1</sup>.

♂. Underside pale clayish ochreous in basal half, bars prominent, ocelli of hindwing all well marked, as are the other markings of the marginal area.

Some specimens of the *male* sex only from Natal, without date of capture.

*c*<sup>1</sup>.

♂ ♀. Underside irregularly irrorated all over with black scaling, apex of cell of forewing devoid of black scales (or almost so), bars generally rather heavy, as are the postdiscal spots of forewing and ocellate patches of hindwing, ♀ paler in ground colour than ♂, less tawny.

A series of individuals of both sexes from Natal and Cape Colony; no dates.

*Hab.* Cape Colony: Natal; Zululand; Transvaal.

The larva and pupa are described by Mr. Trimen, *l.c.*, as follows:—

“Larva.—Dull bluish-green above; pale whitish-green beneath, irrorated with very minute silvery dots. On the sixth, eighth, and tenth segments, a pale-ochreous, somewhat crescentic, mark on the back,—that on the tenth segment very



faint and only found in full-grown specimens. A thin, sinuated, silvery lateral stripe. Head flat, armed with four backward-sloping, recurved, somewhat serrated horns, bright turquoise-blue beneath, and in young specimens edged with reddish. Anal segment flattened, bifid. Feeds on a species of *Rhus* (probably *R. laevigata*).

"Pupa.—Pellucid blue-green with a delicate plum-like bloom. On each side of abdomen a row of six black dots. On anal pedicel two pairs of small yellowish tubercles, and a similar pair on ventral surface, close to pedicel, facing towards the head."

Mr. Trimen continues to say:—"This very fine butterfly is common in the wooded parts of South Africa, and is very conspicuous on the wing. At rest, it is by no means easy to detect, its undersurface colouring being so like faded or withered leaves, and its accustomed seat being on the stems or among the branches. Its flight is not so rapid as that of several of its near allies, and it often descends to sport about low trees and even bushes. The exuding sap from wounds of trees is very attractive to it; and I once enticed a specimen by honey smeared on a trunk at Plettenberg Bay. The species seems to be out during every month of the year, but is numerous only during the warmer season.

"The South African examples differ from those I have examined from different parts of Tropical Africa in having the basal white of the forewing so much restricted. They are, however, variable in this particular, some females exhibiting a small inner-marginal white patch, extending as far as median nervure; but none that I have seen present nearly so much white as is found in specimens from Cape Coast Castle and Sierra Leone on the West Coast, or Quilimane and Zambesi on the East Coast, in which, in both sexes, the white largely invades the discoidal cell and in the ♀ nearly fills it. In the hindwing, also, the white in the Tropical examples is extended to a point considerably nearer anal angle."

### b. *Ch. varanes vologeses*.

*Phlognoma varanes*, Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* p. 311. n. 2 (1850) (pt.; Sierra Leone: Ashanti); Butl., *Cat. Diurn. Lep. descr. by Fabr.* p. 50. n. 3 (1869) (S. Leone); Plötz, *Stett. Ent. Zeit.* XLI. p. 194. n. 107 (1880) (Victoria, Camer., VI. VIII.); Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 125. n. 63 (1889) (Kassai); Smith, *Proc. Zool. Soc. Lond.* p. 472. n. 90 (1890) (Aruwimi); Godm. & Salv., in Jameson, *Story of Rear Column* p. 441. n. 90 (1890) (Congo); Hamps., *Am. Mag. N. H.* (6). VII. p. 181 (1891) (Sabaki R.); Sharpe, *Proc. Zool. Soc. Lond.* p. 341. n. 47 (1894).

*Palla vologeses* Mabille, *Bull. Soc. Zool. France* I. p. 280 (1876) (Congo; Landana).

*Palla varanes* Kirby, *Cat. Diurn. Lep.* p. 274. n. 3 (1871) (pt.); Staud., *Exot. Tagf.* p. 174 (1886) (pt.); Butl., *Ann. Mag. N. H.* (6). VII. p. 42. n. 13 (1891) (E. Afr.); Auriv., *Ent. Tidskr.* XII. p. 216. n. 148 (1891) (pt.; Cameroons, Gaboon); Holl., *Proc. N. S. Nat. Mus.* XVI. p. 571 (1893) (Freetown); Butl., *Proc. Zool. Soc. Lond.* p. 650. n. 26 (1893) (Lake Mweri; Zomba, January); id., *l.c.* p. 562. n. 18 (1894) (Brit. E. Afr.); Reb. & Rogenb., in Baumann, *Mossailand zur Nilquelle* p. 332. n. 95 (1894) (Mwansa; Ufioni); Holl., *l.c.* XVIII. p. 262 (1895) (E. Afr.); Lanz, *Iris* IX. p. 143 (1896) (Parumbira, Oct.).

*Charaxes varanes*, Trimen & Bowker, *S. Afr. Butt.* I. p. 321. n. 105 (1887) (pt.); Trim., *Proc. Zool. Soc. Lond.* p. 39. n. 59 (1894) (Manica, Mimeni); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 400. n. 149 (1896) (pt.); id., *Ann. Mag. N. H.* (6). XVIII. p. 69. n. 7 (1896) (Nyassa); id., *Proc. Zool. Soc. Lond.* p. 256. n. 21 (1898) (Zomba); id., *l.c.* p. 397. n. 11 (1898) (Brit. C. Afr.); Auriv., *Kongl. Sv. Vet. Akad. Handl.* XXXI. 5. p. 241. n. 56 (1899) (pt.).

*Palla (Charaxes) varanes*, Schaus & Clements, *Sierra Leone Lep.* p. 9 (1893) (S. Leone).

♂ ♀. White area of forewing *above* occupying at least half the cell, extending beyond M<sup>2</sup> and coming posteriorly near the chocolate tawny outer area or touching



it; in ♀ the cell is often all white; on hindwing the white area reaches the bent of R<sup>3</sup>.

On the whole the West African specimens have the outer half of the upperside a little deeper in tint than the East African individuals.

Three forms in East Africa, one of them only in West Africa.

*d*<sup>1</sup>.

♂ ♀. Underside clayish tawny, the bars feebly marked, partly obsolete, discal line heavy, markings in outer region feeble, except ocellate patches C—SC<sup>2</sup> and M<sup>1</sup>—SM<sup>2</sup>; gloss in outer region prominent. The underside is apparently never olive as in certain South African specimens.

Common in East Africa. In the Tring Museum from Port Alice, Uganda, July 3rd and 19th, 1894 (Dr. Ansorge); Kibwezi, Brit. E. Afr., April 7th, 1894 (Dr. Ansorge); Dar-es-Salaam, Germ. E. Afr.; Delagoa Bay; Zomba, October—December 1895 (Dr. Rendall).

*e*<sup>1</sup>.

♂ ♀. Underside paler, bars prominent, markings in marginal area better defined.

The difference between form *e*<sup>1</sup> and *d*<sup>1</sup> is not so marked as in the case of the corresponding forms of *Ch. varanes austrinus*.

In the Tring Museum from Parumbira, Lake Nyassa, October 23rd and 24th, 1894 (Dr. Ansorge); Delagoa Bay; Chipaika Estate, near Bandawa, Nyassaland (Watkinson); Ft. Johnstone, January—February 1896 (Dr. Rendall); Dar-es-Salaam, Germ. E. Afr.; Mikindani, Germ. E. Afr., January—May 1897 (Reimer); Mombasa, Brit. E. Afr.; Mazera's, Brit. E. Afr., March 12th, 1895 (Dr. Ansorge); Pabo, Unyoro, July 24th, 1897 (Dr. Ansorge); Hoima, Unyoro, August 12th, 1897 (Dr. Ansorge); Salomona, Eritrea, November—December 1897 (Schrader); Bogos, Abyssinia (Hansal); and all over West Africa from Senegambia to Angola.

*f*<sup>1</sup>.

♂ ♀. Underside irrorated with black scaling.

In the Tring Museum from Masindi, Unyoro, April 14th, 1897 (Dr. Ansorge); Mombasa; Mikindani, January—May 1897 (Reimer); Dar-es-Salaam; Delagoa Bay; Chipaika Estate, near Bandawe, Nyassaland (Watkinson).

### 23. *Charaxes fulvescens*.

*Papilio Nymphalis Gemmatus varanes*, Drury (non Cramer, 1777), *Illustr. Ex. Ins.* III. p. 42 and Index (1782) (S. Leone).

*Nymphalis veranes* (!), Godart, *Enc. Méth.* IX. p. 364. n. 48 (1823) (pt.).

*Phyllophasia veranes*, Blanchard, *Hist. Nat. Ins.* III. p. 348. n. 2 (1840) (pt.).

*Philognoma veranes*, Westwood in Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 311. n. 2 (1850) (pt.).

*Palla varanes*, Kirby, *Cat. Diurn. Lepid.* p. 274. n. 3 (1871) (pt.); Mab., *Bull. Soc. Zool. France* I. p. 280 (W. Afr.).

*Palla varanes* var. *fulvescens* Aurivillius, *Ent. Tidskr.* XII. p. 216. sub n. 148 (1891) ("type" Drury's fig.).

♂ ♀. Differs from *Ch. varanes* as follows:

*Wings, upperside*: basal area buffish maize yellow, not milky white, on hindwing creamy white at base and in abdominal fold; outer area darker than in *varanes*, blackish chestnut on forewing at costal and outer margins.—*Forewing*: apex more rounded, outer margin less concave; median bars more distal than in *varanes*,

bar  $R^3$ — $M^1$  6 to  $7\frac{1}{2}$  mm. from base of  $M^1$ , bar  $R^2$ — $R^3$   $1\frac{2}{3}$  to  $2\frac{1}{2}$  mm. from cross-vein  $D^3$ , never touching bar  $D$ , which is obsolete behind; discal patches  $R^3$ — $SM^2$  tawny chestnut, much paler than the postdiscal patches and the marginal area; postdiscal yellowish buff interstitial spots smaller than in *varanes*, spot  $SC^4$ — $SC^5$  often present, double spot  $M^2$ — $SM^2$  often obsolete; submarginal interstitial spots also smaller, often minute, seldom nearly all absent, extreme outer edge tawny, fringe not distinctly white between veins, though there are occasionally a very few white scales at the internervular folds on the underside.—Hindwing: the creamy basal area posteriorly less extended than the white area of *varanes*, and also less well defined, gradually shading into the outer area; discal line of underside showing through, anteriorly generally marked by tawny scaling; postdisco-submarginal round patches nearly black, variable in size, seldom with a white dot inside; brownish black admarginal bars larger than in *varanes*, less arched, the upper four larger than the last three, margin outside these bars and tail distinctly paler than admarginal area, creamy at upper angle; tail not spatulate, broader at base than in *varanes*, hence margin more oblique from tail to anal angle, tooth at  $M^2$  generally less obvious than in *varanes*.

*Underside*: ground colour pale straw yellow, much shaded with clay colour; bars black, thin, prominent on account of the pale ground colour, with a thin, glossy, whitish border in side-light; discal line less black, more dark clay colour.—Forewing: discal line more sharply angled before  $R^2$  than in *varanes*, and more concave behind, its costal part often broken up into spots; in most specimens the postdiscal spots represented by sharply marked dots; median bars  $R^3$ — $SM^2$  in *varanes* at about equal distance from discal line, in *fulvescens* bar  $R^3$ — $M^1$  farther away from the line than bars  $M^2$ — $SM^2$ .—Hindwing: proximal border of ocellate postdisco-submarginal spots not chestnut, but tawny olive, black ring of upper ocellus heavy, sharply marked also distally, submarginal black bars of ocelli  $SC^2$ — $M^1$  generally represented by a tiny, but conspicuous, black dot, central parts of ocelli  $M^1$ —( $SM^1$ ) all white, not shaded with ochraceous; admarginal black spots much smaller than in *varanes*, but sharper defined, more obvious, with or without tiny white spots at distal side which are never distinctly transverse as in *varanes*; fringe with dispersed white scales, especially behind tail; no white spots at internervular folds.

Length of forewing: ♂, 39—48 mm.

      "      "      ♀, 48—54 mm.

Penis and penis-funnel as in *Ch. varanes*: clasper constantly different; the apical tooth thinner, more curved, its upper surface less concave (Pl. 8. f. 25.).

Larva and chrysalis unknown, most likely not essentially different from those of *Ch. varanes*.

*Hab.* West African Forest Region, from Sierra Leone to Angola and Uganda.

*Ch. fulvescens* is constantly different in the characters of the wings and claspers from *varanes*, and there are no intergradations. The two insects occur together in the same place at the same time of the year, as our material proves; hence *varanes* and *fulvescens* can neither be geographical nor seasonal varieties. Against there being forms of a dimorphic species tell the following facts: (1) that two insects are distinguished by differences in the claspers of the ♂♂; (2) that the differences presented by the wings are found in both sexes, without there being any intergradations between the two insects; (3) that *fulvescens* does not occur in East Africa proper, though *varanes* of West and East Africa are not subspecifically separable.

We do not see any reason for the assumption that *fulvescens* is a variety of *varanes*; everything points to its being independent of it.

We recognise two geographical races, which are connected by intergradations occurring in the intermediate countries.

**a. Ch. fulvescens fulvescens.**

*Papilio Nymphalis Gemmatus varanes* Drury, l.c. (Sierra Leone).

*Palla varanes* var. *fulvescens* Aurivillius, l.c.

*Charaxes fulvescens*, Karsch, Berl. Ent. Zeitschr. XXXVIII. p. 192. n. 57 (1893) (*syn. pro p.*; Adeli, Togo); Auriv., l.c. XV. p. 312. n. 202 (1894) (Bonge, Cameroons, Nov., Dec.).

*Charaxes nigrescens* Butler, Journ. Linn. Soc. Lond. XXV. p. 401. n. 150 (1896) (Sierra Leone; Gold Coast; Ashanti).

*Charaxes varanes* var. ? (ab. 1) *nigrescens*, Aurivillius, Kongl. Sv. Vet. Akad. Handl. XXXI. 5. p. 241. n. 56 (1899).

*Charaxes varanes* var. (temp. ?) (ab. ?) *fulvescens*, id., l.c. (1899) (pt.).

♂ ♀. *Wings above*.—Forewing: pale basal area reaching to origin of M<sup>2</sup> or beyond, shading distally into orange ochraceous; postdiscal and submarginal interstitial spots orange ochraceous.—Hindwing: basal area whitish cream-colour behind, gradually shading into the outer area.

*Underside*: ground colour very pale straw yellow in basal area.

*Hab.* Sierra Leone to Gaboon. In the Tring Museum from: Sierra Leone, 5 ♂♂, 1 ♀; Gold Coast, Accra, 33 ♂♂, 4 ♀♀; Agawasso, middle of July 1897. 4 ♂♂; Warri, Niger Coast Protectorate, caught in March, April, May, June, August, and September (Dr. Roth), 9 ♂♂, 4 ♀♀; Cameroons, 2 ♂♂.

Individuals from Gaboon and the Cameroons approach the next subspecies.

**b. Ch. fulvescens monitor** Rothsch., subsp. nov.

*Charaxes fulvescens*, Butler, Journ. Linn. Soc. Lond. XXV. p. 401. n. 151 (1896) (pt.; Congo).

*Charaxes varanes* var. (temp. 1) (ab. ?) *fulvescens*, Aurivillius, Kongl. Sv. Akad. Handl. XXXI. 5. p. 241. n. 56 (1899) (pt.; Congo).

♂ ♀. *Wings above*.—Forewing: basal area not quite so pale as in *nigrescens*, shading on disc into tawny orange ochraceous; postdiscal and submarginal interstitial spots more tawny than in *fulvescens*.—Hindwing: basal area more white, better defined, posteriorly more restricted, the outer area darker, especially in anal region; black admarginal spots large.

*Underside* more clay colour than in *fulvescens*, in ♀ with a greenish olive tint.

*Hab.* Congo: Upoto (Rev. Oram), 3 ♂♂, Kassai country, 2 ♂♂. Fajao, Unyoro, July 11th (*type*!) and 16th, 1897 (Dr. Ausorge), 2 ♂♂, 1 ♀; Monyonyo, Unyoro, March 18th, 1897 (Dr. Ausorge), 1 ♂; Pt. Alice, Unyoro, March 3rd, 1894, and July 3rd, 1897 (Dr. Ausorge), 2 ♂♂; Mtebe, Uganda, July 30th, 1894 (Dr. Ausorge), 1 ♀; Kampala, Uganda, March 21st, 1897 (Dr. Ausorge), 1 ♀.

The specimen from Monyonyo has a distinct white dot in the first black postdisco-submarginal patch of the upperside of the hindwing, and traces of such dots also in the other spots.

**24. Charaxes balfouri** (Nov. Zool. VII. t. 11. f. 3, ♂).

*Charaxes balfouri* Butler, Proc. Zool. Soc. Lond. p. 176. t. 18. f. 6 ♀ (1881) (Socotra); id., Journ. Linn. Soc. Lond. XXV. p. 400. n. 148 (1896) (Socotra); Auriv., Kongl. Sv. Akad. Handl. XXXI. 5. p. 241. n. 55 (1899) (Socotra).

♂ ♀. Body above chestnut-hazel, antennae the same colour, paler at ends, their scales also chestnut except those on outer surface, which are white; *underside* clayish creamy buff.

♂. *Wings above* : basal area hazel-chestnut, gradually shading into the reddish chestnut outer area, which has a maroon purple tint, especially on hindwing.—Forewing : similar in markings to *Ch. varanes*, but postdiscal spots rather smaller, hence the series of postdiscal and submarginal interstitial spots closer together, these series of spots either of nearly the same colour as the base of the wing, or tawny ochraceous ; outer edge scalloped ; fringe white except at ends of veins.—Hindwing : of the postdisco-submarginal series of brownish black spots of *Ch. varanes* only the upper two are marked, small, the others vestigial or absent ; two white submarginal dots between  $M^2$  and  $SM^2$  more or less conspicuous ; black admarginal lunules large ; interspaces between them and fringe bluish white ; fringe buff ; edge of wing conspicuously scalloped.

*Underside* bistre brown, bars in shape and position similar to those of *Ch. varanes*.—Forewing : bar D complete, with a white proximal border which gradually fades away proximally ; discal line as strongly angled as in *Ch. fulvescens*, slightly concave between  $R^2$  and  $M^1$ , then somewhat convex, with a heavy white outer border from  $SC^3$  to ( $SM^1$ ), the white scaling occupying the whole area between discal line and postdiscal dots, but gradually sparser distally.—Hindwing : discal line convex, very slightly broken at some of the veins, two upper partitions somewhat concave, with a heavy white outer border which is sharply limited between C and  $SC^2$  and again between  $M^1$  and  $SM^2$ , while between  $SC^2$  and  $M^1$  it is much broader and gradually fades away, the postdiscal-marginal area thinly shaded with white scaling ; eye-spot C— $SC^2$  sharply marked, composed of a white centre surrounded by three rings ; blackish brown, bistre, dark chestnut, eye-spots  $SC^2$ — $M^1$  vestigial, the centres of spots  $M^1$ — $SM^2$  white, transverse, the proximal portions of the wings of these latter spots marked or obsolete, the distal portions obsolete ; black admarginal spots heavy, but widely separate, with heavy, transverse, white outer borders ; edge of wing buff and fringe white, except at extremities of veins ; tail of even width, not distinctly spatulate, narrower than in *Ch. varanes*, 6 to 7 mm. long, tooth  $M^2$  prominent.

♀. Similar to ♂, ground colour paler, the reddish chestnut colour of the upperside less extended.

Length of forewing : ♂, 36—40 mm.

“ “ ♀, 42—45 mm.

Sexual organs similar to those of *Ch. fulvescens* and *varanes*, clasper resembling more that of *fulvescens*.

*Hab.* Socotra. In the Tring Museum 3 ♂♂, collected by O. Grant at 1500 and 3000 ft., January 22nd and 24th and February 7th.

*b.* Discal line of hindwing below deeply biconcave, a sharply defined, pale buff, postdisco-submarginal ring C— $SC^2$ .

## 25. *Charaxes analava* (Nov. Zool. VII. t. 11. f. 1, ♂).

*Charaxes analava* Ward, *Entom.* IX. p. 3 (1872) (Madagascar) ; Mab., in Grandid., *Hist. Mad.* XIX. 2. *Lep.* I. p. 194. t. 25a. f. 2. 2a (1885) (Madagascar) ; Butt., *Journ. Linn. Soc. Lond.* XXV. p. 369. n. 47 (1896) (Antananarivo) ; Auriv., *Kongl. Sv. Akad. Handl.* XXXI. 5. p. 241. n. 54 (1899) (Madagascar).

♂. Body *above* cream colour, head, collar, and anterior part of mesonotum ochraceous buff, seldom smoky brown, palpi without black dorso-lateral stripe, antennae green, with creamy scales ; *underside* cream colour, or creamy buff, breast



with buff or black oblique stripes underneath legs, sides of metasternum same colour as the stripes, upperside of femora also buff or black.

♂. *Wings above*: Naples yellow, changing into buff yellow in anal region of hindwing.—Forewing: outer area from apex of cell to margin black, this area narrowing posteriorly, about 8 to 10 mm. broad at  $SM^2$ , its inner margin convex between veins, no separate submedian and median bars, basal area mostly a little extended distad beyond lower angle of cell, but lower end of bar D then obsolete or very thin; the black area includes, as in *Ch. candiope*, a series of postdiscal interstitial spots of the same colour as the basal area, spot  $SC^4-SC^5$  absent, the next one about 2 to 3 mm. in length, spots  $R^1-R^3$  minute, especially the upper of the two, spots  $R^3-M^2$  larger than the others, diameter about  $2\frac{1}{2}$  to  $3\frac{1}{2}$  mm., spots  $M^2-SM^2$  small, close together at ( $SM^2$ ), mostly fused to one spot; outer edge of wing concave, scalloped, marginal dots small; discal interspaces  $SC^5-R^2$  somewhat closer to cell than in *Ch. candiope*, varying in width,  $\frac{1}{4}$  to  $\frac{1}{2}$  as wide as the black area between them and apex of cell.—Hindwing: postdisco-marginal black band from C to  $R^3$ , continued behind by dispersed black scales and the slightly curved admarginal bars  $R^3-M^2$  and the two dots near anal angle, the band stopping in front at C, but its outer portion sometimes extended to costal margin; the band consists of the postdisco-submarginal eye-spots, the admarginal bars, and the interspaces between, the latter often less deep black than the eye-spots and bars; the eye-spots  $R^3-M^2$  often vestigial, upper three marginal buff lunules well separated, posterior ones less so, because here the ends of the veins are not deep black, but clayish, shaded with few black scales; outer edge deeply scalloped, anal angle not triangularly produced, while the outer margin is more produced at  $R^3$  than usually, hence the wing somewhat pentagonal, with three tails.

*Underside*: veins green; greenish olive cinnamon from base to irregular discal line, darker near the latter, much variegated with white; black bars thin, but sharply defined in basal two thirds.—Forewing: base of costal margin white, cell with three black bars, first short, bordered with white basally, second before middle, reduced to a short streak behind SC which is placed into a straight, heavy, white bar, third bar thin, complete, straight, faintly irregular, oblique, reaching M at or before base of  $M^1$ , mostly nearly parallel to bar D, apex of cell all white; submedian bar  $M^1-M^2$  present; median bars  $SC^3-M^2$  conspicuous on the dark ground on account of their white proximal borders, bar  $M^1-M^2$  2 to 3 mm. from base of  $M^1$ , slightly incurved, bar  $R^3-M^1$  oblique, posteriorly more distal than the bar behind it, anteriorly touching lower angle of cell, bar  $R^2-R^3$  in front of it, bars  $SC^3-R^2$  6 mm. from cell, a little nearer to the cell than to the discal line, at right angles to veins, or slightly inclining basad; interspaces between median bars  $R^3-M^2$  and cell respectively submedian bar  $M^1-M^2$  buff cinnamon; discal bars fused to a continuous line which begins at costal margin 12 to 14 mm. from apex, is strongly convex behind  $R^1$ , then irregularly concave down to beyond  $M^2$ , the posterior portion more distal, slightly oblique, straight, reaching  $SM^2$  4 to 5 mm. from tip of this vein, distally this line is bordered white (except beyond  $M^2$ ), the white colour shading into the cinnamon buff postdisco-marginal area; postdiscal bars represented by a series of minute dots, spot  $SC^4-SC^5$  only being larger, ovate, all surrounded by some grey scaling, internal marginal area from base to near discal line, and anteriorly to M resp.  $M^2$ , creamy.—Hindwing: basal costal bar absent, or very short, placed along the basal branch of PC, no costal subbasal bar, subbasal bar C- $SC^2$  also often absent, subbasal bars  $SC^2-SM^3$  continuous, heavily bordered white basally,

posteriorly approaching, or joining, submedian bar  $SM^2$ — $SM^3$ , this latter much more basal than the other submedian bars, anteriorly joined to median bar ( $SM^1$ )— $SM^3$  by means of an irregular longitudinal line, the interspace limited by these median and submedian bars as well as the cellule beyond  $SM^3$  and part of the area between median and discal bars ( $SM^1$ )— $SM^2$  even drab; median bars continuous down to ( $SM^1$ ), the line crossing M at, or a little distal of, base of  $M^2$ , regularly convex; costal median bar variable in position, always more basal than the other median bars, which are almost continuous to ( $SM^1$ ), this line convex in middle, nearly parallel to submedian line, interspaces between the two lines white proximally, cinnamon buff distally; discal bars all continuous representing a very irregular line, which forms nearly a half-ring between costal margin and internervular fold  $R^1$ — $R^2$ , then runs obliquely distad to beyond  $R^2$ , turns sharply back, forming a concave curve down to beyond  $M^2$ , where it forms a right angle ending at  $SM^2$  about 5 mm. from anal angle; at  $R^1$  the line comes close to the median one; distally the line is broadly bordered with white, which colour is very much extended between  $SC^2$  and  $R^1$ ; post-discal and submarginal bars not sharply defined, brown, the former distally, the latter proximally bordered with creamy buff, curved towards each other, the upper ones meeting to form rings, the rings filled up with brown and grey scaling, ring C— $SC^2$  very conspicuous on account of its heavy tawny outer border and its regular shape; irregular ring-spots  $R^1$ — $R^3$  and the anal ones the smallest, spot  $R^3$ — $M^1$ , which is the least well-defined, the largest; submarginal area and outer margin cinnamon, varying in shade, admarginal bars thin, transverse, slightly curved, bordered with white proximally and with whitish blue distally; tail  $R^3$  8 to 12 mm., rather broad, not pointed, generally slightly turned backwards, tail  $M^1$  5 to 8 mm. long, straight, slightly pointed, tail  $M^2$  7 to 10 mm. long, somewhat curving frontad, slightly pointed.

♀. Not essentially different from ♂.

Clasper not essentially different from that of *Ch. varanes*; penis-funnel much shorter, and broader apically, than in that species; penis with one solitary tooth about  $1\frac{1}{3}$  mm. before apex.

Length of forewing: ♂, 38—47 mm.

“ “ ♀, 46—50 mm.

*Hab.* Madagascar, in forest country. In the Tring Museum, 7 ♂♂.

B. Forewing below with single rows of scales before C.

## 26. *Charaxes candiope*.

*Nymphalis candiope* Godart, *Enc. Méth.* IX. p. 353. n. 10 (1813) (hab.?).

*Charaxes viridicostatus* Aurivillius, *Ofvers. Vet. Akad. Förh.* XXXVI. 7. p. 41 (1879) (Damaraland).

♂♀. *Body above*: varying from tawny to ochraceous, head, pronotum, and anterior part of mesonotum deeper in tint than rest of upperside, dots on head and pronotum vestigial or absent, palpi with a black dorso-lateral stripe; *underside* creamy buff, sides of breast slightly tawny.

♂. *Wings*: veins (and membrane) green; *upperside* tawny or orange tawny, basal area slightly paler or pale ochre yellow.—Forewing rather falcate; three cell-bars vestigial, bar 3 mostly black at SC; submedian and median bars  $M^1$ — $M^2$  showing through from below, or the median one clearly marked behind  $M^1$ , median bars  $SC^4$ — $M^1$  present, bar  $R^3$ — $M^1$  halfmoon-shaped, occasionally nearly extending to base of  $M^1$ , bar  $R^2$ — $R^3$  often fused with bar D, which latter is dilated in front,

bars  $SC^4-R^2$  more distal, dilated, each more or less convex proximally, concave distally, often joined to bar D as well as to discal bar  $R^2-R^3$ , in which case the interspaces are more or less isolated and reduced in size ; a complete series of black discal patches, representing the discal bars, the series parallel to outer margin, but turning costad at  $R^1$ , the patches contiguous, each convex proximally, concave distally, patch  $R^1-R^2$  the smallest, all joined along veins (except  $(SM^1)$ ) to the postdisco-submarginal band, thus isolating a series of seven tawny ochreous, post-discal, interstitial spots, of which the posterior ones are the largest ; edge of wing blackish brown, the admarginal interspaces pale tawny, but not always clearly marked ; the postdisco-submarginal black band widest in front ; the discal and postdiscal interspaces in the St. Thomé race small or only vestigial.—Hindwing : basal to discal bars more or less showing through from underside ; a postdisco-submarginal black band, widest between  $SC^2$  and  $R^1$  (at least 9 mm.), suddenly narrower from  $R^2$  or  $R^3$  to  $M^2$ , often interrupted at vein  $M^1$ , including a series of tawny ochreous, seldom whitish, submarginal interstitial spots, which stand either in the middle of the band or nearer its outer edge ; postdiscal bars  $M^2-SM^2$  thin, curved, followed each by a white line, between which and the respective submarginal bars, which are represented by two spots, there is more or less obvious pale blue scaling ; admarginal interspaces tawny, upper ones more orange tawny, seldom suffused with black, anal one olive buff, no distinct marginal line.

*Underside* : the naked veins and costal edge of forewing conspicuously green ; bars black.—Forewing : buff or clayish buff, slightly ochreous ; basal half of costal edge before C with rows of white scales, otherwise scaleless ; basal cell-spot present, bars linear, bar 3 the heaviest, about  $\frac{2}{3}$  mm. thick, its upper end a little hook-shaped, that of bar 4 more strongly so ; submedian and median bars  $M^2-SM^2$  seldom vestigial at  $M^2$ , bars  $M^1-M^2$  parallel, thin, at right angles to veins, about  $2\frac{1}{2}$  mm. distant from each other, submedian one (seldom absent) behind base of  $M^1$  or a little more distal ; median bar  $R^3-M^1$  more distal than the one behind it, bar  $R^2-R^3$  separate from bar D, but the interspace between them brownish, bars  $SC^3-R^1$  forming a continuous or a broken line ; discal bars concave distally, the series continuous, convex from  $SC^3$  to  $R^3$ , then running obliquely to  $SM^2$  which is reached 6 mm. from tip, while at  $R^3$  the series is 10 mm. distant from outer margin, posterior bars heavier than the upper ones, the discal bars form the outer edge of a band of nearly even width, the band varies from walnut brown to russet, changes posteriorly generally into blackish brown, its upper two thirds are occasionally cinnamon or almost obsolete ; a series of brown postdiscal spots, parallel to discal series of lunules, approaching it a little behind, distance between the two series about 4 or 5 mm., spot  $SC^4-SC^6$  developed to a patch, last spot large, fused with the submarginal bar ; series of thin, inconspicuous, submarginal bars parallel to outer margin, submarginal interspaces buffish grey, more bluish grey behind, a bluish grey dash or spot within black patch  $M^2-SM^2$ .—Hindwing : sepia colour or russet sepia, submarginal area drab ; bars thin, basal costal bar pointing distad, no costal subbasal bar, the subbasal series extending from C to  $SM^3$  ; submedian series irregular but continuous from costal margin to M, with creamy white scaling at proximal side, which scaling forms generally a conspicuous spot before and another in cell, submedian bar  $M^1-M^2$ , if present, close to base of  $M^2$ , bar  $M^2-(SM^1)$  distal of base of  $M^2$ , about at right angles to veins, while bar  $(SM^1)-SM^2$  is oblique and often joins the respective subbasal bar at  $SM^2$ , bar  $SM^2-SM^3$  does not extend to  $SM^2$ , it curves basad anteriorly and joins the respective subbasal one, forming a kind



of half ring, which sometimes is filled up with whitish scaling; median series irregular, oblique down to  $R^2$ , slightly concave, bars  $R^2-M^1$  more distal than the others,  $R^3-M^1$  about  $1\frac{1}{2}$  mm. from base of  $M^1$ , bar  $M^1-M^2$  just behind base of  $M^1$ ,  $M^2-(SM^1)$  about 3 mm. more distal, at right angles to  $M^2$ ,  $(SM^1)-SM^3$  again more distal, reaching abdominal margin beyond tip of  $SM^3$ , the median bars (except last) with creamy white scaling at outer side, this scaling forming an irregular band from costal margin to  $R^2$ , followed by three spots, bar  $M^2-(SM^1)$  edged with creamy white; discal bars arched, especially upper two, the series concave from C to  $R^3$ , bar  $SC^2-R^1$  the most proximal, standing in or before the middle of the wing, oblique from  $R^3$  to  $M^2$  or to abdominal margin, the bars edged distally with ochraceous or greenish ochraceous lunules; postdiscal bars arched like the discal ones, the postdiscal interspaces therefore halfmoon-shaped, the upper ones generally wider than the posterior ones, varying in tint from raw umber to burnt umber, white submarginal spots in the same position as above, posterior ones curved, black submarginal bars represented by black dots to which are joined proximally bluish dots, uppermost black dot generally absent, all placed in buff or olive buff scaling; upper admarginal interspaces pale buff; marginal line posteriorly burnt umber colour; upper tail slender, more or less pointed, second longer, of even width, often slightly spatulate.

♀. Larger than ♂, basal area of both wings, *above*, postdiscal interstitial spots of the forewing and the submarginal ones of the hindwing paler; tails longer than in ♂, broader.

Length of forewing: ♂, 39—46 mm.

“ “ ♀, 44—52 mm.

Apical process of clasper broad, narrowed into a sharp, rather short, hook; tenth tergite divided by a rounded sinus; penis with a dorsal series of teeth, varying in size and number, the teeth closer together near apex.

*Hab.* Africa south of the Sahara (Cape Colony excepted); St. Thomé; Socotra.

*a. Ch. candiope candiope.*

*Nymphalis candiope* Godart. *Enc. Méth.* IX. p. 353. n. 10 (1823) (hab. ?) : Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 16 (1850) (Congo); Kirby, *Cat. Diurn. Lep.* p. 268. n. 17 (1871) (Congo).

*Charaxes candiope*, Butler, *Proc. Zool. Soc. Lond.* p. 628, n. 18 (1865) (Congo); Druce, *ibid.* p. 412. n. 5 (1879) (Angola); Oberth., *Ann. Mus. Cr. Genova* XV. p. 166. n. 45 (1879) (Abyssinia; June, July); Gooch, *Entom.* XIV. p. 6 (1881) (Natal); Spiller, *ibid.* XV. p. 8 (1882) (Natal); Stand., *Erot. Tugf.* p. 169. t. 58. ♂ (1886); Trin. & Bok., *S. Afr. Butt.* I. p. 327. n. 107. t. 6. f. 4. ♂ (1887) (from Natal northwards); Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 146. n. 77 (1889) (Si-Baugh, Gabon); Smith, *Proc. Zool. Soc. Lond.* p. 472. n. 85 (1890) (Aruwimi); Godm. & Salv., in Gibson, *Story of Rear Column* p. 440. n. 87 (1890) (Aruwimi); Trim., *Proc. Zool. Soc. Lond.* p. 180. n. 33 (1892) (Omroira VIII.; Ehanda IX.); Karsch, *Ent. Nachr.* xviii. p. 176. n. 44 (1892) (Baliburg); Schaus & Clements, *Sierra Leone Lep.* p. 8 (1893) (S. Leone); Auriv., *Ent. Tidskr.* XV. p. 310. n. 190 (1894) (Cameroons, iv. v.); Butl., *Proc. Zool. Soc. Lond.* p. 562. n. 17 (1894) (Mt. Hübnel, 16,000 ft.); HOLL., *Proc. N. St. Nat. Mus.* XVI. p. 262 (1895) (Somaliland); Butl., *l.c.* p. 254. n. 13 (1895) (Zomba); id., *l.c.* p. 725. n. 13 (1895) (*Brit. E. A.*); id., *l.c.* p. 852. n. 17 (1896) (Nyassaland); Sharpe, *ibid.* p. 553. n. 33 (1896) (Darro Mts., Somaliland); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 367. n. 44 (1896) (Many local. noted); Auriv., *Kongl. Sv. Akad. Hand.* XXXI. 5. p. 240. n. 51 (1899) (from Sierra Leone and Abyssinia to Damaraland and Natal).

*Charaxes viridicostatus* Aurivillius, Öfvers. Vet. Akad. Förh. XXXVI. 7. p. 41 (1879) (Damaraland).

♂. *Body above*: clayish ochraceous, wings orange tawny, base ochre yellow.—  
*Forewing*: bar D and median bars SC<sup>1</sup>—M<sup>1</sup> very variable in size, median bars



$R^1-M^1$  often obsolete, bars  $SC^1-R^2$  not joined to bar D, bar  $R^3-M^1$  generally smaller than the ochreous or tawny orange triangle bordered by it and veins  $M^1$  and  $R^3$ ; black discal patch  $R^1-R^2$  about the size of the orange tawny patch at its proximal side, or smaller; postdiscal, tawny orange, interstitial spots very variable, sometimes larger than the black discal patches.—Hindwing: submarginal interstitial spots orange tawny, upper four or five situated nearer the outer than the inner edge of the black band; admarginal interspaces orange tawny, anal one olive buff.

*Underside*.—Forewing: basal area pale buff; cell-bar 4 thin, nearer to apex of cell than to bar 3; median bars  $SC^3-R^2$  oblique to the veins; brown discal band 3 to 4 mm. broad between  $R^3$  and  $M^1$ , the band often very pale.—Hindwing: discal lunule  $SC^2-R^1$  nearer to base than to outer margin or just in middle of wing; distance between median and discal bars  $R^2-R^3$  varying from  $1\frac{1}{2}$  to 4 mm. at  $R^2$ , postdiscal interspaces  $C-M^1$  of nearly equal width or the upper three much wider, the distance from the proximal edge of discal bar  $SC^2-R^1$  to the outer edge of the respective postdiscal bars varying from  $2\frac{1}{2}$  to  $4\frac{1}{2}$  mm.; marginal line pale, ill-defined; upper tail  $3\frac{1}{2}$  to  $6\frac{1}{2}$  mm., second 7 to  $9\frac{1}{2}$  mm. long.

♀. Paler than ♂, especially basal area, median bars of forewing *above* larger, bar  $R^1-R^2$  often joined to bar D as well as to discal patch  $R^1-R^2$ ; upper tail 8 to  $10\frac{1}{2}$  mm. long, second 9 to  $10\frac{1}{2}$  mm.

The bars of the *underside* are often partly indistinct, the wings not appearing so strongly variegated as in other individuals, the white band on the disc of the hindwing being also absent. Such specimens occur especially often in S. E. Africa, and are most likely individuals which have hibernated in the pupal state, representing a cold season form.

Length of forewing: ♂, 40—46 mm.

” ” ♀, 46—52 mm.

*Hab.* Continent of Africa from Sierra Leone and Abyssinia to Natal and Damaraland; not found in the Cape Colony; a common species. Antinori observed it feeding on the exudations of Solanaceous plants (Oberthür, *Ann. Mus. Civ. Genova* XV. p. 166). According to Mr. Morant the species is on the wing during the greater part of the year in Natal (Trimen & Bowker, *l.c.*).

#### b. *Ch. candiope thomasius* (Nov. Zool. V. t. 7. f. 5. ♂).

*Charaxes candiope* var. *thomasius* Staudinger, *Exot. Tagf.* p. 169 (1886) (St. Thomé); Auriv., *Kong. Vet. Akad. Handl.* XXXI. 5. p. 241. sub n. 51 (1899) (St. Thomé).

*Charaxes candiope* local race? : *C. thomasius*, Butler, *Journ. Linn. Soc. Lond.* XXV. p. 368. sub n. 45 (1896) (St. Thomé).

♂. *Wings above*, basal area ochre yellow, the area on forewing sharply defined, on hindwing shading into russet tawny.—Forewing: bar D heavy, fused with median bar  $R^2-R^3$ , median bar  $R^2-M^1$  visible, bar  $M^1-M^2$  short, vestigial, outer area of wing blackish mummy brown, the tawny postdiscal interstitial spots small, posterior ones obsolete, as are the admarginal spots.—Hindwing: disco-marginal blackish mummy brown area very broad in front, the submarginal dots within it minute, admarginal tawny interspaces obsolete, except two upper ones.

*Underside*.—Forewing: basal area very pale ochreous; submedian bar  $M^1-M^2$  absent (always?); cell-bars as in continental *candiope*, apical interspace

of cell narrower than the postmedian one; median bars  $SC^3-R^2$  closer to cell than to discal bars; brown discal band 4 to 5 mm. wide between  $R^2$  and  $M^1$ ; series of brown postdiscal spots  $SC^5-M^1$  parallel to outer margin.—Hindwing as in *candiope candiope*, brown marginal line better defined, black submarginal spots partly dash-like, longitudinal.

♀. Unknown.

Length of forewing: ♂, 42 mm.

*Hab.* Island of St. Thomé (St. Thomas) in the Gulf of Guinea (coll. Staudinger).

*c. Ch. candiope velox* (Nov. Zool. VII. t. 11. f. 3. ♂).

*Charaxes velox* Grant, *Bull. Liverpool Mus.* II. p. 10 (1900) (Socotra, up to 4000 ft.).

♂ ♀. *Wings above* and body tawny, basal area of wings a little paler.—Forewing: median bar  $R^3-M^1$  halfmoon-shaped, touching both veins, bars  $SC^1-R^2$  twice as long as broad.—Hindwing: submarginal interstitial spots in middle of black disco-submarginal band, outer edge of this band somewhat dentate between the veins; admarginal interspaces  $R^2-M^2$  partly, anal one totally, scaled olive-buff.

*Underside*.—Forewing: postmedian interspace of cell paler than the rest of the cell, whitish, a little, or not, broader than the apical interspace of cell; submedian bar  $M^1-M^2$  proximal of base of  $M^1$ ; median bars  $SC^3-R^2$  forming a curved line, bar  $SC^5-R^1$  at right angles to veins; black patch  $M^2-SM^2$  in posterior angle about half the size of the respective postdiscal interspace.—Hindwing: discal and submarginal interspaces grey or drab; discal and postdiscal, luniform, bars parallel, the series of nearly equal distance from C to  $M^1$ , the interspaces between them greenish ochraceous, discal bar  $SC^2-R^1$  in the middle of the wing, 6 mm. distant from base of  $R^1$ , measured between veins, discal bar  $R^2-R^3$  2 mm. distant from median bar  $R^2-R^3$ , measured along  $R^2$ , the halfmoon formed by the discal and postdiscal bars  $M^2-SM^2$  less oblique than in continental *candiope*; edge of wings dentate, upper tail pointed and long in ♂, 6 to 7 mm. long, second 7 to  $8\frac{1}{2}$  mm.; in ♀ tails 10 mm.

Length of forewing: ♂, 39–41 mm.

” ” ♀, 44 mm.

*Hab.* Socotra; 4 ♂♂, 2 ♀♀, collected by O. Grant in January and February 1899, at 1200 and 3500 ft.

27. *Charaxes antamboulou* (Nov. Zool. VII. t. 11. f. 2. ♂).

*Charaxes antamboulou* Lucas, *Ann. Sc. Nat. Zool.* (5). XV. 22. p. 1 (1872) (Madagascar); Saalm., *Lep. Mad.* I. p. 86. n. 125. t. 2. f. 24. 25 (1884) (Nossibé); Mab., in Grandid., *Hist. Mad., Lép.* I. p. 191. t. 23. f. 3. 4. ♀ (1885–87) (pt.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 368. n. 45 (1896) (Ft. Dauphin; Ankafana); Auriv., *Kongl. Sv. Akad. Handl.* XXXI. 5. p. 241. n. 52 (1899) (Madagascar).

*Charaxes candiope*, Ward (non Godart, 1823), *Ent. Mo. Mag.* IX. p. 210 (1873) (Madagascar); Saalm., *Ber. Senk. Ges.* p. 82. n. 29 (1878) (Loucoubé).

*Charaxes candiope* var., Saalmüller, *l.c.* p. 123 (1879).

♂ ♀. *Body above* tawny ochraceous, thorax paler, palpi with a black dorso-lateral line; *underside* cream colour, sides of sterna russet, femora black, with white, dispersed scales, abdomen clay colour.

♂. *Wings above*, similar to those of *Ch. candiope*; basal area pale ochreous veins partly green; hindwing tawny posteriorly and along black postdisco-

submarginal band.—Forewing : falcate, outer edge not, or very little, dentate at the veins, middle cell-bar represented at SC by a black or brown spot ; bar D sometimes separate, mostly with a small ochreous dot distally at upper end, seldom completely fused with median bars ; median bar  $M^1-M^2$  seldom obviously vestigial, the other median bars of *Ch. candiope* merged together with the black discomarginal area, this area including a series of postdiscal interstitial spots as in *Ch. candiope*, the spots, however, smaller, and some discal spots, namely, a band composed of three confluent spots between  $SC^4$  and  $R^2$ , and two contiguous spots  $R^2-M^1$ , admarginal interspaces and outer half of costal margin tawny.—Hindwing : moderately dentate, two tails ; interstitial spots within black postdiscosubmarginal band smaller than in *Ch. candiope*, tawny colour along this band very much restricted from C to  $R^2$ .

Underside as in *Ch. candiope*, brighter russet, the white borders of the bars rather more conspicuous.—Forewing : cell-bar 3 closer to bar 2 than to 4, interspace between 2 and 3 bright russet, basal cell-bar rather long, conspicuous, upper end of cell-bar 4 at right angles to SC, or pointing proximad ; median bars  $SC^3-R^2$  at right angles to veins ; interspaces between median bars  $SC^3-M^1$  and cell russet, median bar  $M^1-M^2$  touching at ends the discal, russet, band-like, area ; submedian bar  $M^1-M^2$  proximal of base of  $M^1$  ; submedian and median bars  $M^2-(SM^1)$  seldom vestigial behind  $M^2$ , the former 1 or 2 mm. distant from base of  $M^2$ , discal series of curved bars less concave in middle than in *candiope*.—Hindwing : median bar  $R^2-R^3$  more gently curved than in *candiope* ; discal luniform bar  $SC^2-R^1$  in middle of wing ; upper, tawny russet, postdiscal halfmoon-shaped patches wider than the middle ones, last halfmoon less obliquely placed to vein  $M^2$  than in *Ch. candiope candiope* ; submedian bar  $M^2-(SM^1)$  a little more proximal than in *candiope* ; upper tail 6 to 8 mm., second 9 to 10 mm. long.

♀ like ♂ ; underside more greyish, especially in submarginal region, discal interspaces of hindwing more white ; upper tail 9 mm., second 10 mm.

There occur specimens of either sex which have the forewing more falcate and the underside much less variegated, the bars being partly obsolete. Such a specimen is figured by Mabille, *l.c.*, t. 23. f. 4 ; in the Tring Museum there is a ♂ and a ♀ of this form, which specimens have bar D and bars  $SC^4-R^3$  of forewing, most of the bars of the hindwing as well as the white discal spots and the upper postdiscal, half-moon-shaped, patches obsolete. It is possible that these specimens represent the cold season form.

Length of forewing : ♂, 38–41 mm.

” ” ♂, 41–47 mm.

*Hab.* Madagascar : Nossi-bé, Ft. Danphin, Ankafana, Morondawa. In the Tring Museum 9 ♂♂, 4 ♀♀, mostly from Morondawa.

*Ch. antamboulou* is very closely allied to *Ch. candiope*. We keep it separate as a distinct species, because there is another *Charaxes* in Madagascar, named *cowani*, which is also a close ally of *candiope*, and differs from *antamboulou* only in some details. We know little about the distribution and nothing about the time of occurrence of *Ch. antamboulou* and *cowani* ; these forms may be mere individual varieties ; but before we have sufficient evidence to warrant such a conclusion, it is better to treat the two forms as distinct species. In Saalmüller's figure the hindwing is nearly as strongly denticulate as it is in *cowani* ; if that is not due to exaggeration on the part of the artist, the example figured would prove that the strong denticulation of the wings of *cowani* is not of specific value.

28. *Charaxes cowani* (Nov. Zool. VII. t. 11. f. 4. ♂).

*Charaxes cowani* Butler, *Ann. Mag. N. H.* (5). II. p. 285 (1878) (Fianarantsoa); id., *l.c.* (5). V p. 336 (1880) (♀, Fianarantsoa); Saalm., *Lep. Mad.* I. p. 83. n. 126 (1884) (Fianarantsoa); Butl., *Proc. Zool. Soc. Lond.* p. 72. sub n. 89 (1888) (*covani* and *antamboulou* distinct); id., *Journ. Linn. Soc. Lond.* XXV. p. 368. n. 46 (1896) (Fianarantsoa; Betsileo); Auriv., *Kongl. Sc. Akad. Handl.* XXXI. 5. p. 241. n. 53 (1899) (Madagascar).

*Charaxes antamboulou* Mabille, in Grandid., *Hist. Mad.* XIX. 2., *Lép.* I. p. 191. t. 23. f. 1. 1a (1885-87) (pt.; *covani* = *antamboulou*!).

*Charaxes covani* Staudinger, *Exot. Taf.* p. 169 (1886) (Madagascar).

♂. Body *above*, and basal area of wings, tawny ochraceous, darker than in *antamboulou*.—Forewing: discal interspaces  $SC^4$ — $R^3$  reduced in size, partly obsolete, tawny like the postdiscal interstitial spots, no interstitial spot between  $R^3$  and  $M^1$ , or only a trace of it, black area posteriorly wider; edge of wing dentate.—Hindwing: black area also broader than in *antamboulou*, edge of wing strongly dentate, tooth  $M^2$  developed to a tail; blue submarginal dots  $R^1$ — $SM^2$  generally rather conspicuous.

*Underside*: darker than in *antamboulou*, the buffish interspaces, especially of forewing, reduced in size.—Forewing: cell-bar 3 a little more distal than in *antamboulou*, apical interspace of cell russet, not buff, submedian and median bars  $M^1$ — $M^2$  much closer together than in the allied species, black discal patch  $M^2$ — $SM^2$  more oblique, postdiscal bars represented by small, but rather sharply marked, dots; submedian and median bars  $M^2$ —( $SM^1$ ) represented by spots behind  $M^2$ .—Hindwing: blue and black submarginal dots conspicuous, but small; subbasal and submedian bars ( $SM^1$ )— $SM^3$  absent; postdiscal series of half-moon-shaped spots a little less curved than in *antamboulou*, tooth  $R^2$  2 mm. long, tail  $R^3$  10 mm., tail  $M^1$  3 to 4 mm., tail  $M^2$  10 to 11 mm.

♀. Body and basal area of wings *above* as in *antamboulou*, outer margin of both wing and posterior portion of disc of hindwing very dark tawny brown.—Forewing: median bar  $R^3$ — $M^1$  without tawny spot at outside, completely fused together with the black outer area; tawny interspaces at distal side of median bars  $R^3$ — $M^1$  vestigial.—Hindwing: submarginal, buff, spots rather heavy.

*Underside* somewhat paler than in ♂, submedian and median bars  $M^1$ — $M^2$  of forewing not quite so close together, dentition of wings as in ♂, tail  $R^3$  11 mm., tail  $M^1$  4 mm., tail  $M^2$  12 mm. long.

*Hab.* Madagascar: Betsileo; Fianarantsoa. In the Tring Museum 2 ♂♂, 1 ♀ without precise locality.

II. Underside, series of subbasal bars of hindwing stopping at M, or abdominal fold streaked.

C. Serrations of costal margin of forewing in basal third about half the number of the scale-rows before vein C.

c. Discal bars of fore- and hindwing regularly arched, postdiscal ones of hindwing also concave distally, about parallel to discal ones.

c'. Median bars  $SC^3$ — $R^2$  of forewing below close to cell, if present.

c''. Median bars of hindwing below continuous, forming an almost straight line, which is conspicuously bordered with white distally.



29. *Charaxes numenes* (Nov. Zool. VII. t. 7. f. 3, ♂).

*Nymphalis numenes* Hewitson, *Erot. Butt.* II. *Nymphalis* t. 2. f. 9. 10. 11. ♂, ♀ (1859) (S. Leone); Kirby, *Cut. Diurn. Lep.* p. 269. n. 27 (1871) (S. Leone); Mabille, *Bull. Soc. Zool. France* I. p. 280 (1876) (Landana); Dewitz, *Nov. Act. Kais. Leop. Car. Ak. Naturf.* XLI. II. 2. p. 8 (1879). *Charaxes numenes*, Butler, *Proc. Zool. Soc. Lond.* p. 630. n. 29 (1865) (S. Leone); Plötz, *Stett. Ent. Zeit.* XLI. p. 194. n. 104 (1880) (Eninga, May; Victoria, Nov.); Staud., *Erot. Tugf.* p. 170 (1886) (Monrovia; Fernando Po; Gaboon); Dewitz, *l.c.* L. 4. p. 371 (1887); Godm. & Salv., in Jameson, *Story Rear Column* p. 440. n. 83 (1890) (Aruwimi); Möschl., *Abh. Senkenb. Gesellsch.* XV. 1. p. 61. n. 100 (1890) (Aburi); Auriv., *Ent. Tidskr.* XV. p. 311. n. 192 (1894) (Ekundu, Bonde, XI.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 377. n. 76 (1896) (S. Leone, Accra; O. Calabar; Cameroons; Fernando Po; Angola); Auriv., *Kongl. Sr. Akad. Handl.* XXXI. 5. p. 240. n. 45 (1899) (Sierra Leone to Angola).

♂ ♀. Body (♂) *above* black, somewhat bluish, dark mummy brown in front, dots on head and pronotum white, (♀) wood brown or cinnamon; *underside*, palpi buff, mostly with the vestige of a white lateral line, abdomen of ♂ buff, of ♀ clayish buff, breast cinnamon olive.

♂. *Wings above*: blue-black, glossy in basal two-thirds.—Forewing: four pale blue, discal spots, in an oblique row from  $R^1$ — $M^2$ , often preceded by a fifth spot, upper spots generally linear, the others more or less rounded, diameter 1 to  $1\frac{1}{2}$  mm., the series almost straight, spot  $R^3$ — $M^1$  being less distal than in *tiridates*; a series of small postdiscal spots from  $SC^1$  to internal margin, last one or two sometimes absent, first spot the largest, about 1 mm. broad, white, spot  $SC^5$ — $R^1$  also generally white, the others pale blue, middle ones sometimes luniform, the series parallel to outer margin, but curving costad in front, spot  $R^1$ — $R^2$  5 mm. from outer margin; marginal spots pale buff, clearly marked, spots  $R^3$ — $M^2$  more or less luniform.—Hindwing: a postdiscal series of pale blue spots of nearly equal size, spot C— $SC^2$  rounded, the largest, diameter about  $1\frac{1}{2}$  mm., spots  $R^3$ — $M^2$  halfmoon-shaped, spot  $R^2$ — $R^3$  the smallest, the series first concave, spot  $SC^2$ — $R^1$  being 9 to 12 mm. distant from outer margin, then almost straight, spot  $M^2$ —( $SM^1$ ) 5 mm. from outer margin; a complete series of white submarginal dots, edged blue, especially distally; admarginal interstices with triangular, buff, spots near veins, no such spots at C and  $SC^2$ ; fringe white except at the very ends of veins, edge of wing buffish between veins, rather heavily so between C and  $R^1$ ; abdominal fold brownish black, paler at edge.

*Underside*: cell of forewing and submedian interspaces of both wings pale yellowish buff, discal interspaces of forewing at median bars and discal interspaces of hindwing also buffish, median interspaces on both wings and rest of the large triangular discal area of forewing raw umber or bistre colour; white borders of bars conspicuous.—Forewing: basal cell-bar absent, bar 2 heavy, generally over 1 mm. broad, bar 3 separated into two spots, the posterior the largest, the spots sometimes fused to a bar which is constricted before middle, bar 4 thinner, upper half deeply concave, upper end pointing distad, lower half nearly straight, reaching M at or a little below base of  $M^1$ ; bar D very gently curved, sometimes nearly straight; submedian bars  $M^1$ —( $SM^1$ ) very heavy, bar  $M^1$ — $M^2$  a little more distal than bar  $M^2$ —( $SM^1$ ) and also distal of point of origin of  $M^1$ , submedian bar  $R^3$  sometimes marked, situated in angle before  $M^1$ ; median bars  $SC^3$ — $SM^2$  in an oblique series, the series broken at  $R^3$ , bar  $R^3$ — $M^1$ , which is convex distally, being about 2 mm. distant from lower end of bar  $R^2$ — $R^3$ , often also broken at  $M^1$ , bars  $M^1$ — $SM^2$  much heavier than the upper ones, last one often touching discal bar, median interspaces  $M^1$ — $SM^2$  sometimes with black scaling, which often joins the bars together; discal bars  $R^3$ — $SM^2$  evenly curved, black, the other discal bars

more or less obsolete, bars  $M^1$ — $SM^2$  bordered pale blue outwardly ; posterior postdiscal interspaces pale yellow, the others more buffish, upper two with a white spot each ; postdiscal bars  $M^1$ — $SM^2$  represented by heavy black patches which have pale blue, not conspicuous, outer borders, the outer postdiscal spots vestigial, limited distally by pale half-rings ; marginal, yellowish buff or pale clayish, spots ill-defined.—Hindwing : basal costal bar close to PC, touching this vein at bent ; costal subbasal bar seldom marked, subbasal bar C— $SC^2$  often feeble, barely  $\frac{1}{2}$  mm. distal of point of origin of PC ; submedian bars continuous (or nearly so) from costal margin to ( $SM^1$ ), costal bar often curving distad, joining costal bar of median series ; the latter also continuous, somewhat in middle, both series about parallel, distance variable individually, white borders of the lines prominent, while the black bars are often obsolete and always thin, except upper bars ; discal bars all arched, the series deeply concave between C and  $R^2$ , the bars often obsolete, white borders seldom prominent, postdiscal bars halfmoon-shaped, black, middle ones sometimes nearly straight, generally much heavier than the discal ones, but often rather ill-defined ; postdiscal interspaces more yellow than discal and submarginal areas ; interspace C— $SC^2$  as large as, and generally better defined than, interspace  $SC^2$ — $R^1$  ; a series of white submarginal dots, followed by blue and by black ones, except between upper veins ; admarginal interspaces with triangular spots as above, rather paler, shaded with blue upon internervular fold ; tails very short, upper one  $1\frac{1}{2}$  to 2 mm. long, second a mere tooth.

♀. Resembling ♀ of *tiridates* on *upperside*.—Forewing : shorter, white patch between  $M^1$  and  $M^2$  less oblique.—Hindwing : submarginal spots smaller, white, with blue borders ; admarginal interstitial spots interrupted.

*Underside* as in ♂, hence very different from *tiridates* ; white band of forewing as above, patches  $M^2$ — $SM^2$  distally limited by the black postdiscal patches, which are smaller than in ♂, no discal bar  $M^2$ — $SM^2$ , but the yellow interstitial halfmoon vestigial, postdiscal interspaces much less yellow than in *tiridates*.

Length of forewing : ♂, 41—44 mm.

„ „ ♀, 45—51 mm.

Penis with a tooth 1 mm. before tip as in *violetta*, but the large proximal crest reduced to a very low but long ridge, the penis resembling that of *Ch. mixtus* ; penis-funnel as in *violetta*.

*Hab.* West Africa from Sierra Leone to Angola and to the Uganda Protectorate. In the Tring Museum 23 ♂♂, 10 ♀♀ from : Sierra Leone, Pt. Lokkoh, July 1899 (Capt. Stevens) ; Gold Coast ; Congo ; Great Forest of Upper Congo, three days' march from Ft. Beni, 7. v. 1899 (Dr. Ansorge) ; Pt. Alice, Uganda, 19. vii. 1894 (Dr. Ansorge) ; Ran, Nandi country, Uganda Protectorate, 14. iii. 1898 (Dr. Ansorge).

### 30. *Charaxes violetta* (Nov. Zool. VII. t. 7. f. 1. 2, ♂, 8, ♀).

*Charaxes violetta* Smith, *Ent. Mo. Mag.* XXI. p. 247 (1885) (Del. Bay) ; Smith & Kirby, *Rhop. Exot.* I. *Charax.* p. 1. t. 1. f. 1. 2. 3. ♂, ♀ (1887) (Del. Bay) ; Trim. & Bowk., *S. Afr. Butt.* III. p. 385. n. 383 (1889) (Del. Bay.) ; Monteiro, *Delagoa Bay* t. 1. f. 3. (1891) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 376. n. 74 (1896) (Del. Bay ; Zanzibar) ; id., *Proc. Zool. Soc. Lond.* p. 851. (1896) (Nyassaland) ; id., *l.c.* p. 852. n. 14 (1896) (Nyassaland, ♀) ; Auriv., *Kongl. Sr. Akad. Handl.* XXXI. 5. p. 239. n. 40 (1899) (Del. Bay ; Germ. E. Afr. : Bagamoyo, Pangani). *Charaxes siphares*, Holland, *Proc. U. S. Nat. Mus.* XVIII. p. 754 (1896) (Brit. E. Afr.).

♂♀. Body of ♂ as in the allied species ; ♀, *above* olive bistre, abdomen hair brown, white dots on head and collar conspicuous, *underside* wood brown, palpi creamy buff.

♂. *Wings above* : blue-black, glossy, with pale blue and white markings which assume a purplish tint in side-light ; resembling the upperside of *Ch. cithaeron*.—*Forewing* : an oblique discal series of five spots from  $SC^{4.5}$ — $M^2$ , upper two linear, first often absent, last two elongate or subrotundate, never halfmoon-shaped, 3 to 4 mm. long, spot  $R^3$ — $M^1$  very little more distal than spot  $R^2$ — $R^3$  ; a postdiscal series of small, rounded or triangular, dots from  $SC^4$  to  $M^2$ , upper two white, the following two minute, often absent, the series placed as in the allied species : between  $M^2$  and  $SM^2$  there is a large patch composed of the discal and postdiscal spots which are merged together, this patch, which measures 5 to 8 mm. in length, often divided by a deep sinus ; a broad streak behind the patch along internal margin, 8 to 11 mm. long ; minute, whitish or bluish, marginal dots, upper ones, sometimes all, obsolete.—*Hindwing* : a large violet blue area, from C to  $SM^2$ , much shaded with white between abdominal fold and apex of cell, entering cell, often extending basad to middle of cell, partition  $SC^2$ — $R^1$  4 to 11 mm. long, often isolated, sometimes separated into two spots, partition C— $SC^2$  always isolated, mostly divided into two spots, which are sometimes very small, outer edge of area convex as a whole, concave between veins  $R^3$  and  $SM^2$  ; black outer area narrowing posteriorly, constricted at veins, with a series of minute blue dots with white centres ; admarginal interstitial spots concave both sides, blue, white at veins, no such spots between C and  $SC^2$ , of spot  $SC^2$ — $R^1$  only the posterior half marked, occasionally this as well as upper half of spot  $R^1$ — $R^2$  absent.

*Underside* as in *numenes* ; bars of forewing much less heavy, median bars straight, the series less broken at  $R^3$  and much less oblique, being 6 to 8 mm. distant at  $M^2$  from discal bar ; on hindwing the submedian and median lines of bars farther apart, especially at costal margin and at  $M^2$ , the median line less convex in middle, often almost quite straight, discal interspaces rather more shaded with white near median bars than in *numenes* ; submarginal tricolorous spots small, the white proximal and black distal portions closer together ; tails pointed, longer than in *numenes*, upper one 4 to 6 mm. long, second 2 to 3 mm.

♀. *Wings above* : resembling those of *Ch. cithaeron* ; brownish black, slightly purplish, olivaceous at base.—*Forewing* : a broad white band from costal to internal margin, curved, widest behind, about 1 mm. from cross-veins, 10 to 13 mm. broad between  $M^1$  and  $M^2$ , with more or less extended pearl-blue scaling at proximal side of band from  $M^1$  or  $M^2$  to internal margin, white costal streak prolonged basad ; two white postdiscal spots  $SC^4$ — $R^1$ , first oblique, seldom rounded, mostly larger than the second, dots  $R^1$ — $M^1$  often marked ; marginal dots generally absent or vestigial, seldom distinct, though small.—*Hindwing* : a white discal band, tapering behind, about 4 mm. broad in middle, its proximal edge nearly straight, shaded with pearl blue, this bluish white scaling extending over the black basal area to near middle of cell, the band is also distally bordered by purplish pearl-blue scaling, which is variable in extent and generally dentate between veins ; a white postdiscal patch C— $SC^2$  mostly fused with white band ; submarginal white dots small, shaded with pale blue at edges ; admarginal interstitial spots thinner than in ♂, pale blue, whitish at veins, seldom interrupted, but spot C— $SC^2$  absent, upper part of spot  $SC^2$ — $R^1$  also mostly absent, seldom more spots wanting ; fringe white, except at ends of veins.

*Underside* : bars and ground colour as in ♂.—*Forewing* : median bars  $R^3$ — $SM^2$  of forewing a little more oblique, white discal band broader than in *cithaeron*, its inner edge more concave ; black discal lunule  $M^2$ — $SM^2$  vestigial,



sometimes represented only by a few black scales upon (SM<sup>1</sup>); postdiscal dots R<sup>1</sup>—M<sup>2</sup> often well marked and white.—Hindwing: discal interspaces occupied by a white band from costal to abdominal margin, broadest in front or in middle, narrowest at (SM<sup>1</sup>), distally shaded with clayish olive and not sharply defined; discal and postdiscal luniform bars variable as in ♂, seldom nearly all absent, the white distal borders of the discal bars often prominent; upper tail nearly even in width, 5 to 8 mm. long, second 4 to 5 mm.

Length of forewing: ♂, 35—42 mm.

" " ♀, 38—48 mm.

Penis-funnel concave above to the tip, blunt, the tip thickened forming a short hook; penis with one dorsal tooth about 1 mm. before end, and a high triangular ridge about 2 $\frac{2}{3}$  mm. from end (Pl. VIII. f. 10.).

*Hab.* Delagoa Bay to Mombasa and Nyassaland. In the Tring Museum 22 ♂♂, 12 ♀♀ from: Delagoa Bay, Dar-es-Salaam, Taveta (June and July), Mombasa.

The species is not rare in the coast districts from Delagoa Bay to Mombasa. In the specimens from tropical (German and British) East Africa the blue respectively white discal markings or bands are wider than in the individuals from Delagoa Bay. In the ♂♂ the blue streak at the internal margin of the forewing *above* is in specimens from Delagoa Bay 8 to 11 mm. long, in the individuals from tropical East Africa 11 to 14 mm.; patch SC<sup>2</sup>—R<sup>1</sup> of hindwing is 4 or 5 mm. long in the individuals from the one, 5 to 11 mm. in those from the other region, the whitish blue scaling in the apical portion of the cell is more restricted in the Delagoa Bay examples, and the outer edge of the blue area is, on the whole, less concave between the veins. In the ♀♀ from Delagoa Bay the band of the forewing is only 4 mm. wide at (SM<sup>1</sup>), against 6 to 10 mm. in individuals from German and British East Africa; the band of the hindwing is also obviously narrower both above and below.

The *Charaxes* recorded by Dr. Holland from Brit. E. Africa, as *Ch. xiphares*, *i.e.*, belongs to *Ch. violetta* according to a sketch which Dr. Holland kindly sent us.

d<sup>2</sup>. Median bars of hindwing below not continuous.

e<sup>3</sup>. Basal area of forewing pale blue.

### 31. *Charaxes bohemani*.

*Charaxes bohemani* Felder, *Wien. Ent. Mon.* III. p. 321. n. 22. t. 6. f. 3. ♂ (1859) (L. Ngami); Butl., *Proc. Zool. Soc. Lond.* p. 630. n. 31 (1865) (S. Afr. ?); id., *Lep. Exot.* p. 28. t. 10. f. 3. ♀ (1870) (Zambesi); Druce, *Proc. Zool. Soc. Lond.* p. 412. n. 8 (1875) (Angola); Stand., *Exot. Tauff.* p. 170 (1886) (Vivi, Congo); Butl., *Ann. Mag. N. H.* (6). VII. p. 42. n. 10 (1891) (Kandera, Oct.); Trim., *Proc. Zool. Soc. Lond.* p. 81. n. 38 (1891) (Omorora, Aug.); Butl., *Proc. Zool. Soc. Lond.* p. 649. n. 21 (1893) (Brit. C. Afr., Aug.); Selous, *ibid.* p. 16 (1894) (Manica); Trim., *ibid.* p. 44. n. 70 (1894) (Manica); Reb. & Rog., in Baumann, *Massailand* p. 332. n. 102 (1894) (Uha); Butl., *i.c.* p. 256. n. 20 (1895) (Zomba); id., *i.c.* p. 720 n. 15 (1895) (Zomba); id., *i.c.* p. 852. n. 16 (1896) (Nyassaland); id., *Ann. Mag. N. H.* (6). XVIII. p. 69. n. 6 (1896) (Nyassaland); id., *Journ. Linn. Soc. Lond.* XXV. p. 378. n. 79 (1896) (Angola; Congo; Ngama's; L. Mweru; Zomba; Kandera; Mamboia; S. Salvado; Zambesi); Lanz, *Iris* IX. p. 143 (1896) (Tanganika); Auriv., *Kongl. Sc. Akad. Handl.* XXXI. 5. p. 238. n. 36 (1899) (E. Afr.; W. Afr. south of Congo; not in Cape Colony and Natal). *Nymphalis bohemani*, Kirby, *Cat. Diurn. Lep.* p. 270. n. 32 (1871) (S. Afr.).

♂♀. Body *above* grey olive, four dots on head, a line behind eye and *underside* of palpi creamy buff; sides of breast and legs olivaceous, seldom creamy, *underside* of abdomen creamy (♂), or olive grey (♀).



♂. *Wings above* black, slightly bluish, nearly the basal half of forewing and basal two-thirds of hindwing pale blue, purplish in side-light.—Forewing ; outer edge of blue area oblique, the area extending to near apex of cell or a little beyond ; black outer area 4 to 8 mm. wide at  $SM^2$ , a white spot  $SC^4-SC^5$  6 to 9 mm. from apex of wing, oblique, 3 to 5 mm. wide anteriorly, often shaded with blue at edges, a smaller white and blue spot behind it, followed by one or more tiny blue dots ; faint pale blue marginal dots ; fringe white, except at ends of veins.—Hindwing : blue area limited in front by  $SC^2$ , except in basal third of wing where it extends to C, one or two blue patches before  $SC^2$ , posteriorly the area stops at ( $SM^1$ ), outer border convex ; black outer area 7 to 13 mm. wide at  $SC^2$ , narrowing behind, 4 to 6 mm. broad at  $M^1$  ; a series of pale blue submarginal dots, upper one often obsolete ; admarginal pale blue spots transverse, mostly incised between veins, creamy at veins, upper ones obsolete ; abdominal fold olive grey, the scales within the fold bluish ; fringe white, black at tips of veins.

*Underside* varying from pale fawn colour to purplish seal brown, outer marginal region paler than rest of wings.—Forewing : white or bluish white borders of bars prominent ; cell-bars almost straight ; bar D faint ; two submedian bars  $M^1-(SM^2)$  slightly varying in position, bar  $M^1-M^2$  proximal of base of  $M^1$  ; median bars  $R^3-SM^2$  in an oblique row, corresponding to the outer edge of the blue area of the upperside, almost continuous, each bar more or less concave, bar ( $SM^1$ )- $SM^2$  often vestigial, sometimes reaching discal bar  $M^2-SM^2$ , median bar  $R^2-R^3$  close to apex of cell, bar  $R^1-R^2$  in front of it, but seldom clearly marked ; ground colour outside the median bars rather paler than rest of disc, the pale band-like area corresponding to the white band of the ♀ ; black discal bars  $M^2-SM^2$  fused to one thin lunule, the other discal bars also luniform, but small, gradually disappearing towards costal margin, each followed by a yellow lunule of larger size, the upper two, however, white as above, shaded with ochraceous at edges, the uppermost one not quite so large as on upperside, the yellow spots  $R^1-M^1$  small, the series about parallel to outer margin of wing, except uppermost spot, which is more proximal than the others, distance of series from margin about 7 to 9 mm. ; of the postdiscal bars at the outside of the yellow spots only the last three are well marked, being represented by black triangular patches outwardly bordered with pale blue, this blue border resembles the number 3 between  $M^2$  and  $SM^2$ .—Hindwing : bars very much thinner than on forewing, the thin white borders, especially of the median and discal series, more prominent than the black bars, these being partly obsolete ; basal costal bar curved, pointing with upper end towards the bent of PC, seldom absent (in one of Felder's two specimens) ; subbasal bars C—M nearly continuous ; costal submedian bar variable in position, often in front of subbasal bar C— $SC^2$ , submedian bars C—M about 2 mm. from subbasal ones, entering cell at or beyond base of  $R^1$  ; bar D very thin, without white edge ; series of median bars very irregular, bars  $SC^2-R^1$  and  $R^2-R^3$  much more basal than the others, bars  $M^2-SM^3$  feeble, at  $M^2$  about 4 mm. from discal bar ; all the discal bars luniform, their white borders alone present in some specimens, except bar  $M^1-SM^2$ , which is always well marked, the series regular, bar C— $SC^2$  only more basal than the others, the white borders contiguous with wax yellow, more or less distinct, spots which are distally bordered by vestiges of the postdiscal bars, postdiscal bar  $M^2-SM^2$  prominent, parallel to discal one ; a series of small submarginal white-blue-black dots, sometimes nearly all obsolete ; admarginal lunules wax yellow, buffish at veins, upper ones

obsolete, anal one olive buff; tails slender, acute, upper one 4 to 6 mm. long, second  $2\frac{1}{2}$  to 4 mm.

♀. *Wings above*.—Forewing with a white band bordering the blue basal area, the band about 7 mm. broad at  $SC^{4,5}$ , slightly increasing in width posteriorly, as far as  $M^2$ , then much narrower, partition  $M^2-SM^2$  trapezoidal, narrowest before  $SM^2$ , upper angle of cell and cross-veins black, sometimes also a black patch at proximal side of band before  $M^1$  and another behind  $M^1$ , outer edge of band concave between  $M^2$  and  $SM^2$ , and here edged with blue; white subapical (postdiscal) patches as in ♂.—Hindwing: as in ♂, but admarginal lunules larger.

*Underside*.—Forewing: white band as above, bordered proximally by the obliquely placed, heavy, median bars, the band contiguous posteriorly with the discal bar  $M^2-SM^2$ ; yellow postdiscal spots heavier than in ♂; interspace between submedian and median bars  $M^1-M^2$  often all black.—Hindwing: postdiscal and admarginal yellow markings larger than in ♂; discal interspaces sometimes with a vestige of a buffish band at the outer side of the median bars; upper tail of nearly even width, not acute, 8 mm. long, second pointed, 4 mm. long.

Length of forewing: ♂, 36 to 44 mm.

” ” ♀, 45 to 47 mm.

Penis-funnel broad, blunt; penis resembling that of *Ch. bipunctatus*, the ridge-like dorsal tooth less compressed proximally.

*Hab.* From Lake Ngami northwards to the Lower Congo and the Massailand, not in Cape Colony and Natal. In the Tring Museum 11 ♂♂, 7 ♀♀, from: Lake Ngami (Wahlberg, *type*); Blantyre; Likoma, l. viii. 96 and 23. ix. 96 (Dutton); Zomba, x. to vii. 95 (Dr. Percy Rendall); Mineni Valley, Manica, 17. iii. 92 (Selous); Kuhliriri R., Angola, xi. 99 (Penrice); Mkengi, Lower Congo; Karimia, Congo Free State, near border of Toru, l. v. 99 (Dr. Ansonge).

The individuals (♂♂) from Ngami, collected by Wahlberg, from which Felder described the species, are much smaller than individuals from other localities, and have the underside of the body uniformly cream colour and the undersurface of the wings pale fawn; there are two specimens in the Felder collection marked *type*; others also so marked are in the Stockholm Museum.

Mr. Crawshay, *Ann. Mag. N. H.* (6) XVIII. p. 69, says: “Very rarely met with, and almost impossible to take unless when indulging its foul appetite for putrid flesh or excrement. This specimen I took feeding on leopard’s excrement at the side of the path in open forest.”

*f*<sup>3</sup>. Basal area of forewing not pale blue.

*c*<sup>1</sup>. ♂, hindwing with broad pale blue, or pale blue and white, band; basal half of underside of forewing not bluish grey; ♀, hindwing with a broad bluish white or buffish band.

### 32. *Charaxes xiphares*.

♀. *Papilio Eques Achirus xiphares* Cramer, *Pap. Exot.* IV. p. 171. t. 377. f. a. b (1781) (Cap. b. sp.); Fabr., *Mant. Ins.* 11. p. 11. n. 98 (1787).

♂. *Papilio Eques Argonauticus thyestes* Stoll, in Cram., *Pap. Exot. Suppl.* p. 144. t. 32. f. 2. 2b (1790).

♀. *Papilio Eques Achirus xyphares* (!), Jablonsky & Herbst, *Natura. Schmett.* IV. p. 47. n. 146. t. 60. f. 5. 6 (1790).

♀. *Papilio Nymphalis xiphares*, Fabricius, *Ent. Syst.* III. 1. p. 71. n. 221 (1793).

*Eriboea thyestessa* (!) Hübner, *Verz. bek. Schmett.* p. 47. n. 432 (1816-27).

*Eriboea xypharis* (!) Hübner, *l.c.* n. 434.

- ♂. *Nymphalis thurius* Godart, *Enc. Méth.* IX. p. 354. n. 15 (1823) (Caffraria; synonym. "thieste Stoll"! ).
- ♀. *Nymphalis xiphares* Godart, *l.c.* p. 357. n. 25 (1823) (Cap. b. sp.); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 19 (1850) (Cap. b. sp.).
- ♀. *Charaxes xiphares*, Doubleday, *List. Lep. Ins. Brit. Mus.* I. p. 111 (1844) (Cap. b. sp.); Butl., *Proc. Zool. Soc. Lond.* p. 631. n. 35 (1865) (Cap. b. sp.; ♀ of *thieste*?).
- ♂ ♀. *Charaxes xiphares*, Boisduval, in Delegorgue, *Voy. Afr. Austr.* II. p. 593. n. 81 (1847) (Pt. Natal; ♀ = *xiphares*, ♂ = *thiestes*); Butl., *Cat. Diurn. Lep. descr. Fabricius* p. 51. n. 7 (1869) (S. Afr.); Trimen & Bowk., *S. Afr. Bull.* I. p. 346. n. 117 (1887) (Cape Colony; Caffraria); *ibid.*, *l.c.* III. p. 408 (1889) (Barberton); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 376. n. 75 (1896) (Cap. b. sp.); Dist., *Ann. Mag. N. H.* (7) I. p. 51 (1898); Auriv., *Kongl. Sv. Akad. Handl.* XXXI. 5. p. 239. n. 42 (1899) (Cape Colony, Caffraria; not Brit. E. Afr.).
- ♂. *Nymphalis thieste* (!), Doubleday, Westw. & Hew., *l.c.* p. 309. n. 18 (1850) (Caffraria; "an *N. xiphares* mas?").
- ♂ ♀. *Nymphalis xiphares*, Trimen, *Rhop. Afr. Austr.* I. p. 167. n. 97 (1862) (pt.); Kirby, *Cat. Diurn. Lep.* p. 270. n. 33 (1871) (Afr. m.).
- ♂. *Charaxes thieste* (!), Butler, *Proc. Zool. Soc. Lond.* p. 631. n. 34 (1865) (Caffraria; " *thurius* Godart," " *thiestessa* Hübn." err. calam.).

♂ ♀. *Body above*, olive black, head and collar more russet brown, four dots on head and a line behind eye white; *beneath* sepia brown, palpi clay colour, with the vestige of a white line close to eye, abdomen dark clay colour in ♂; femora speckled with white scaling.

♂. *Wings above*: bluish black, with pale blue markings, which assume a purplish tint in side-light.—Forewing: four discal spots between  $R^1$  and  $M^2$ , the upper two 1 or 2 mm. from cell, small, the other two a little larger and more distal; a complete series of postdiscal dots, parallel to outer margin, curving basad at both ends, the middle one the smallest, 8 mm. from outer margin, all blue except the upper two, which are white; margin with ill-defined ochraceous dots; fringe white, except at ends of veins.—Hindwing: a blue band across middle from C to abdominal fold, interrupted at  $SC^2$ , indented upon the other veins, proximally sinuate between  $R^1$  and  $R^2$ , width 6 mm. between  $SC^2$  and  $R^1$ , 9 mm. before  $M^2$ , its outer edge, taken as a whole, somewhat convex, posteriorly nearer the margin of wing than in front, distance at  $M^1$  9 mm.; a complete series of blue submarginal dots, all separated; a series of ill-defined, ochraceous, admarginal spots, which mostly extend to edge of wing upon internervular folds; abdominal fold olive, paler towards abdominal margin.

*Underside*: sepia brown, outer area slightly shaded with ochraceous, discal interspaces of both wings drab at outer side of median bars; resembling the underside of *bohemani*, but bars of hindwing heavier.—Forewing: bar edged with bluish white; cell-bars almost straight, faintly concave proximally, cell, except apical interspace, drab brown; submedian bars  $M^1$ — $SM^2$  continuous with one another and with cell-bar 4; bar D thin; median bars  $R^3$ — $SM^2$  in a very oblique row, the last touching discal bar, all three slightly concave distally, with rather heavy bluish white borders, median bar  $R^2$ — $R^3$  only 1 to 2 mm. from cross-vein; discal series of bars obsolete towards costal margin, contiguous with gallstone yellow halfmoons at outer side up to  $R^1$ , between  $SC^4$  and  $R^1$  the halfmoons are replaced by two white, rounded, dots; contiguous with these spots are the postdiscal patches of which patches  $M^1$ — $SM^2$  are large and black, while the others are small and olive and ill-defined, patches  $M^1$ — $SM^2$  heavily bordered with blue distally, the blue scaling between  $M^2$  and  $SM^2$  resembling the number 3; admarginal interspaces somewhat ochraceous gallstone yellow, this colour more obvious between  $M^1$  and  $SM^2$ .—Hindwing: basal costal bar farther away from PC than in *Ch. bohemani*: no costal

subbasal bar ; costal submedian bar more basal than the other two submedian bars ; subbasal and submedian bars C—M nearly parallel, rather closer together than in *bohemani* ; bar D thin ; costal median bar a little more distal than median bar C—SC<sup>2</sup>, all median bars with rather heavy, white, outer border, bars R<sup>1</sup>—R<sup>3</sup> continuous, R<sup>1</sup>—R<sup>2</sup> being very little more distal than R<sup>2</sup>—R<sup>3</sup>, while bar R<sup>3</sup>—M<sup>1</sup> is about 2 mm. more distal ; discal bars luniform, upper ones less well-defined than the posterior ones, bars R<sup>1</sup>—R<sup>3</sup> more distal, all followed by ochraceous gallstone yellow halfmoons, which are bordered distally by the ill-defined, more or less patch-like, postdiscal bars ; a series of white and blue submarginal spots, posterior ones succeeded by black dots ; admarginal interspaces tawny olive ; tails short, triangular, blunt, upper one 2½ mm. long, second 2 mm.

♀. *Wings above* : blackish brown, slightly purplish.—Forewing : an oblique band of five patches, upper three between SC<sup>5</sup> and R<sup>3</sup> 1 to 2 mm. from cross veins, fused together, the veins being very thinly brown, about 4 to 5 mm. wide, patch R<sup>3</sup>—M<sup>1</sup> 7 mm. from base of M<sup>1</sup>, diameters 4 and 5 mm., patch M<sup>1</sup>—M<sup>2</sup> obliquely behind it, very oblique, often touching distally the postdiscal spot, behind M<sup>2</sup> there is often a sixth, small, white spot ; a postdiscal series of small spots as in ♂, upper two white, the others more or less ill-defined, sometimes vestigial, buff ; marginal dots ochraceous buff, indistinct, except dots M<sup>2</sup>—SM<sup>2</sup>.—Hindwing : a very broad buff band occupying centre of wing from costal to abdominal margin, about 9 mm. broad behind SC<sup>2</sup>, 16 mm. in middle, shaded with fuscous behind (SM<sup>1</sup>), partition C—SC<sup>2</sup> often whitish, mostly with a small spot at outer side, often reduced in size and separated from rest of band ; band penetrating into cell, its inner edge ill-defined, outer edge convex, not quite parallel to outer margin of wing, more or less indented upon veins, subangulate before R<sup>3</sup> ; a series of pale blue submarginal dots, partly centred white ; admarginal interstitial parts transverse, ochreous or ochraceous buff, spots C—SC<sup>2</sup> absent, SC<sup>2</sup>—R<sup>1</sup> mostly vestigial ; fringe white, except at tips of veins.

*Underside* somewhat paler than in ♂, drab brown.—Forewing : bars as in ♂ ; median bar R<sup>1</sup>—R<sup>2</sup> often marked ; white discal patches as above, rather wider, bordered proximally by the median bars, of which bars R<sup>3</sup>—M<sup>2</sup> are continuous, interspace between curved bar M<sup>2</sup>—SM<sup>2</sup> and discal bar also white ; postdiscal interstitial spots SC<sup>4</sup>—R<sup>1</sup> white, larger than in ♂, rounded, the following three white proximally, yellow distally.—Hindwing : slightly paler than forewing ; median bars with heavy white outer border, which often develops to a white band which is extended to the discal luniform bars, but remains more or less shaded with drab brown distally ; white submarginal spots arched, blue ones rather large, except upper two or three ; admarginal gallstone yellow interstices rather well-defined ; upper tail of nearly even width, rounded at tip, 9 mm. long, second short, triangular, blunt, curving frontad, 4 mm. long.

Length of forewing : ♂, 43 mm.

“ ” ” ♀, 50 to 52 mm.

*Hab.* Cape Colony and Natal. In the Tring Museum 1, ♂ 3 ♀ ♀ from Natal.

“This grand *Charaxes*,” says Trimen, *l.c.*, p. 348, “inhabits the woods of the Cape Colony and of Kaffraria Proper as far eastward as the Bashee river. In Natal it is replaced by the closely allied *C. cithaeron*, Feld., which does not as yet appear to have been taken elsewhere. The actual district in Kaffraria where *xiphares* gives place to *cithaeron* is not known. At Knysna and Plettenberg Bay I met with *C. xiphares* not uncommonly from the middle of December until the middle



of May. Both sexes haunt by preference the outskirts of woods, seeming to delight in short flights of great velocity over open spaces, ending in a return to the tree stem or projecting twig they have quitted. The moist exudations on the trunks and branches always attract this butterfly, and I have frequently seen three or four specimens together busily engaged in drinking at one of the supplies of moisture. I have more than once disturbed a ♀ at rest on quite a low bush, but the ♂, though occasionally descending to within a few feet of the ground, never appears to settle except at a considerable height. Mrs. Barber has often observed the ♀ at highlands near Grahamstown—and I noticed examples there and at Mitford Park in 1870—but singularly enough has never seen the ♂ on the wing. Colonel Bowker, who forwarded several fine examples of both sexes from Kaffraria Proper, noted the species as 'rare' on the Bashee River. Mr. W. C. Scully, who has lately (1885) observed the species in woods near Seymour (Eland's Post), found that a large number of these butterflies were attracted by the sap exuding from a climbing composite shrub, the stem of which he had wounded for the purpose."

### 33. *Charaxes cithaeron*.

*Charaxes cithaeron* Felder, *Wien. Ent. Mon.* III. p. 398. t. 8. f. 2. ♂. 3. ♀ (1859) (Natal); Butl., *Proc. Zool. Soc. Lond.* p. 631. n. 33 (1865) (Natal); Gooch, *Entom.* XIV. p. 6. 7 (1881) (Natal, larva); Spiller, *ibid.* XV. p. 8 (1882) (Natal); Staud., *Exot. Tagg.* p. 170 (1886) (Natal); Dewitz, *Nor. Act. Leop. Car. Ak. Nat. L.* 5. p. 371 (1887) (Ngura); Trim. & Bowk., *S. Afr. Butt.* I. p. 345. n. 116 (1887) (Natal, metam. !); Butl., *Proc. Zool. Soc. Lond.* p. 649. n. 23 (1893) (Zomba, ♀); Trim., *ibid.* p. 45. n. 71 (1894) (Manica); Butl., *l.c.* p. 256. n. 19 (1895) (Zomba), *id.*, *l.c.* p. 720. n. 14 (1895) (Zomba); *id.*, *Journ. Linn. Soc. Lond.* XXV. p. 375. n. 70 (1896) (Natal; Transvaal; Zomba; Kilimandjaro); *id.*, *Proc. Zool. Soc. Lond.* p. 397. n. 10 (1898) (Brit. E. Afr.); Auriv., *Kongl. Sc. Ak. Handl.* XXXI. 5. p. 239. n. 41 (1899) (pt.; Natal; Transvaal; Manica; Nyassa; Kilimandjaro; Brit. E. A.).  
*Nymphalis xiphares* var. *A. (cithaeron)* Felder, Trimen, *Rhop. Afr. Austr.* p. 169. sub n. 97 (1862) (Natal).  
*Nymphalis cithaeron*, Kirby, *Cat. Diurn. Lep.* p. 270. n. 33a (1871) (Natal).

♂ ♀. *Body* above olive black, anteriorly slightly russet, four dots on head, a line behind and two dots on collar cream colour; *underside* clay-colour, sides of breast darker, palpi of both sexes and abdomen of ♂ almost creamy buff, palpi with the vestige of a white line close to eye; femora black with white, dispersed, scales.

♂. *Wings* above blue-black, glossy in basal area, with pale blue markings, which assume a purple tint in side-light.—Forewing: a series of pale blue discal spots; three spots  $SC^5-R^3$  elongate, close to cross-veins, the uppermost often absent, two spots  $R^3-M^2$  more distal, generally smaller, seldom a little larger than the blue-black interspace between them, distally often concave, the second sometimes oblique, two more spots between  $M^2$  and  $SM^2$ , sometimes vestigial, often merged together; a postdiscal series of spots, parallel to outer margin, but spot  $SC^4-SC^5$  more proximal, upper two white, the others pale blue, spot  $R^1-R^2$  the smallest, diameter about 1 mm., the following often little larger, but sometimes gradually and considerably increasing in size, spots  $M^2-SM^2$  not rarely merged together, forming with the respective discal spots a large square patch, the centre of which shows, however, some blue-black scales of the ground colour, this patch, about 6 mm. from outer margin in front of  $SM^2$ ; along internal margin, behind the discal and postdiscal series, stands a long pale blue patch, varying in length from 8 to 15 mm., often very narrow, sometimes contiguous with patch  $M^2-SM^2$ ; marginal dots buffish or bluish, only the posterior ones marked in most individuals;

fringe white, except at ends of veins.—Hindwing: a bluish white patch, which is more white behind than in front, extends from  $R^1$  to abdominal fold, is 6 to 8 mm. broad behind  $R^1$ , and 12 to 14 at  $M^2$ , it stops proximally mostly at  $D^3$ , but apex of cell generally with some bluish white sealing, and reaches behind cell to base of  $M^2$ , outer edge of patch incised at  $R^2$ , and often also at  $R^3$ , mostly slightly concave between posterior veins; the patch is preceded by a rounded or elongate spot in front of  $R^1$ , this spot seldom contiguous with the patch; before  $SC^2$  we find one discal and one postdiscal spot, either of the two often absent, sometimes both wanting; black outer area gradually narrowing behind, 4 to 6 mm. broad at  $M^1$ , 7 to 8 mm. at  $R^2$ ; a complete series of pale blue submarginal spots, well-marked, but spot C— $SC^2$  occasionally absent, more or less rounded, posterior ones sometimes transverse, mostly with minute white centres; admarginal interstitial spots yellow or yellow buff, transverse, pointing distad at ends, often shaded with blue in middle, or interrupted, posterior ones mostly touching each other at veins, no such spot before  $SC^2$ , spot  $SC^2$ — $R^1$  also often absent; fringe creamy white between veins; abdominal fold dirty white, clayish distally, often somewhat bluish in centre, base mostly blackish, long hairs in front of it black in basal two-fifths, then dirty white.

*Underside* pale tawny olive, with a gallstone yellow tint, bars individually variable in thickness.—Forewing: discal interspaces yellowish at outside of median bars, cell often of the same yellow tint; basal cell-bar often indicated by an obscure dot, cell-bar 2 nearly straight, 3 slightly curved, occasionally interrupted, bar 4 mostly distinctly curved twice in costal half; bar D thin, but complete; submedian bars 1 to 2 mm. apart, bar  $M^1$ — $M^2$  proximal of base of  $M^1$ , but distal of lower end of cell-bar 4, submedian bars and upper cell-bar with a thin bluish white distal border, besides the normal bluish white proximal border, cell-bars 2 and 3 with distinct bluish white border at both sides; median bars  $R^3$ — $SM^2$  concave distally, sometimes angle-shaped, the bars generally touching each other, forming an oblique series, bars  $M^2$ — $SM^2$  mostly fused together either to a single halfmoon, or to a marking which resembles the number 3, 5 to 7 mm. distant at ( $SM^1$ ) from discal lunule, median bars  $R^1$ — $R^3$  1 to 2 mm. from cross-veins, the upper of the two often vestigial or absent; discal bars  $M^1$ — $SM^2$  distinct, black, regularly arched, the other discal bars vestigial or absent, forming the proximal borders of a series of postdiscal interstitial spots, of which the upper two are white, the others ochreous yellow, and which are situated as on *upperside*; postdiscal bars  $M^1$ — $SM^2$  represented by black spots, the other postdiscal bars not often vestigial, spots  $M^2$ — $SM^2$  merged together to a large patch which is incised distally upon ( $SM^1$ ), and has a conspicuous, pale blue, outer border which resembles the number 3, patch  $M^1$ — $M^2$  also more or less obviously bordered blue distally; admarginal interspaces ill-defined, wax yellow; marginal dots buff, often obsolete, internal area (or part of it) from ( $SM^1$ ) to internal margin often fuscous.—Hindwing: bars thinner than on forewing, sometimes partly obsolete; costal subbasal bar at outer side of PC mostly absent, costal submedian bar always in front of subbasal bar C— $SC^2$ , either straight or pointing distad; costal median bar a very little more proximal than median bar C— $SC^2$ , or just in front of it; discal bar  $SC^2$ — $R^1$  generally only 1 mm., seldom 2 mm., more proximal than bar C— $SC^2$ ; admarginal gallstone yellow interstitial markings paler at veins, shaded with olive buff between veins, especially the posterior ones, anal one all olive buff; white submarginal dots mostly all present, followed by blue ones

of which the upper two or four are often obsolete, and these followed again by black dots which are generally present at least between veins  $R^2$  and  $SM^2$ ; discal bars short and thin, postdiscal ones mostly obsolete, or only vestigial; tails pointed, upper one 5 to 7 mm. long, second 3 to  $4\frac{1}{2}$  mm.

♀. *Wings above* purplish seal brown, somewhat paler at base, long hairs in basal area of hindwing olivaceous.—Forewing: a transverse, curved, discal band from costal to inner margin, 1 to 2 mm. from cross-veins, white, slightly shaded with violet at edges, especially behind, its inner edge triangularly sinuate at hinder side of  $R^3$ , convex between the veins, but mostly concave between  $M^2$  and  $SM^2$ , outer edge sinuate between  $R^2$  and  $R^3$  in most specimens, more or less indented upon veins, the band widest (8 to 12 mm.) between  $M^1$  and  $M^2$ , but on the whole of nearly even width, patch at internal margin often prolonged, the streak along costal margin also generally prolonged basad; postdiscal series of spots represented, at least, by two white spots  $SC^4-R^1$ , which are larger than in ♂, often shaded with violet at edges, and followed in many specimens by one to four small buffish white dots the last one of which, between  $M^1$  and  $M^2$ , often touches the band; admarginal buff dots  $M^2-SM^2$  often present.—Hindwing: a large white central patch, much shaded with purple, especially at edges, variable in width, expanded between costal margin and abdominal fold, proximally limited by median bars  $C-R^1$ , which are vestigial or show through from underside, penetrating a little into apex of cell, or stopping at  $D^3$ , outer edge convex, almost parallel to outer margin, but farther away from it in front than behind, width of patch before  $R^3$  10 to 14 mm., before  $SC^2$   $3\frac{1}{2}$  to 6 mm., at outer side of band before  $SC^2$  there is sometimes an isolated postdiscal spot, similar spots occasionally indicated between  $SC^2$  and  $R^3$ , more or less incompletely isolated; abdominal fold bluish white, buff or clay colour distally; submarginal blue spots as in ♂, often larger, posterior ones mostly transverse; admarginal interstitial spots as in ♂, spot  $SC^2-R^1$  generally better marked, colour varying from cream to ochreous, posterior spots sometimes nearly all blue.

*Underside* similar to that of ♂, band of forewing as above, but less curved, patch  $M^2-SM^2$  square or posteriorly narrower than anteriorly, often completely divided by a black streak on ( $SM^1$ ); discal interspaces of hindwing most pale clay-colour at median bars; upper tail of nearly even width, not pointed, 8 to 10 mm. long, second pointed, slightly curved frontad, 4 to 6 mm. long.

Length of forewing: ♂, 42—46 mm.

„ „ ♀, 46—52 mm.

Penis closely resembling that of *Ch. bipunctatus*, being armed with a sinistrolateral subapical tooth and, proximally, with a dorsal tooth-like ridge.

*Hab.* East Africa from Natal northwards to Nyassaland, German and British East Africa; its northern limit is most likely the Victoria Nyanza and the hills south of the Kenia. In the Nandi country the western *Ch. smaragdalis* already appears. In the Tring Museum 2 ♂♂, 12 ♀♀ from: Durban, Natal; Rikatla, Delagoa Bay; Lauderdale, and Zomba (October to December), Brit. C. Afr.; Mikindani, Germ. E. Afr.; Mombasa.

The *males* from Natal, Delagoa Bay, Nyassaland, Mozambique, and the coast region of German East Africa do not apparently exhibit any geographical variation, the *females* from Mombasa, British East Africa, differ obviously from the individuals from the other localities mentioned; while in the Natal ♀♀ the white band of the forewing above is 8 to 10 mm. distant from outer margin of



wing behind  $M^2$ , the distance is only 6 mm. in the ♀♀ from Mombasa, the band being broader in these individuals (11 mm.); on the hindwing the band is also very wide in the latter specimens, the black outer area of the wing measuring only 8 mm. at  $M^1$ , the band is 15 mm. wide at  $M^2$  in one specimen, 16 mm. in the other; the discal bar  $M^2-SM^2$  separating the white band on the underside of the forewing from the yellow lunule is very thin, being composed of scattered black scales, and the median bar  $M^2-SM^2$  is less oblique than in the ♀♀ from other places.

A ♀ in the Berlin Museum from Usaramo, German East Africa (Stuhlmann) agrees fairly well with the Mombasa examples. It is possible that the differences here pointed out will be found to be more or less constant.

Dr. Trimen (*l.c.*) gives the following description of the larva and the habits of *Ch. cithaeron* :—

“LARVA.—Deeper or lighter green, closely granulated with yellow, on back; light bluish green or light bluish grey on under surface; a chrome-yellow lateral-inferior stripe from second segment to anal extremity, which is bifid into two acute processes of the same yellow as the stripes. On sixth and eighth segments the yellow stripes are connected by a backward-curved, almost semicircular, transverse, yellow stripe; on back, just preceding the hinder portion of each transverse stripe, a dark purple spot, composed of two small spots connected by indistinct purple lineolae. On each side of eleventh segment, a small yellow spot, just above longitudinal stripe. Head rather large, green, surmounted by four serrated green horns (of which the two middle ones are longer than the others and divergent); face and outer edge of horns bordered with yellow; between the two middle horns a pair of small, acute, black-pointed tubercles. Feeds on the flat-crown acacia (*Zygia fastigiata*) in March and April.

“PUPA.—Light green, slightly maculated with white. A silvery white line running along curved edges of wing covers to summit of head, interrupted on the line of the antennae. Anal segment produced, and bearing three pairs of small pointed tubercles.

“The above description of the larva and pupa are made from notes and drawings of Natalian specimens communicated to me by Captain H. C. Harford and Mr. W. D. Gooch. The former gentleman wrote that he found several of the larvæ almost full-grown in the month of April, and that shortly before becoming pupæ they changed to a very light green. The butterflies were disclosed after thirteen days' pupation.

“This close ally of *C. xiphures* (Cram.) is readily recognised by the characters given above, which appear to be quite constant. It seems also to be quite a local form, as I have seen no examples except from the coast of Natal, and have found no record of its occurrence elsewhere.

“At D'Urban, Port Natal, *cithaeron* is of very frequent occurrence. From the middle of February to the beginning of April 1867 I observed many specimens of both sexes, frequenting chiefly the ‘sucking places’ on the stems and branches of *Zygia fastigiata* (the flat-crown acacia), on which tree, as above noted, the larva lives, and of *Acacia lebbeck*. Another favourite resort of this butterfly was an exudation on the stem of *Oncoba spinosa* in the Botanic Garden. In habits and flight it entirely resembles its close congener. I observed a specimen on the wing on June 23rd, 1865; and Colonel Bowker has taken examples in the month of August; but they are only numerous in the summer months. When within reach, specimens engaged in feeding are easily captured. The paired sexes were taken by Colonel Bowker, and sent to me in August 1881.”



34. *Charaxes smaragdalis*.

*Charaxes smaragdalis* Butler, *Proc. Zool. Soc. Lond.* p. 630. n. 32 t. 36. f. 5. ♂ (1865) (Congo);  
id., *Lep. Exot.* p. 5. t. 2. f. 1. ♀ (1869) (Congo).

Differs from *Ch. cithaeron* constantly in the following characters:—

♂. *Wings above*: large blue patches of forewing from  $M^2$  (or  $M^1$ ) to internal margin a little more distal; band of hindwing pale blue, whitish only proximally at abdominal fold, broader, especially in the middle, than in *cithaeron*, hence black outer area more reduced; admarginal spots blue, nearly white at veins.—*Underside*: bars much heavier than in *cithaeron*, especially on forewing, ground colour darker, more olive, hence the pale yellowish spots more prominent; postdiscal patches of forewing distally bordered by pale bluish half-rings.

♀. *Wings above*: band of forewing more blue behind, less curved; band of hindwing blue, admarginal spots blue, almost white at veins.—*Underside*: darker, bars of forewing a very little thicker, postdiscal patches of forewing as in ♂.

To these distinguishing characters we must add the greater size of the blue patches on the forewing between  $M^2$  and internal margin and on the hindwing between C and  $R^1$ , but these characters vary so much in either species that they cannot serve to distinguish all specimens of the one from all individuals of the other.

A ♂ from Ran, Nandi country, British East Africa, and another from Landana, Congo Free State, have patch  $M^2$ — $SM^2$  of the forewing not broader than certain examples of *Ch. cithaeron* from Natal and Nyassaland.

Penis and penis-funnel as in *Ch. cithaeron*.

*Hab.* West Africa from Sierra Leone to Angola, and as far east as the Nandi country in the Uganda Protectorate.

*Ch. cithaeron* and the two local forms of *Ch. smaragdalis* are geographical representatives. The characters of the individual from British East Africa mentioned before (unfortunately in a very bad state of preservation) make it probable that a longer series from the interior of British East Africa will show all the connecting links between *smaragdalis* and *cithaeron*, which are as yet wanting.

*Charaxes smaragdalis* has, like most of the *Charaxes* with a wide range, developed into a north-western race extending from Sierra Leone to the Gold Coast and an equatorial race found from the Niger Coast to the Congo basin and the Uganda Protectorate.

Dr. Butler described *Ch. smaragdalis* from the Congo in 1865; the name of *smaragdalis* must, therefore, be applied to the equatorial race (and to the entire species). In 1896 Dr. Butler described again as *Ch. princeps* specimens from the Cameroons which he thought to be specifically distinct from *Ch. smaragdalis* on account of the reduction of the blue patch  $M^2$ — $SM^2$  on the forewing and the greater extent of blue in the marginal region of the hindwing. These and some other points mentioned by Dr. Butler, indeed, hold good, on the whole, if one compares Cameroons examples with individuals from Sierra Leone and the Gold Coast, but not if "*princeps*" is compared with Congo specimens. Our series of specimens from the Congo basin shows clearly that *princeps* is nothing else but *smaragdalis*. The main character by which all the examples from the Cameroons and Congo can be distinguished from the specimens from the more northern parts of the West Coast, namely the greater size of the discal series of spots on the upperside of the forewing as

compared with the postdiscal series, is not mentioned by Dr. Butler. As *princeps* applies, therefore, to the same race to which the name of *smaragdalis* was originally given, the north-western race requires a name.

#### a. *Ch. smaragdalis smaragdalis*.

*Charaxes smaragdalis* Butler, *l.c.* t. 36. f. 5. ♂ (1865); *id.*, *Lep. Escot.* p. 5. t. 2. f. 1. ♀ (1869); Godm. & Salv., in Jameson, *Story Rear Column* p. 440. n. 84 (1890) (Yambuya); Auriv., *Ent. Tidskr.* XII. p. 216. n. 145 (1891) (Cameroons); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 375. n. 71 (1896) (pt.; Cameroons, Congo); Auriv., *Kongl. Sv. Ak. Handl.* XXXI. 5. p. 238. n. 37 (1899) (pt.; Cameroons, Congo).

*Nymphalis smaragdalis*, Kirby, *Cat. Diurn. Lep.* p. 270. n. 33b (1871) (Congo).

*Charaxes cithaeron*, Dewitz, *Nor. Act. Leop. Car. Ak. Nat. L.* 4. p. 371 (1887).

*Charaxes princeps* Butler, *l.c.* p. 376. n. 72 (1896) (Victoria, Cameroons).

*Charaxes smaragdalis* var (ab.?) *princeps*, Aurivillius, *l.c.* p. 238. sub n. 37 (1899) (Victoria, Cameroons).

♂. *Wings above*.—Forewing: discal spots very much larger than the postdiscal ones, spot  $M^1$ — $M^2$  at least twice (mostly three or four times) as large as the respective postdiscal one, separated from it, obliquely concave distally; patch  $M^1$ — $M^2$  complete or subdivided by one or two black spots into a larger discal and smaller postdiscal portion, its outer edge mostly biconcave,  $2\frac{1}{2}$  to  $3\frac{1}{2}$  mm. from edge of wing before  $SM^2$ , breadth of patch  $5\frac{1}{2}$  to 12 mm.; postdiscal spots  $R^1$ — $M^1$  often minute; outer edge of wing sometimes very feebly concave, and the apex less acute than in the north-western race, but this character is quite inconstant.—Hindwing: blue area expanded between  $SC^2$  and abdominal fold, patch  $SC^2$ — $R^1$  not separated, but often reduced in width; in front of  $SC^2$  there are two spots, often merged together to one large patch which is generally sinuate in front, but is occasionally complete, proximal spot seldom obsolete, blue one much extended distad, in many specimens reaching blue admarginal spots, in which case the black area between blue patch and admarginal spots is posteriorly divided into more or less small spots in which are situated the white and blue submarginal dots.

*Underside*: median bars  $R^2$ — $M^2$  of forewing strongly concave, bars  $M^2$ — $SM^2$  very heavy, fused to a W-shaped mark.

♀. *Wings, above*.—Forewing: band 2 to 3 mm. from outer margin before  $SM^2$ ; a series of postdiscal spots, upper two larger and white, the others minute and blue.—Hindwing: blue area extended distally as in ♂, the black outer area reduced in width, posterior patches more or less isolated, outer edge of blue area regularly concave between veins from  $R^1$ — $SM^2$ .

Length of forewing: ♂, 42—50 mm.

“ “ ♀, 50 mm.

*Hab.* Nigerto Angola and Uganda Protectorate. In the Tring Museum from: Rau, Nandi Country, Uganda Protectorate, December 12th, 1898 (Dr. Ansorge), 1 ♂; Landana, 1 ♂; Congo and Kassai Country, 6 ♂♂, 1 ♀. In the British Museum from Victoria, Cameroons, and Congo; in the Berlin Museum from Angola (Mechow), and Old Calabar; Dr. Standinger has a ♀ from Lambarené, Ogowé.

In the width of patch  $M^2$ — $SM^2$  of the upperside of the forewing, the Rau specimen, as said before, does not essentially differ from certain examples of *Ch. cithaeron*, being only  $5\frac{1}{2}$  broad, the patch stands, however, closer to the outer margin; on the hindwing patch  $SC^2$ — $R^1$  measures only  $3\frac{1}{2}$  by 4 mm., and the patch before  $SC^2$  is divided up into two well-separated spots.

*b. Ch. smaragdalis butleri* Rothsch., subsp. nov.

*Charaxes smaragdalis*, Schaus & Clements, *Sierra Leone Lepid.* p. 9 (1893); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 375. n. 71 (1896) (pt.; Sierra Leone); Auriv., *Kongl. Sc. Akad. Handl.* XXXI. 5. p. 238, n. 37 (1899) (pt.; Sierra Leone).

♂. *Wings, above*.—Forewing: patch  $M^2-SM^2$  always complete, 5 to 7 mm. from edge of wing before  $SM^2$ , distally concave or nearly straight; discal and postdiscal spots  $M^1-M^2$  never quite separate, always merged together to one patch, which is deeply sinuate in front, the postdiscal portion mostly larger than the discal one, seldom somewhat smaller; postdiscal spot  $R^3-M^1$  as large as the discal spot  $R^3-M^1$ , often larger, seldom a little smaller, postdiscal spots ovate, none of them concave distally.—Hindwing: blue area less wide than in *smaragdalis*, patch  $C-SC^2$  not separated into a discal and postdiscal spot, the patch includes, however, often a black ovate spot which is not rarely joined to the black basal area, outer edge of blue area less regularly concave between veins than in *Ch. sm. smaragdalis*; the black outer area, though partly constricted at veins, not interrupted from  $C$  to  $SM^2$ .

*Underside* darker olive than in *sm. smaragdalis*, hence the patches of yellow clay-colour more prominent; bars in basal area of forewing a little thinner than in most *sm. smaragdalis*, bars  $M^2-SM^2$  forming a less heavy and less regularly W-shaped mark.

♀. *Wings, above*.—Forewing: band 6 to 8 mm. from outer margin before  $SM^2$ .—Hindwing: blue area less extended than in *sm. smaragdalis*, not so regularly concave between veins, indented upon  $SC^2$ , often also upon  $R^1$  and  $R^2$ , partition  $C-SC^2$  either complete or divided into a discal and a postdiscal portion; black outer area gradually narrower behind, not interrupted, but more or less constricted at veins  $M^1$  and  $M^2$ , about 5 mm. broad between  $M^1$  and  $M^2$ .

*Underside* darker olive than in *sm. smaragdalis*.

Length of forewing: ♂, 43–48 mm.

” ” ♀, 48–55 mm.

*Hab.* Sierra Leone to Gold Coast. In the Tring Museum from: Sierra Leone (*type*) 18 ♂♂, 14 ♀♀; Gold Coast, 3 ♂♂, 5 ♀♀.

This subspecies is named in honour of Dr. Butler, who has twice given a revision of the genus *Charaxes*, and who is doubly associated with the present species as author.

*d*<sup>1</sup>. Hindwing without a broad pale blue, white, or buff band, or the basal half of the forewing below is bluish grey.

35. *Charaxes monteiri*.

*Charaxes monteiri* Staudinger, *Ecot. Tagf.* p. 170. t. 59. ♂, ♀ (1886) (S. Thomé); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 376. n. 73 (1896); Auriv., *Kongl. Sc. Akad. Handl.* XXXI. 5. p. 238. n. 38 (1899).

♂♀. Body *above* bistre brown in ♂, tawny bistre in ♀, four dots on head, a line behind eye, a dot on pronotum laterally and another on tegula before wing creamy white; *underside* in ♂ creamy buff, breast darker at sides, palpi cream colour, in ♀ clay colour.

♂. *Wings, above* blue-black, glossy blue in side-light, with greenish reflections on hindwing.—Forewing: a discal and a postdiscal series of purplish blue spots,

spots  $M^2$ — $SM^2$  merged together to a large patch as in *Ch. smaragdalis butleri*, concave distally, measuring about 8 mm. upon ( $SM^1$ ), contiguous with a broad streak at internal margin, which reaches almost end of  $SM^2$ ; discal spots  $SC^5$ — $R^3$  elongate, separated by the blue-black veins, spot  $R^1$ — $R^2$  the longest, spots  $R^3$ — $M^2$  shorter and broader, convex proximally, somewhat concave distally; postdiscal spots  $R^2$ — $M^2$  triangular, concave distally, pointed proximally, spot  $M^1$ — $M^2$  joined to the discal one between veins, spot  $R^3$ — $M^1$  nearly reaching discal one, postdiscal spots  $SC^5$ — $R^2$  somewhat smaller, not distinctly triangular, spot  $SC^4$ — $SC^5$  the smallest, somewhat white in centre.—Hindwing: a purplish blue disco-postdiscal band of seven patches, all separated from one another by the blue-black veins, all concave distally, the posterior ones joined along the veins to the blue admarginal spots as in *Ch. smaragdalis smaragdalis*; length of patches C— $M^1$  between veins 4, 8, 10, 10, 9 mm. respectively, patches  $M^1$ —( $SM^1$ ) reaching base of  $M^2$ ; submarginal dots as in *smaragdalis*, blue, partly with minute white centres.

*Underside*, distal part of discal interspaces, postdiscal and submarginal interspaces of forewing bistre, rest of forewing and submedian, postdiscal, submarginal, and proximal portion of discal interspaces of hindwing of a peculiar bluish grey colour. Forewing: cell-bars similar to those of *Ch. smaragdalis*, bar 4 deeply incurved in costal half, upper end pointing distad; bar D rather heavy; submedian bars  $M^1$ —( $SM^1$ ) concave proximally, nearly touching each other, bar  $M^1$ — $M^2$  just distal of base of  $M^1$ ; median bars  $SC^3$ — $R^3$ , 3 mm. from cross-veins at  $R^2$ , bars  $R^3$ — $SM^2$  concave distally, contiguous, bar  $R^3$ — $M^1$  6 mm. from base of  $M^1$ ,  $3\frac{1}{2}$  to 4 mm. from bar D, bar  $M^2$  ( $SM^1$ ), 5 to 7 mm. from bluish grey postdiscal lunule at ( $SM^1$ ); discal bars obsolete, last ones vestigial, their outer borders rather clearly defined on account of the postdiscal bluish grey interstitial half-moons; postdiscal bars  $M^1$ — $SM^2$  represented by black patches.—Hindwing: costal subbasal and submedian bars joined together in front to a half-ring, the costal submedian bar standing in front of the subbasal bar C— $SC^2$ ; cell-bar 4 curving basad posteriorly, joining (or nearly so) cell-bar 2; median bars olivaceous, thin, posterior ones partly obsolete, costal one not or very little more basal than bar C— $SC^2$ , bars  $SC^2$ — $R^1$  and  $R^2$ — $R^3$  a little more basal than  $R^1$ — $R^2$ ; submarginal dots black; tails short and blunt.

♀. *Wings, above*.—Forewing: brownish black, base and internal marginal area burnt umber; a broad, white, oblique band from middle of costal margin to  $SM^2$ , 15 mm. wide between  $M^1$  and  $M^2$ , 6 mm. before  $R^1$ , its inner edge irregular, outer edge indented upon and between veins, between  $M^2$  and  $SM^2$  the band nearly reaching margin of wing, the white scaling almost surrounding a large postdiscal, black patch, which is sometimes divided at ( $SM^1$ ); two, rather large, white postdiscal spots  $SC^4$ — $R^1$ , followed by traces of one or two more.—Hindwing: raw umber, darker towards base, clayish cream colour at anterior angle, fringe clayish creamy, more extended brown at ends of veins  $R^2$  to  $SM^2$ ; a complete series of blue submarginal spots, centred white, placed in ovate, postdisco-submarginal, black patches, which are separate, and of which the second is the largest, measuring 7 mm. in length, these patches pointed distally and proximally; admarginal line very heavy between veins.

*Underside*.—Forewing: basal area very pale olive, more grey at the bars; white band as above, but extending to outer margin at internal angle, including the two postdiscal, black patches  $M^2$ — $SM^2$ ; median row of bars at inner edge of band more oblique than in ♂; postdiscal spots  $R^1$ — $M^1$  bluish white, well marked,



the last one merged together with the band; postdiscal spots  $SC^4-M^1$  olive, bordered distally by clayish grey arches, spots  $M^1-SM^2$  black.—Hindwing: nearly as in ♂, submedian interspaces and proximal portions of discal interspaces pearly grey, discal bars obsolete, except the last, postdiscal interstitial lunules bluish grey, bordered distally by the more or less obsolete, brown, postdiscal uniform bars; submarginal brown spots transverse, preceded by a series of white, submarginal, transverse, spots: admarginal line thinner than above, extreme edge of wing clay colour; tail  $R^3$  blunt, second tail a short, blunt, tooth.

Length of forewing: ♂, 43—44 mm.

“ ” ♀, 49 mm.

*Hab.* St. Thomé. In the Tring Museum 1 ♂, 1 ♀, received by Felder from Dr. Staudinger, and 2 ♂♂ collected by A. Mocquerys in October and November 1899.

A very interesting insect, a representative of *Ch. tiridates* resembling, in the pattern of the upperside of the ♂, *Ch. smaragdalis*.

### 36. *Charaxes tiridates*.

- ♂. *Papilio Eques Achirvus tiridates*, Cramer, *Pap. Exot.* II. p. 100. t. 161. f. A. B (1777) (“Java,” “Amboina,” loc. err.); Goeze, *Ent. Beytr.* III. 1. p. 87. n. 68 (1779); Fabr., *Spec. Ins.* II. p. 11. n. 43. (1781) (“Amboina” loc. err.); id., *Mant. Ins.* II. p. 6. n. 47 (1787); Jabl. & Herbst, *Naturs. Schmett.* IV. p. 55. n. 150. t. 62. f. 3. 4 (1790) (“Amboina,” “Brasilien” loc. err.); Gmel., *Syst. Nat.* I. 5. p. 2235 n. 300 (1790) (“Amboina” loc. err.).
- ♂. *Papilio Nymphalis Phaleratus tiridates*, Drury, *Illustr. Exot. Ins.* III. p. 31 & Index t. 23. f. 1. 2 ♂ (1782) (“Brazil” loc. err.).
- ♂. *Papilio Nymphalis tiridates*, Fabricius, *Ent. Syst.* III. 1. p. 62. n. 195 (1793) (“Amboina” loc. err.).
- ♀. *Papilio Nymphalis marica* Fabricius, *l.c.* p. 113. m. 346 (1793) (Africa, Mus. Banks).
- ♂. *Papilio tiridates*, Donovan, *Ins. of India* t. 23. f. 3 (1800) (“Amboyna” loc. err.).
- ♂. *Eriboea tiridatis* (!), Hübner, *Verz. bek. Schmett.* p. 47. n. 429 (1816–27).
- Nymphalis tiridates*, Godart, *Enc. Méth.* IX. p. 354. n. 14 (1823) (“Java,” “Amboina,” loc. err.); Lucas, *Hist. Nat. Lep. Ex.* p. 119. u. 62. f. 2 (1835) (“Java,” “Amboina,” loc. err.); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 308. n. 11 (1850) (Ashanti); Trim., *Rhop. Afr. Austr.* p. 172. n. 99 (1862) (“Moselekatze’s country” loc. err.); Kirby, *Cat. Diurn. Lep.* p. 269. n. 26 (1871) (Africa); Mabille, *Bull. Soc. Zool. France* I. p. 280 (1876) (Congo; Gaboon).
- ♀. *Papilio marica*, Donovan, *Nat. Reposit.* II. t. 37. f. 2 (1834) (Africa).
- Charaxes tiridates*, Thon., *Naturg. Schmett.* p. 73. t. 36. f. 543. 544. ♂. (1837) (“Java,” “Amboina,” loc. err.); Doubl., *List. Spec. Lep. Ins. Brit. Mus.* I. p. 111 (1844) (Ashanti; Congo); Butl., *Proc. Zool. Soc. Lond.* p. 629. n. 28 (1865) (Sierra Leone; Ashanti; ♂ = *tiridates*, ♀ = *marica*); id., *Cat. Diurn. Lep. descr. Fabricius* p. 52. n. 8 (1869); Druce, *Proc. Zool. Soc. Lond.* p. 412. n. 7 (1875) (Angola); Plötz, *Stett. Ent. Zeit.* XLI. p. 194. n. 103 (1880) (Abo, January); Staud., *Exot. Tagf.* p. 170. t. 59. ♂ (1886) (Guinea; Angola; Fernando Po); Dewitz, *Nov. Act. Leop. Car. Ak. Naturf.* L. 4. p. 371 (1887) (Jan., Feb., April, S. of Congo, Mukenge); Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 125. n. 67 (1889) (Kassai); id., *l.c.* p. 146. n. 81 (1889) (Congo); Smith, *Proc. Zool. Soc. Lond.* p. 472. n. 88 (1890) (Aruwimi); Godm. & Salv., in Jameson, *Story Rear Col.* p. 440. n. 82 (1890) (Aruwimi); Auriv., *Ent. Tidskr.* XII. p. 215. n. 141. (1891) (Cameroons); Butl., *Proc. Zool. Soc. Lond.* p. 649. n. 24 (1893) (L. Mweru); Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 191. n. 54 (1893) (Togo); Sharpe, *Proc. Zool. Soc. Lond.* p. 341. n. 49 (1894) (Uganda, 4000 ft., June); Auriv., *l.c.* XV. p. 311. n. 193 (1894) (N’Dian, Bonge, III. v. XI.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 377. n. 77 (1896) (pt.; S. Leone; Accra; Lake Mweru; Ashanti; Isubu); Auriv., *Kongl. Sv. Vet. Akad. Handl.* XXXI. 5. p. 239. n. 43 (1899) (pt.; Sierra Leone to Angola, Lake Mero and Uganda).
- Charaxes tiridates* var. *mixtus* Butler (*nou* Rothschild), *l.c.* (1896) (♀, not ♂).

♂♀. *Body above*: olive black in ♂, with a faint blue tint; head, pronotum and anterior part of mesonotum more or less mummy brown; tawny olive in ♀; four dots on head, a line behind eye and a dot laterally on collar creamy buff;

*underside* clayish cinnamon, sides of breast more bistre, palpi pale clay-colour, mostly with a vestige of a white line near eye, abdomen of ♂ varying from creamy buff to clay colour.

♂. *Wings above*: blue-black, basal half of forewing and basal two-thirds of hindwing with a strong blue gloss.—Forewing: two series of small pale blue spots; the discal series oblique, consisting of the four spots  $R^1-M^2$ , often followed by a fifth spot  $M^2-(SM^1)$ , spot  $M^1-M^2$  seldom absent, often obliquely halfmoon-shaped, spots  $R^1-R^2$  linear, spot  $R^2-R^3$  rounded, both 1 to 2 mm. from cell, sometimes there is a thin linear spot before  $R^1$ , spot  $R^3-M^1$  more distal, rounded or halfmoon-shaped, postdiscal series complete, upper spot white, mostly larger than the other, the series first convex, then concave, and straight from  $M^1$  to  $SM^2$  or internal margin last spot often wanting, spot  $(SM^1)-SM^2$  also often absent; a complete series of pale ochreous marginal spots, well defined, spots  $R^2-M^2$  transverse, luniform, the others shorter, dot  $SC^4-SC^5$  often vestigial.—Hindwing: a postdiscal series of seven pale blue spots, all separate, the series biconcave, the second spot farthest from outer margin, distance 10 to 14 mm., the last spot closest to margin, spot  $C-SC^2$  rounded, generally the largest of all, diameter  $1\frac{1}{2}$  mm., the other more or less halfmoon-shaped; a complete series of submarginal spots, parallel to outer margin, the spots more or less rounded, blue, centred white, white centres of upper spots often absent; admarginal interstitial spots pale ochraceous, sharply defined, luniform, interrupted or constricted at internervular folds, well separated from one another, often buffish near veins; edge of wing and fringe buffish white between veins.

*Underside*: olive cinnamon, varying a little in the depth of the tints, forewing mostly more yellowish than hindwing.—Forewing: borders of bars bluish white, rather thin; basal cell-bar often vestigial, bar 2 straight, 3 curved, sometimes interrupted, often  $1\frac{1}{2}$  mm. broad, bar 4 convex in middle and concave in costal half, upper end sometimes dilated basad along SC, forming a sharp hook; bar D complete; submedian bars  $M^1-(SM^1)$  1 to 3 mm. distant from one another, bar  $M^1-M^2$  just proximal of base of  $M^1$ , seldom distal of it; median bars  $R^1-R^3$  1 to 2 mm. from cross-veins, not or little thicker than bar D, median bars  $R^3-SM^2$  in an oblique row, continuous, or almost so, all curved, bars  $M^2-SM^2$  fused to a somewhat 3-shaped mark which often touches posteriorly discal bar  $M^2-SM^2$ ; discal bars  $M^1-SM^2$  thin, black, regularly arched, the other discal bars vestigial or absent, contiguous with postdiscal interstitial halfmoons of which the posterior ones are well defined and clayish gallstone yellow, uppermost white, more rounded, second also often whitish; postdiscal bars  $M^2-SM^2$  represented by two large black patches which are bordered very pale blue distally, the blue border resembling the number 3, postdiscal patch  $M^1-M^2$  smaller, olive black, more or less indistinctly bordered pale blue, the other postdiscal patches vestigial, not or little darker than the ground colour, but often rendered more obvious on account of the paler clayish buff borders; margin with indistinct clayish buff spots; cell, submedian interspaces and proximal portions of discal colours pale clayish wax-yellow.—Hindwing: bars thinner than on forewing; basal costal bar not touching PC,  $1\frac{1}{2}$  mm. distant from it, mostly straight, seldom curved and pointing distad; subbasal costal bar bordering PC joined together with costal submedian bar to form a half-ring; costal submedian bar in front of subbasal bar  $C-SC^2$ ; cell-bars 2 and 4 mostly joined together behind, as are often subbasal and submedian bars  $C-SC^2$  in front; costal median bar in front of median bar  $C-SC^2$ , which is S-shaped, or very little more proximal, median bar  $SC^2-R^1$  arched,  $1\frac{1}{2}$  to 3 mm. more proximal than bars  $C-SC^2$ , and

$R^1-R^2$ , bar  $R^2-R^3$  arched, about 1 mm. from base of  $M^1$ , bars  $R^3-SM^2$  nearly continuous, crossing  $M^1$  about 3 to 4 mm. from base; discal bars all regularly arched, only the posterior ones well marked, the others obsolete or absent, but the white distal borders more or less preserved, postdiscal bars represented by olive brown, ill-defined, patches, but bars  $M^1-SM^2$  thin and arched, sometimes tawny olive, but mostly black; submarginal dots white and blue, followed by black dots, upper black dots absent from most specimens; admarginal interspaces occupied by creamy buff spots, which are generally shaded in middle by olive buff; admarginal line fuscous, forming lunules between veins; submedian interspaces and small patches at outside of median bars pale clayish wax yellow; tails pointed, upper one 3 to  $5\frac{1}{2}$  mm. long, second 2 to 3 mm.

♀. *Wings above*: pale tawny olive.—Forewing: apical half blackish brown, with a purplish sheen in side-light, variable in the depth of the brown tint; a white, oblique, posteriorly slightly curved, discal band crosses wing from costal margin to  $SM^2$ , generally well separated by the veins into patches, patch  $R^1-R^2$  about 10 mm. long, patches  $R^3-SM^2$  more or less sinuate distally, patch  $M^1-M^2$  very oblique proximally, patches  $M^2-SM^2$  much smaller, often much shaded with tawny olive, the patches more or less heavily bordered blackish brown proximally, upper angle of cell also blackish brown; a postdiscal series of two larger white spots followed by four indistinct tawny olive ones, spot  $M^1-M^2$  contiguous with the white band; marginal spots much less obvious than in ♂, in most individuals the last two alone well marked.—Hindwing: median bar  $C-SC^2$  generally marked, with a white patch at outside, white is seldom obsolete; a postdisco-marginal band of the colour of the apical area of the forewing, bordered proximally by a series of more or less vestigial clayish spots which correspond to the blue postdiscal spots of the ♂, the band convex between veins proximally, wider in front than behind; within it we find a series of purplish blue submarginal spots, mostly with white centres, and a series of clayish buff, transverse, spots, constricted or interrupted at the internervular folds; extreme edge clayish between veins, fringe white, except at ends of veins.

*Underside*: similar to ♂. Black bars of forewing heavier, median bars more oblique, bar  $R^3-M^1$  more straight, generally at right angles to  $M^1$ , seldom touching upper end of oblique bar  $M^1-M^2$ ; band less interrupted at veins than on *upper side*; discal bar  $M^2-SM^2$  often obsolete; black postdiscal patches  $M^1-SM^2$  smaller than in ♂. Upper tail of nearly even width, not pointed,  $7\frac{1}{2}$  to 9 mm. long, second 2 to 4 mm.

Length of forewing: ♂, 44–52 mm.

“ “ ♀, 48–58 mm.

Clasper not essentially different from those of the allied species, upper edge irregularly notched and dentated before tip (Pl. VIII., f. 26); penis with a single dorsal tooth 1 mm. before tip (Pl. VIII., f. 7) and a rather high dorsal ridge about  $2\frac{1}{3}$  mm. before apex, the ridge variable in outline.

*Hab.* From Sierra Leone to Angola and British East Africa and (according to Butler) Brit. Central Africa; not in the coast regions of East Africa, nor in South Africa; a common insect. In the Tring Museum 70 ♂♂, 20 ♀♀ from: Sierra Leone; Accra; Coomassie; O. Calabar; Cameroons; Gaboon and Ogowe; Congo: Stanley Pool, Lukolele, Bopoto, Kassai; Aruwimi Forest (Dr. Ansorge); Unyoro (Dr. Ansorge); Warringo R., 9. vii. 97, Kaligire, 5. i. 98, Fajao, 18. vii. and 10. xii. 97; Uganda Protectorate (Dr. Ansorge): Itan, Nandi country, March 1898.



A ♂ from Cameroons in Mr. Grose-Smith's collection has no admarginal spots on the upperside of the hindwing.

Boisduval, in Delegorgue  *Voy. Afr. Austr.* II. p. 593, records *tiridates* from the country of Moselekatze (Zululand), in which he was wrong; the specimens were either wrongly located, or they belonged to another species (*xiphares* or *cithaeron*).

### 37. *Charaxes bipunctatus*.

*Charaxes bipunctatus* Rothschild, Nov. Zool. I. p. 536. n. 4 (1894) (Gold Coast ?) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 378. n. 78 (1896) (Accra) ; Auriv., *Kongl. Sv. Akad. Handl.* XXXI. 5. p. 240. n. 44 (1899) (Ashanti).

♂. Closely resembling *Ch. tiridates*. *Wings above*, strongly purplish.—Forewing : outer margin on the whole less concave than in *tiridates* ; discal spots small, two to five in number, postdiscal series represented by one small, bluish white, spot SC<sup>1</sup>—SC<sup>5</sup> only, which is sometimes followed by traces of a second, blue, spot ; marginal spots as in *tiridates*, but less well defined, being shaded with black.—Hindwing : postdiscal series of spots represented by two rounded dots C—R<sup>1</sup>, variable in size, followed sometimes by a third, vestigial, spot ; submarginal dots smaller than in *tiridates* ; admarginal interstitial markings ochreous buff, prominent, slightly shaded with blue upon internervular folds, but not obviously interrupted.

*Underside* more uniformly dark cinnamon than in *tiridates* and *mixtus* ; median bars of forewing as in *tiridates*, bars M<sup>2</sup>—SM<sup>2</sup> mostly merged together to a rather regularly curved halfmoon ; costal submedian bar of hindwing and median bar SC<sup>2</sup>—R<sup>1</sup> more or less straight, submedian and subbasal bars farther apart than in *tiridates*, not curving towards one another at C and M ; tails reduced to two short teeth.

♀. Similar to ♀ of *tiridates* ; submarginal blue and white dots of hindwing minute, admarginal buff markings prominent, as in ♂, not divided at the internervular folds.

*Underside* as in ♂, bars of hindwing thinner than in *tiridates* ; white band as above, discal bar M<sup>2</sup>—SM<sup>2</sup> absent ; tails reduced to short teeth.

Length of forewing : ♂, 44—45 mm.

“ “ ♀, 47—48 mm.

Clasper rather broader at tip than in *tiridates*, the hook somewhat different in outline (Pl. VIII. f. 28.) ; the penis has the subapical tooth sinistro-lateral, as in *mixtus*, but rather more ventral, the dorsal ridge reduced to a heavy tooth (Pl. VIII. f. 9.).

*Hab.* Gold Coast to Aruwimi Forest. In the Tring Museum 6 ♂♂, 2 ♀♀ from : Kumassi to Cape Coast Castle, iv. 99 (Capt. Gifford) ; Lukolele to Stanley Pool (Harrison) ; 2 and 3 days' march from Ft. Beni, great forest of Upper Congo, 6. and 7. v. 99 (Dr. Ansorge) ; Gold Coast (?).

### 38. *Charaxes mixtus* (Nov. Zool. V. t. 6. f. 1. ♀).

*Charaxes mixtus* Rothschild, Nov. Zool. I. p. 536. n. 3. t. 12 f. 8. ♂ (1894) (Lukolele).

*Charaxes tiridates* var. *mixtus*, Butler, *Journ. Linn. Soc. Lond.* XXV. p. 377. sub n. 77 (1896) (pt. ; ♂, not ♀ ; Victoria, Cameroons) ; id., *Ann. Mag. N. H.* (6). XIX. p. 124. (1897) ; Auriv., *Kongl. Sv. Akad. Handl.* XXXI. 5. p. 239. sub n. 43 (1899) (Cameroons ; Lukolele and Katanga, Congo).

The specific distinctness of this insect has been doubted. Messrs. Butler and Aurivillius treat it as a “ var.” of *tiridates*, which term Aurivillius employs for



geographical forms. *Ch. tiridates* and *mixtus*, however, occur together ; therefore *mixtus* is not a geographical representative of the common *tiridates*. It can also not be a mere individual aberration, because (1) the differences in colour are constant, and (2) the sexual organs of the ♂ are different. The most remarkable feature of *Ch. mixtus* is the similarity of the sexes.

♂. Very close to *Ch. tiridates*, but ground colour and markings of *upperside* more purplish, discal series of spots of forewing less oblique, spots  $M^2-SM^2$ , if present, not so close to postdiscal series, upper two spots of postdiscal series white, marginal spots dirty cream colour, square, situated upon the internervular folds ; postdiscal spot  $C-SC^2$  of hindwing much smaller than spot  $SC^2-R^1$ , posterior three or four postdiscal spots often nearly contiguous, sometimes there is a discal spot  $C-SC^2$  present, submarginal dots smaller than in *tiridates*, white edged with blue, or blue, admarginal spots blue, upper ones often creamy at veins, not interrupted.

*Underside* darker olive, less yellowish, than in *tiridates*, outer marginal area shaded with grey, bars of forewing on the whole thinner, median bars  $R^3-SM^2$  less oblique, bars  $M^2-SM^2$  forming a more regularly W-shaped mark, which, moreover, is more proximal than in *tiridates* ; submedian costal bar of hindwing mostly straight, often pointing distad, sometimes curved to PC, no subbasal costal bar at outside of PC.

♀. Like ♂, larger ; blue postdiscal spots of forewing very small, admarginal spots absent, except spots  $M^2-SM^2$  which are blue.

Length of forewing : ♂, 43—51 mm.

” ” ♀, 57 mm.

Clasper slenderer than in *Ch. tiridates*, the hook longer (Pl. VIII. f. 27.) ; penis similar to that of *tiridates*, but the ridge very much redned (Pl. VIII. f. 8.) and the subapical tooth sinistro-lateral, not dorsal ; penis-funnel broader and blunter than in the allied species.

*Hab.* Congo and Cameroons. In the Tring Museum 7 ♂ ♂ from : Stanley Pool to Lukolele, Congo (Revs. Harrison and Clarke) ; a ♀ in the Berlin Museum from Cameroons.

*d*<sup>1</sup>. Median bars  $SC^3-R^2$  of forewing below in normal position, 6 to 9 mm. from cell.

*e*<sup>2</sup>. Hindwing above without large admarginal patches.

*g*<sup>3</sup>. Cell-bars of forewing below black and thin, bar 3 interrupted, or rufous chestnut.

*e*<sup>4</sup>. Cell-bars black.

*c*<sup>5</sup>. Hindwing below without straight rufous chestnut band across disc.

*c*<sup>6</sup>. Abdomen olive black above.

*c*<sup>7</sup>. ♂, cell of forewing above with blue patch ; ♀, band of hindwing white, or bluish only at edges.

### 39. *Charaxes ameliae*.

*Charaxes ameliae* Doumet, *Rev. Zool.* (2). XIII. p. 171. t. 5. f. 1. ♂ (1861) (Gaboon) ; Butl., *Proc. Zool. Soc. Lond.* p. 630. n. 30 (1865) (Gaboon ; S. Leone) ; Hew., *Ex. Butl.* V. *Charaxes* t. 5. f. 20. 21. ♀ (1876) (O. Calabar) ; Dewitz, *Nov. Act. Leop. Car. Ak. Naturf. L.* 4. p. 371 (1887) (S. of Congo, January) ; Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 125. n. 68 (1889)

(Kassai : Congo) ; Auriv., *Ent. Tidskr.* XII. p. 215. n. 142 (1891) (*regius*=*ameliae*) ; Schaus & Clements, *Sierra Leone Lepid.* p. 9 (1893) ; Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 192. n. 55. (1893) (Adeli, Togo) ; Auriv., *l.c.* XV. p. 310. n. 191 (1894) (Ekundu, N'Dian, Cameroons, March) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 374. n. 68 (1896) (S. Leone ; Cameroons ; O. Calabar ; Accra) ; Auriv., *Kongl. Sv. Ak. Handl.* XXXI. 5. p. 240. n. 47 (1899) (S. Leone to Congo).

*Nymphalis ameliae*, Kirby, *Cat. Diurn Lep.* p. 270. n. 28 (1871) (Afr. occ.).

*Charaxes regius* Aurivillius, *Ent. Tidskr.* X. p. 191 (1889) (Cameroons).

♂ ♀. *Body above* : olive black in ♂, blackish sepia in front, in ♀ bistre brown, thorax more olive, white dots on head and pronotum conspicuous ; *underside* cream colour, sides of breast and legs more grey, abdomen of ♀ clayish buff, seldom drab.

♂. *Wings above* : velvety blue-black, markings pale small blue appearing pearl blue or purplish in side-light.—Forewing : anterior half or two-thirds of the basal thirds of the cell occupied by a triangular patch which is 3 mm. broad at the slightly sinuated apex and includes mostly a black dot at two-thirds of its length (the black dot corresponding to upper part of cell-bar 3 of *underside*), costal margin more or less pale blue (upper layer of scales), except in apical third ; a subrectangular patch  $R^2$ — $R^3$  just beyond apex of cell, about 3 mm. long, three more discal spots between  $SC^4$  and  $R^2$  about 8 mm. from cell, the first of them linear, thin, the second more or less rectangular, about 3 mm. long and  $1\frac{1}{2}$  mm. broad, the third linear, often absent ; a postdiscal series of eight spots, almost straight from  $R^1$  to internal margin, spot  $R^1$ — $R^2$  4 mm. distant from outer margin, last spot 9 mm., first spot more proximal, 10 mm. from apex of wing, the spots gradually increasing in size towards internal margin, spot  $R^1$ — $R^2$  the smallest, about 1 mm. wide, spot  $M^2$ — $SM^2$  the largest, about 4 mm. long and  $2\frac{1}{2}$  broad, that at internal margin often longer ; a streak of 8 to 11 mm. length at base before  $SM^2$  ; a series of small admarginal dots, dots  $M^2$ — $SM^2$  well separated.—Hindwing : a discal series of patches, as continuation of the postdiscal series of the forewing, extends from  $C^2$  to ( $SM^1$ ), forming a band which is interrupted at  $R^1$  and incised distally upon  $R^2$ , the band very variable in width, widest behind, extending into apex of cell, patch  $SC^2$ — $R^1$  more or less rounded, a postdiscal patch  $C$ — $SC^2$ , occasionally reduced to a small lunule, a little more distal than patch  $SC^2$ — $R^1$ , seldom with a discal patch at proximal side ; a series of eight submarginal spots parallel to outer margin, barely 2 mm. distant from it, the spots rounded, of about equal size, diameter  $1\frac{1}{2}$  to 2 mm., spots  $M^2$ — $SM^2$  seldom contiguous ; a series of admarginal bars, dilated distad at ends, slightly constricted in middle, almost continuous from  $R^2$  to anal angle, spots  $C$ — $R^1$  seldom vestigial ; abdominal fold hair brown, seldom uniform in colour, mostly edged with creamy buff, or assuming a white buff tint beyond end of  $SM^3$ , the long hairs before the fold brownish black, with a chocolate hue, the bases of the hairs paler.

*Underside* : olivaceous wood brown, with a yellowish tint, shaded with eern drab on hindwing, white borders of black bars slightly bluish.—Forewing : no basal cell-spot, cell-bar 2 curved, bar 3 interrupted into a larger posterior and smaller anterior spot, bar 4 distally convex in middle and concave near both ends, but more obviously so in upper half ; subbasal bar  $M^2$ —( $SM^1$ ) sometimes represented by a spot ; submedian bar  $M^1$ — $M^2$  just behind, or a little proximal of, base of  $M^1$ , bar  $M^2$ —( $SM^1$ ) about 2 mm. more proximal, both generally at right angles to veins ; median bars  $R^3$ — $M^2$  slightly concave distally, bar  $R^3$ — $M^1$  5 mm. from base of  $M^1$ , bar  $M^1$ — $M^2$  about 2 mm. more proximal, bar  $M^2$ — $SM^2$  more straight, generally triangularly dilated proximally upon ( $SM^1$ ), again 2 mm. more proximal than bar  $M^1$ — $M^2$ , at right angles to  $M^2$ , median bar  $R^2$ — $R^3$  touching bar D at lower

angle of cell, bars  $SC^5-R^2$  mostly concave proximally, 8 mm. from cell, ground of wing at outer side of median bars greyish or ecru drab, bluish grey between  $M^2$  and  $SM^2$ , this pale scaling forming ill-defined patches; discal series of bars represented by two black lunules between  $M^1$  and  $SM^2$ , the other discal bars seldom vestigial; postdiscal bars  $M^1-SM^2$  developed to two large black patches, patch  $M^2-SM^2$  incised outwardly upon ( $SM^1$ ), both patches bordered outwardly by very pale blue scaling, border of double patch  $M^2-SM^2$  extending basad to near the discal bars, resembling the number 3, the other postdiscal patches obsolete, but their pale outer borders fused with the postdiscal, luniform, pale interspaces to more or less complete rings, postdiscal interspaces  $M^1-SM^2$  wax yellow; submarginal bars  $M^1-SM^2$  generally vestigial.—Hindwing: paler than forewing, bars thinner; basal costal bar short, curved, reaching PC at or before angle of this vein; subbasal costal bar absent, subbasal bars C—M continuous; submedian costal bar a little more proximal than the other submedian bars, these almost continuous down to ( $SM^1$ ), the bars almost straight, submedian interspace ecru drab, nearly white; median bars nearly continuous, standing in an almost straight line which crosses M at base of  $M^1$ , proximal half or two-thirds of discal interspaces occupied by a distally ill-defined band of ecru drab colour; discal bars thin, mostly vestigial or absent, bordered by white lunules at outer side, bars  $SC^2-R^1$  and  $R^3-M^1$  much more proximal than the others; postdiscal bars also curved, generally vestigial, seldom quite absent; postdiscal interspaces varying from tawny olive to olive buff; submarginal black dots vestigial between  $R^2$  and  $SM^2$ , last two always present, minute, the white submarginal dots also more or less vestigial; admarginal interspaces olive tawny, mostly bluish white at veins; submarginal and abdominal areas ecru drab; tails pointed, upper one  $2\frac{1}{2}$  to 5 mm. long, second a short tooth.

♀. *Wings, upperside*: burnt amber colour in basal area, outer area more blackish, especially on hindwing, with a purplish tint.—Forewing: three series of spots, cream colour or white; four discal patches from  $R^3$  to internal margin, patches  $R^3-M^2$  isolated, oblique, convex proximally, often concave distally, patch  $M^2-SM^2$  triangularly sinuate proximally at ( $SM^1$ ), about 4 mm. broad at  $M^2$ , often with pale blue scaling at proximal, less often at distal, edge, contiguous with long patch at internal margin, discal patch  $R^2-R^3$  close to cell, spots  $SC^4-R^2$  halfway between cell and postdiscal series, spot  $SC^4-SC^5$  thin, linear, the two others about 4 mm. long, all separated, placed in an oblique row, proximal edge of spot  $SC^5-R^1$  2 to 4 mm. more distal than proximal edge of spot  $R^1-R^2$ ; postdiscal spots nearly placed as in ♂, but second and third farther from margin, spot at internal margin, if present, fused with the discal patch, postdiscal spots more yellowish distally than proximally or all white; admarginal spots small, all separate, nearly touching fringe.—Hindwing: a milky white discal band, about 6 mm. broad in front, tapering behind, reaching abdominal margin at a distance of 4 mm. from end of  $SM^2$ ; basally the band is bordered by pale blue scaling between  $SC^2$  (or  $R^1$ ) and ( $SM^1$ ), this scaling consisting of the upper layer of scales extends basad as far as origin of  $M^2$  or a little farther down, distally the band has a narrower pale blue border; between C and  $R^1$  or  $R^2$  there are mostly two or three white postdiscal spots more or less distinctly separated from the white band; a series of white submarginal spots edged with pale blue, upper three white spots the longest, but the posterior spots have wider blue borders; admarginal interstitial spots transverse, triangularly dilated distad at veins, creamy at veins, buff in middle, anal one thin, blue.

*Underside*: more yellowish than in ♂, white markings better defined,

abdominal area of hindwing not ecru drab.—Forewing: white discal patches larger than above, postdiscal spots  $SC^1-M^1$  rounded, with indications of the discal bars at the proximal, and of the postdiscal bars at the distal side.—Hindwing: white discal band seldom touching discal bars  $C-R^1$ , generally widely separated from them; submarginal area ecru drab or white only distally, white submarginal spots rather large, but not well defined, white dots  $M^2-SM^2$ , however, minute; admarginal interspaces more or less gallstone yellow except distally near veins; upper tail 5 to 8 mm. long, second 3 mm.

Length of forewing: ♂, 38—48 mm.

“ ” ♀, 42—54 mm.

Clasper longer than in *tiridates* and allies, the hook longer and more gently curved; penis armed with a tooth 1 mm. before end, more or less obviously grooved longitudinally before the tooth, a very feebly raised, long, ridge 3 mm. before end; penis-funnel broad, blunt, if viewed from above, apical hook broad at base but sharply pointed.

*Hab.* Sierra Leone to the Upper Congo and Nyassaland. In the Tring Museum 35 ♂♂, 19 ♀♀ from: Sierra Leone; Gold Coast; Shabo country, Niger, February 1895 (Dr. Roth); Calabar; Bopoto, Congo; Kassai, Aruwimi forest, three and ten days' march from Ft. Beni, 7. and 14. v. 99 (Dr. Ansorge); Bandawe, Nyassaland, April (F. Watkinson).

The *females* from Nyassaland have the discal spots of the forewing above all white, while in the specimens from Sierra Leone and Gold Coast they are more or less cream colour, at least the upper discal ones. This difference, however, is not constant, as there occur in West Africa, together with cream-spotted specimens, individuals which do not apparently differ from the Nyassaland examples.

In a ♂ from the Kassai country, Congo basin, the cell-bar 3 of the hindwing below is indicated by a black dot.

*d.* ♂ without blue patch in cell of forewing above; ♀ with blue band on hindwing.

#### 40. *Charaxes imperialis* (Nov. Zool. V. t. 6. f. 5. ♀).

*Charaxes imperialis* Butler, *Tr. Ent. Soc. Lond.* p. 531. t. 11. f. 3. ♂ (1874) (Whydab, Gold Coast); Kirby, *Cat. Diurn. Lep.* p. 748. n. 40 (1877) (*imperialis* “Murr.”); Butl., *Proc. Zool. Soc. Lond.* p. 570. n. 26 (1887) (Rio del Rey, ♀); Schaus & Clements, *Sierra Leone Lepid.* p. 9 (1893); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 374. n. 67 (1896) (S. Leone; Rio del Rey); Auriv., *Kongl. Sv. Ak. Handl.* XXXI. 5. p. 240. n. 46 (1899) (S. Leone; Ashanti; O. Calabar; Bena-Bendi, Congo).

♂ ♀. Body as in *Ch. ameliae*.

♂. *Wings above* velvety black, greenish blue in side-light, slightly glossy at base, especially in cell of forewing.—Forewing: three small, white, discal dots  $SC^5-R^3$ , upper two about 7 mm. from cell, dot  $R^2-R^3$  close to cell; a band of four small, white, postdiscal dots  $SC^4-R^3$ , edged with blue, followed by a larger blue spot, often centred white, and again by three turquoise blue discal patches between  $R^3$  and internal margin, which gradually increase in width, patch at internal margin about 5 mm. long, patch  $M^2-SM^2$  proximally sinuate at ( $SM^1$ ), the series straight from internal margin to  $R^1$ , then curving costad; minute blue admarginal dots, sometimes absent except dots  $M^2-SM^2$ ; fringe restricted white between veins; apex of wing rather acute.—Hindwing: a turquoise blue discal band from  $SC^2$  to ( $SM^1$ ) as a prolongation of the band of the forewing, about 5 to



7 mm. broad, obliquely cut off posteriorly, preceded by a white discal spot C—SC<sup>2</sup>, edged with blue, and a blue postdiscal spot, the former sometimes vestigial; submarginal spots turquoise blue, upper two the largest, diameter about 1½ mm., more or less rounded, the others more transverse, last two seldom with vestiges of white centres; admarginal spots the same colour, thin, interrupted between veins, spot C—SC<sup>2</sup> always, the following one or two sometimes absent; abdominal fold grey or clayish grey near margin.

*Underside* olive wood brown, tinged with tawny olive, with a bluish olive grey gloss in side-light, subbasal to median bars thinly bordered with bluish grey at both sides.—Forewing: basal cell-bar seldom indicated by a dot, cell-bars 2 to 4 nearly equal in thickness, barely ½ mm. broad, bar 3 mostly interrupted, bar 4 convex distally in middle, concave in upper half; submedian bar M<sup>1</sup>—M<sup>2</sup> proximal of base of M<sup>1</sup>, bar M<sup>2</sup>—SM<sup>2</sup> generally angle-shaped, ½ to 1½ mm. more proximal than bar M<sup>1</sup>—M<sup>2</sup>; median bars R<sup>1</sup>—SM<sup>2</sup> one behind the other, not continuous, bars R<sup>3</sup>—M<sup>2</sup> curved, bar M<sup>2</sup>—SM<sup>2</sup> straight or angled upon (SM<sup>1</sup>), the tip of the angle pointing distad, bar R<sup>3</sup>—M<sup>1</sup> often very short, about 6 mm. from base of M<sup>1</sup>, bar R<sup>2</sup>—R<sup>3</sup> 1½ mm. from bar D, bars SC<sup>5</sup>—R<sup>2</sup> 9 mm. from cell, short, thin, bars SC<sup>5</sup>—R<sup>3</sup> with a small white spot at outer side; discal bars M<sup>1</sup>—SM<sup>2</sup> black, thin, curved, the others vestigial or absent, followed by five postdiscal dots between SC<sup>4</sup> and M<sup>1</sup>, white, distally yellowish, bars M<sup>1</sup>—SM<sup>2</sup>, however, with a bluish distal border followed by gallstone yellow, heavy, halfmoons; postdiscal bars M<sup>2</sup>—SM<sup>2</sup> represented by a large double patch, deeply incised distally upon (SM<sup>1</sup>), with pale blue outer border resembling the number 3; bar M<sup>1</sup>—M<sup>2</sup> represented by the vestige of a second patch; outer margin with an indistinct band of 2 mm. width, which is slightly more yellow than the disc; internal margin blackish near angle.—Hindwing: subbasal and submedian series of bars stopping at M, but there is occasionally a minute submedian bar behind M near origin of M<sup>2</sup>; basal costal bar curving distad touching PC at angle of this vein, subbasal costal bar absent, submedian costal bar standing in front of the subbasal bar C—SC<sup>2</sup>, curving distad; median costal bar more proximal than the other median bars, curving basad, sometimes joined to submedian costal bar along costal margin, median bars R<sup>1</sup>—SM<sup>2</sup> in an almost straight row, the row slightly broken at R<sup>3</sup>, bar R<sup>2</sup>—R<sup>3</sup> being about ½ or 1 mm. more proximal than bar R<sup>3</sup>—M<sup>1</sup>, bar C—SC<sup>2</sup> more basal, more or less concave distally, whitish outer border of bar C—SC<sup>2</sup> developed to small white spots, similar but smaller spots often between R<sup>1</sup> and R<sup>3</sup>; discal bars arched, thin, partly obliterated, bluish white distal borders of the upper bars conspicuous; postdiscal bars M<sup>2</sup>—SM<sup>2</sup> black, well marked, the other postdiscal bars vestigial, seldom clearly defined, postdiscal luniform interspaces gallstone yellow, often more olivaceous tawny; white submarginal spots present, last two the smallest, but the best defined, shaded with bluish grey, followed by blue and black dots, except the upper ones; admarginal interstitial bars dilated distad at ends, gallstone yellow, constricted in middle, the distal triangular portions near veins bluish grey; tails acute, upper one 3 to 5 mm., second about 2 mm.

♀. *Wings above* blackish brown, purplish, outer area of hindwing rather deeper in tint than rest of upperside.—Forewing: basal half of costal margin chocolate; three series of spots, a discal series: two spots SC<sup>5</sup>—R<sup>2</sup>, about 9 mm. from cell, the second more distal, often a trace of a spot before SC<sup>5</sup>, a square spot R<sup>2</sup>—R<sup>3</sup> close to cell, four spots R<sup>3</sup>—SM<sup>2</sup>, spot R<sup>3</sup>—M<sup>1</sup> more or less rounded, 8 mm. from base of M<sup>1</sup>, the next a little more proximal, spots M<sup>2</sup>—SM<sup>2</sup> placed into blue patches, a

blue patch also behind  $SM^2$ , these discal spots nearly equal in size, more or less buff, spots  $R^2-R^3$  and  $M^2-SM^2$  more creamy, or all creamy white proximally; a postdiscal series parallel to the discal series behind, anteriorly curving costad, spot  $R^1-R^2$  nearest the margin, the series posteriorly gradually retreating from margin, spot  $M^2-(SM^1)$  vestigial, spot  $(SM^1)-SM^2$  absent, all buff; admarginal spots small, ochraceous buff, not well defined, upper ones obscure: fringe restricted white at internervular folds.—Hindwing: a blue discal band as in ♂, preceded by a large, white, discal patch  $C-SC^2$  and a smaller, postdiscal, buff, patch, the latter often shaded with blue; submarginal spots buff, larger than in ♂, last two minute, white with blue edges, admarginal bars all present, buff, not interrupted.

*Underside* nearly as in ♂, all the median bars of forewing with a dirty white patch at outer side, discal patch  $C-SC^2$  of hindwing and the postdiscal interstitial spots of forewing larger than in ♂; tails triangular, upper one 5 to 8 mm., second 2 to 4 mm. long.

Length of forewing: ♂ 40–45 mm.

” ” ♀ 47–51 mm.

Clasper similar to that of *Ch. tiridates*, slenderer; penis with a tooth 1 mm. before the end and a short tooth-like ridge farther back, nearly as in *Ch. bipunctatus*; penis-funnel very little narrower towards end, being of nearly the same width near base as near extremity, the tip is curved down as in other *Charaxes*, but this ventral portion is broad, not pointed, being rounded triangular.

*Hab.* Sierra Leone to the Congo, rare. In the Tring Museum 9 ♂♂, 4 ♀♀ from Sierra Leone and the Gold Coast, one of them caught at Sierra Leone in October 1898 by Capt. Stevens. In the Berlin Museum from Victoria, Cameroons; in Dr. Standinger's collection a ♂ and a ♀ from Borombi, Cameroons, and a ♂ from the Gold Coast.

In one of the ♂♂ from Sierra Leone there are vestiges of blue discal spots  $R^3-M^2$  on the upperside of the forewing.

Dr. Standinger's ♀ from the Cameroons has the postdiscal spots of the upperside of the forewing much paler than they are in our Sierra Leone examples, and the blue band of the hindwing is wider.

*d*<sup>6</sup>. Abdomen white.

#### 41. *Charaxes pythodorus*.

*Charaxes pythodorus* Hewitson, *Ent. Mo. Mag.* X. p. 57 (1873) (Angola); Auriv., *Kongl. Sr. Ak. Handl.* XXXI. 5. p. 239. n. 39 (1899).

*Charaxes pythodorus* (1) Hewitson, *Ex. Butt.* V. *Charaxes*. t. 5. f. 18. 19. ♂ (1874).

♂. Head, pronotum and anterior part of mesonotum mummy brown, upperside of palpi and meso-metanotum black, the last with white hairs; abdomen creamy white; *underside* of palpi and abdomen buff, sides of sterna and legs clay colour, femora blackish above.

♂. *Wings above* black, slightly blue in side-light.—Forewing: basal half of costal margin chocolate brown, especially the veins, if denuded; discal spots  $SC^5-R^3$  placed nearly as in ♀ of *imperialis*, spots  $SC^5-R^2$  about 8 mm. from cell, small, not so broad as the space between them, spot  $R^2-R^3$  close to cell, spot  $R^3-M^1$  5 to 7 mm. from base of  $M^1$ , these spots white, edged and shaded with pale blue, white spots  $M^1-SM^2$  6 to 7 mm. from base of  $M^1$ , a little larger than

spot  $R^3-M^1$ , placed into a very large pale blue patch which is 12 to 16 mm. broad at internal margin and of which the oblique proximal edge is 9 mm. from base of wing at  $SM^2$ ; a postdiscal series of pale blue spots, curving costad in front, the spots increasing in size behind, rounded, diameter of spot  $M^1-M^2$  1 to 3 mm., spots  $M^2-SM^2$  merged together with the blue area; no admarginal dots, fringe white except at ends of veins.—Hindwing: a large pale blue area from near base to beyond bent of  $R^3$ , shaded with white proximally, becoming almost pure white towards abdominal margin; base for about 4 mm. and postdisco-marginal area black, the latter 10 to 14 mm. broad at  $SC^2$ , 4 to 7 mm. at  $M^2$ ; a series of small, submarginal spots, white, edged and shaded with blue, anterior spot the largest, diameter about  $1\frac{1}{2}$  mm.; admarginal, pale blue, markings very thin, partly obsolete.

*Underside* uniformly buffish clay colour, black bars very thin, except bars  $M^2-SM^2$  of forewing, whitish edges of bars extremely thin.—Forewing: no basal cell-spot, cell-bar 3 separated into two portions, sometimes into three or four dots, cell-bar 4 nearer bar 3 than apex of cell, strongly convex in middle distally, concave near ends; bar D partly obsolete, very thin; submedian and median bars  $M^2-SM^2$  heavy, joined together behind, forming a heavy half-ring, which is sometimes entirely filled up with black, submedian bar  $M^1-M^2$  3 mm. from base of  $M^2$ ; median bars  $R^3-M^2$  concave distally, bar  $R^3-M^1$  7 mm. from base of  $M^1$ , bar  $M^1-M^2$  3 mm. more proximal, median bar  $R^2-R^3$  1 to 2 mm. from cell, mostly straight, less often concave distally, bar  $R^1-R^2$  short, convex distally, 10 mm. from cell, bar  $SC^5-R^1$  about 2 to  $2\frac{1}{2}$  mm. more distal, of the same shape, on the outer side of median bars there are seldom vestiges of white spots; discal bars  $M^2-SM^2$  represented by a black halfmoon, the other discal bars indicated as blackish clouds forming an indistinct, nearly continuous, band; postdiscal bars  $M^2-SM^2$  represented by a large black patch, concave distally, with ill-defined, faint, grey scaling at proximal and distal sides, the other postdiscal bars mostly represented by small, ill-defined, brown or black spots; internal margin black near angle, bluish grey in and beyond middle.—Hindwing: basal costal bar short, sometimes absent; no subbasal costal bar; submedian costal bar more proximal than the other submedian bars, curved or straight; median bars all more or less obviously convex distally, the series more irregular than in *Ch. imperialis*, bars  $SC^2-R^1$  and  $R^1-R^3$  more proximal than the other bars; discal and postdiscal bars represented by brown, more or less distinctly halfmoon-shaped, clouds, the postdiscal ones better defined than the discal ones; bluish white submarginal dots obvious, last two contiguous with blue and black dots; anal angle less produced than in *Ch. imperialis*, tails reduced to short, blunt, teeth.

♀. Like ♂, wings broader. Forewing: outer margin less concave; postdiscal spots more purplish blue, upper discal ones more extended white; on the *underside* the white discal spots at outer side of the median bars present, but small.

Length of forewing: ♂ ♀, 37—45 mm.

Clasper similar to that of *Ch. imperialis*: penis without subapical tooth, armed only with a minute tooth situated about  $3\frac{1}{2}$  mm. from the apex; penis-funnel as in *imperialis*, but the tip of the hook more acute.

*Hab.* From Angola to British East Africa; not occurring north of Congo, or in S. Africa.

*Ch. pythodorus* is a sexually monomorphic southern ally of *Ch. imperialis*; in the development of the markings of the forewing above *pythodorus* agrees

better with the ♀ than with the ♂ of *imperialis*, inasmuch as in both sexes of *pythodorus* and in the ♀ of *imperialis*, the discal interstitial spots are present.

The differences between the two geographical races of *pythodorus* are not conspicuous, but seem to be pretty constant.

#### a. *Ch. pythodorus pythodorus*.

*Charaxes pythodorus* Hewitson, *Ent. Mo. Mag.* X. p. 57 (1873) (Angola); Kirby, *Cat. Diurn. Lep.* p. 748. n. 77 (1877); Dewitz, *Nor. Act. Leop. Car. Ak. Naturf. L.* 4. p. 371. (1887) (Mukenge); Auriv., *Kongl. Sv. Ak. Handl.* XXXI. 5. p. 239. n. 39 (1899) (Mukenge; Angola; L. Mero). *Charaxes pithodorus* (!), Hewitson, *Ex. Butt. V. Charaxes.* t. 5. f. 18. 19. ♂ (1874); Butl., *Proc. Zool. Soc. Lond.* p. 649. n. 22 (1893) (Rhodesia, L. Mweru, June); id., *Journ. Linn. Soc. Lond.* XXV. p. 375. n. 69 (1896) (L. Mweru; Angola); Lanz, *Iris* IX. p. 142 (1896) (Plateau north of Tanganyika).

♂. *Wings, upperside*.—Forewing: pale blue postdiscal spots  $M^2$  ( $SM^4$ ) completely merged together with the blue discal patch, blue scaling of discal spots  $R^3$ — $M^2$  more or less extended distad, generally reaching the postdiscal spots.—Hindwing: black outer area about 10 mm. broad at  $R^1$ .

*Underside*: submedian costal bar more or less straight, situated in front of subbasal bar C— $SC^2$ .

♀. See above. The blue scaling on upperside of forewing between veins  $R^3$  and  $M^2$  much less extended.

*Hab.* Angola (*type*, Brit. Mus.): ♂ ♀ from Pungo Andongo (Homeyer) in the Berlin Museum; Lake Mweru (Brit. Mus.); plateau north of Lake Tanganyika (this form, or *nesaea*?). In the Tring Museum 2 ♂ ♂ labelled "Congo" and Lukolele, Congo.

#### b. *Ch. pythodorus nesaea*.

*Charaxes nesaea* Grose-Smith, *Ann. Mag. N. H.* (6). III. p. 132 (1889) (Mombasa).

*Charaxes pythodorus*, Aurivillius, l.c. (1899) (Germ. E. Afr.).

♂. *Wings above*.—Forewing: postdiscal spot  $M^2$ —( $SM^1$ ) more or less separate from blue discal patch, sometimes also spot ( $SM^1$ )— $SM^2$  isolated, spots  $R^3$ — $M^2$  not connected with the respective discal spots by pale blue scaling.—Hindwing: black outer area about 14 mm. broad at  $R^1$ .

*Underside*: subbasal costal bar curved distad, more distal than in the preceding form, standing between subbasal and submedian bars C— $SC^2$ .

♀. Unknown.

*Hab.* British E. Africa: Mombasa (coll. Grose-Smith). In the Tring Museum 2 ♂ ♂ from Rau, Nandi country, caught on the 13th and 14th of March, 1898 (Dr. Ansorge); Germ. E. Afr.

*d*<sup>5</sup>. Hindwing below with a rufous chestnut band across middle.

#### 42. *Charaxes hadrianus* (Nov. Zool. VII. t. 7. f. 4. ♂).

*Charaxes hadrianus* Ward, *Ent. Mo. Mag.* VIII. p. 120 (1871) (Cameroons); Kirby, *Cat. Diurn. Lep.* p. 748. n. 68 (1877) (Cameroons); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 381. n. 88 (1896) (Gaboon; *cit. partim falsa*); Auriv., *Kongl. Vet. Akad. Handl.* XXXI. 5. p. 240. n. 48 (1899) (Kamerum; Gaboon; Ogowé; Bangasso, Upp. Uhanghi).



*Charaxes duc* Staudinger, *Exot. Tagf.* p. 170 (1886) (Gaboon).

*Charaxes gabonica* Crowley, *Tr. Ent. Soc. Lond.* p. 553. t. 17. f. 3 (1890) (Gaboon); *id.*, *Proc. Ent. Soc. Lond.* p. 38 (1890) (*gabonica* = *hadrianus*).

♂ ♀. Palpi *above* black; head, pronotum, and anterior part of mesonotum rufous chestnut, meso-metonotum and base of, in ♀ the whole upperside of, abdomen drab brown, rest of abdomen and *underside* white.

♂. *Wings, upperside*.—Forewing: base as far as origin of  $M^1$  rufous chestnut, this area horizontally cut off or sinuate in cell, distally separated by black, proximally ill-defined, more or less heavy, median bars from a broad creamy white discal band; the band about 18 mm. wide at internal margin, 11 mm. distant from base, patch  $M^2$ — $SM^2$  of nearly the same length, bordered grey proximally and distally, patch  $M^1$ — $M^2$  much smaller, obliquely concave distally, patch  $R^3$ — $M^1$  isolated, the wing being black, about 2 to 3 mm. from base of  $M^1$ , spot  $R^2$ — $R^3$  again smaller, discal patches  $SC^5$ — $R^2$  8 mm. from cell; a series of five or six postdiscal spots, also white, spot  $SC^4$ — $SC^5$  absent or minute; a white admarginal spot upon ( $SM^1$ ), sinuate distally; fringe white at ends of internervular folds.—Hindwing: creamy white, base blackish for about 4 mm., this colour gradually shading into grey distally; a series of black submarginal bars, well separated from one another, mostly somewhat concave proximally, shaded at edges with olive grey, bars  $SC^2$ — $R^3$  sometimes rather feebly marked; a thin, black admarginal line, continuous or subinterrupted at internervular folds; abdominal fold slightly shaded with grey, more white, less cream colour than disc.

*Underside*: chalky white, slightly glossy, bars very thin.—Forewing: cell-bar 3 absent, bar 2 very oblique, partly obliterated, bar 4 nearer  $M^2$  than  $M^1$ , angled in middle, the angle pointing distad; submedian bars  $M^1$ —( $SM^1$ ) one in front of the other, 2 mm. from base of  $M^2$ ; median bar  $M^2$ —( $SM^1$ ) 2 mm. distant from the submedian bar; median bar  $M^1$ — $M^2$  1 or 2 mm. more distal, concave distally,  $\frac{1}{2}$  to 1 mm. distal of base of  $M^1$ , bar  $R^3$ — $M^1$  oblique, 4 or 5 mm. from base of  $M^1$ , bar  $R^2$ — $R^3$  close to bar D, parallel to it, distance about  $\frac{1}{2}$  mm., bar  $SC^5$ — $R^1$  7 mm. from cell, oblique, bar  $R^1$ — $R^2$  very little more distal, sometimes convex distally; discal bars  $SC^5$ — $M^2$  more or less vestigial, especially the posterior ones, bar  $M^2$ — $SM^2$  fused with the postdiscal bar to a large black patch, which includes some white scales near proximal edge as vestige of the white discal border of the discal bar; the other postdiscal bars not represented, but the postdiscal interspaces occupied by white spots as above; outer two-thirds of wing more glossy than base and internal marginal area.—Hindwing: basal and subbasal costal bars absent, subbasal bars C—M vestigial or absent; submedian costal bar about  $1\frac{1}{3}$  mm. from PC, much more basal than the submedian bars C—M; median bars more proximal than in the allied species, the series almost straight, but interrupted at veins, bar  $R^2$ — $R^3$  very close to bar D, bar  $R^3$ — $M^1$  absent, bar  $M^1$ — $M^2$  midway between  $M^1$  and  $M^2$ , no median bars  $M^2$ — $SM^2$ ; discal bars concave distally, except the last ones, very much heavier than the other bars, forming a continuous series which extends in a straight line from costal to abdominal margin, crossing  $M^1$  about 1 mm. from base and C 15 mm. from end of these veins, the bars edged white distally, contiguous with a postdiscal, rufous chestnut band of 2 mm. width, the band sharply defined, irregularly concave between veins distally, except between  $M^2$  and  $SM^2$ , with vestiges of black postdiscal bars at outer edge, especially behind; black submarginal dots  $R^1$ — $SM^2$  minute, dot  $SC^2$ — $R^1$  sometimes vestigial; admarginal interstitial spots, primrose yellow, extremely pale, spots C— $R^1$  sometimes ochraceous; a

black marginal line, very thin, obliterated between veins, more heavily marked on tails ; upper tail about 5 mm., second 2 mm. long, both blunt.

♀. Like ♂, larger. *Wings above*.—Forewing : creamy white patches larger than in ♂, discal patches  $R^2-M^2$  not separated, patch  $M^1-M^2$  11 mm. long in middle, postdiscal spot  $M^1-M^2$  about  $3\frac{1}{2}$  mm. in diameter, touching discal patch ; besides admarginal spot  $M^2-SM^2$  there is another, minute, admarginal spot between  $M^1$  and  $M^2$ , or a vestige of it.—Hindwing : black basal area a little more extended ; black submarginal bars heavier than in ♂ ; proximal of them there are olive grey patches representing the postdiscal bars, patch  $(SM^1)-SM^2$  black, as are sometimes the upper patches ; white submarginal spots more or less isolated by these postdiscal clouds from the white discal area : abdominal fold shaded with black dispersed scales.

*Underside* : apical half of forewing somewhat shaded with brown scaling ; discal line of bars of hindwing about 4 mm. from base of  $M^1$ , submarginal black dots larger than in ♂.

Length of forewing : ♂, 44—46 mm.

" " " ♀, 48—51 mm.

Clasper in outline similar to that of *tiridates* and allies, but the apical hook not concave on the upper surface, the carina which runs from the tip of the hook to the inner surface of the clasper not sharply raised ; penis armed with a small dorsal tooth 1 mm. before end, a short, low, carina, ending in a small tooth about 3 mm. before end, one or two more small teeth between carina and subapical tooth ; penis-funnel more gradually curved than in *tiridates*, more triangular than in *imperialis*, apical hook very short, vein  $D^3$  of hindwing reaching  $M^1$  about midway between  $M^1$  and  $M^2$  in both sexes.

*Hab.* Niger to Congo. In the Tring Museum 2 ♂♂, 2 ♀♀, from Warri, Niger Coast Protectorate, April (Dr. F. Roth) ; Gaboon ; Kassai country.

The ♂ from the Kassai country (figured on Pl. VII.) has the admarginal spots  $C-SC^3$  of the underside of the hindwing ochraceous. In the ♀ form Warri the submarginal bars of the hindwing above are large, continuous, the postdiscal black patches  $C-R^1$  are also well developed and fused with the submarginal bars, isolating two white submarginal spots, no white admarginal interspace  $C-SC^2$ .

*Ch. hadrianus*, although standing isolated in the present group of species, is nevertheless more closely allied to *Ch. pythodorus*, *ameliae*, and *imperialis* than to any other *Charaxes*. In the pattern of the upperside of the forewing it agrees well with the females of *Ch. imperialis* and *ameliae*, and with both sexes of *pythodorus* ; the nearly all white hindwing seems at first sight to be a very peculiar character, but is only the outcome of an exaggerated development of white scaling which has already begun in *Ch. pythodorus*. The proximal movement of the discal luniform bars of the underside of the hindwing is peculiar to this species ; the other bars of the underside, except the large postdiscal patch  $M^2-SM^2$  of the forewing, are more or less feebly marked, agreeing in position fairly well with the species with which we here associate *hadrianus*. The uniform appearance of the underside, however, is glaringly interrupted by the band across the hindwing. This band, which is so very prominent on the white ground, must surely have some biological meaning ; the resemblance of *hadrianus* to *Pieridae* is not enhanced by it.

*f*<sup>4</sup>. Nearly all the bars of underside tawny.

*e*<sup>5</sup>. Abdominal area of hindwing below without tawny longitudinal lines.

*e*<sup>6</sup>. ♂, forewing with two series of postdiscal and admarginal orange spots, which are merged together posteriorly at base to a broad band ; ♀, postdiscal spots of forewing above orange.

#### 43. *Charaxes azota* (Nov. Zool. V. t. 5. f. 3. ♂).

*Philognoma azota* Hewitson, *Ent. Mo. Mag.* XIV. p. 82 ♀ (1877) (Del. Bay, ♀).

*Charaxes azota*, id., *l.c.* XIV. p. 181, ♂ (1878) (Nyassaland) ; Trimen & Bowk., *S. Afr. Butt.* III. p. 387. n. 384 (1889) (Del. Bay, Nyassa) ; Monteiro, *Delagoa Bay* t. 1. f. 1 (1891) ; Trim., *Proc. Zool. Soc. Lond.* p. 40. n. 61 (1894) (Manica) ; Butl., *Ann. Mag. N. H.* (6). XV. p. 248 (1895) (Del. Bay) ; id., *Journ. Linn. Soc. Lond.* XXV. p. 365. n. 36 (1896) (Del. Bay) ; Auriv., *Konigl. Sv. Ak. Handl.* XXXI. 5. p. 235 n. 23 (1899) (Del. Bay, Manicaland).

*Charaxes calliclea* Smith, *Ann. Mag. N. H.* (6). III. p. 130 (1899) (Mombasa).

*Charaxes nyasana* Butler, *ibid.* (6). XV. p. 249 (1895) (Nyassaland) ; id., *Proc. Zool. Soc. Lond.* p. 253. n. 11 (1895) (Zomba).

*Charaxes azota* local form : *Charaxes calliclea*, Butler, *Journ. Linn. Soc. Lond.* XXV. p. 365 sub n. 36 (1896) (Mombasa).

*Charaxes azota* local form : *Charaxes nyasana*, Butler *l.c.*

*Charaxes azota* var. (ab. ?) *nyasana*, Aurivillius, *l.c.* (1899) (Nyassaland).

*Charaxes azota* var. (ab. ?) *calliclea*, id., *l.c.* (1899) (Mombasa).

♂. *Upperside* of palpi, head, prothorax and anterior part of tegulae bright cinnamon rufous, rest of upperside olive black, abdomen often somewhat chocolate, four dots on head white, more or less obvious ; *underside* of palpi, and the sterna dark vinaceous cinnamon, legs and abdomen paler, second segment of palpi with a thin pale line at eye, its tip laterally and the greater part of segment 3 black.

*Wings* above velvety black, faintly purplish, both with a wide cadmium orange postdisco-marginal band.—Forewing : costal edge cinnamon rufous, this colour extending into cell, often occupying the basal half of the cell, the very edge of the wing generally black, at least in middle, base behind cell up to M<sup>2</sup> often faintly shaded with cinnamon rufous, vein M often of the same colour up to R<sup>3</sup> ; the orange band includes a series of black submarginal spots, variable in size and number, the upper ones always confluent, hence the band divided into an admarginal and a postdiscal portion, the veins traversing the band more or less heavily black, except the posterior ones, the size of the orange patches or spots into which the band is thus separated very variable in size ; extreme outer margin always black.—Hindwing : band variable in width individually, narrowest in front as a rule, measuring 8 to 12 mm. at SC<sup>2</sup>, its proximal edge slightly irregular, crossing R 1½ to 4 mm. distally of M<sup>1</sup> ; black submarginal dots M<sup>2</sup>—SM<sup>2</sup> (with white centres) nearly always present, the submarginal dots SC<sup>2</sup>—M<sup>2</sup> sometimes more or less obviously vestigial, especially dot SC<sup>2</sup>—R<sup>1</sup> often conspicuous.

*Underside* vinaceous cinnamon rufous, with a whitish vinaceous gloss, bars, postdisco-marginal area of forewing, and postdiscal and admarginal interspaces of hindwing not glossy ; postdisco-marginal area of both wings somewhat orange : basal to median bars cinnamon rufous, except bars M<sup>2</sup>—SM<sup>2</sup> of forewing, which are black.—Forewing : cell-bars heavy, bar 3 often separated into two dots, bar 4 slightly oblique, slightly angled in middle in many specimens, narrowed behind, basal cell-spot absent ; submedian bars M<sup>1</sup>—SM<sup>2</sup> continuous with each other and cell-bar 4 ; median bars M<sup>1</sup>—SM<sup>2</sup> also continuous, but bar R<sup>3</sup>—M<sup>1</sup> more distal, bar R<sup>2</sup>—R<sup>3</sup> fused with bar D as a rule, bars SC<sup>4</sup>—R<sup>2</sup> angle-shaped, fused together to a



short zigzag band, sometimes thin, occasionally overshadowed with glossy vinaceous scales; discal bars rather ill-defined, slightly luniform, standing in a continuous series, which at (SM<sup>1</sup>) is about 10 mm. distant from edge of wing and at R<sup>1</sup> only 8 mm., the series running apicad from M<sup>1</sup> to R<sup>1</sup>, and costad from R<sup>1</sup> to SC<sup>4</sup>; postdiscal interspaces tawny ochraceous at discal bars; postdiscal bars M<sup>2</sup>—SM<sup>2</sup> developed to a black patch of variable size; glossy pinkish white submarginal spots SC<sup>3</sup>—SC<sup>5</sup> conspicuous, the others vestigial.—Hindwing: basal costal bar not very distinct, anteriorly often joined to costal submedian bar; no basal to submedian bars on abdominal fold; submedian bars continuous, forming an oblique, slightly curved line which crosses M just before M<sup>2</sup>; median bars also continuous, forming a straight, or nearly straight, line from costal margin to SM<sup>2</sup>, twice as heavy costally as behind as a rule, crossing M midway between M<sup>1</sup> and M<sup>2</sup>; discal bars luniform, proximally very ill-defined, dark cinnamon rufous, with orange or yellow buff lunules or spots at outside; postdiscal bars more or less tawny orange, their outer edges well defined, incurved; submarginal pinkish white dots C—SM<sup>2</sup> all present, but very small, the last two or three joined to black submarginal dots; upper tail 2 to 3 mm., second a mere tooth.

♀. Body *above* as in ♂, but abdomen sepia or broccoli brown; *underside* paler than in ♂.

*Wings, above.*—Forewing; costal margin paler than in ♂; a discal band from R<sup>3</sup> to internal margin, white, anteriorly mostly shaded with yellow, 25 mm. broad at internal margin, patches R<sup>3</sup>—M<sup>2</sup> triangularly concave outwardly, patch R<sup>3</sup>—M<sup>1</sup> about half (or less than half) the size of patch M<sup>1</sup>—M<sup>2</sup>, discal spot R<sup>2</sup>—R<sup>3</sup> close to cell seldom conspicuous, mostly vestigial, often absent, always small, discal spots SC<sup>5</sup>—R<sup>2</sup> yellowish, seldom almost white; 4 to 5 mm. long, mostly slightly concave proximally, often preceded by one or two streaks; the basal area up to the discal markings brownish black, but part of cell of the same colour as costal margin of wing; discal black bars represented by a curved black band from SC<sup>4</sup> to R<sup>3</sup>, followed by two arrow-head- or angle-shaped spots, bar M<sup>2</sup>—(SM<sup>1</sup>) often vestigial; upon these bars follows a series of postdiscal, orange, somewhat ovate, spots, the upper four measuring about 5 mm. in length, spot R<sup>3</sup>—M<sup>1</sup> larger, the spots generally separate, seldom fused together, mostly somewhat ochreous near black discal bars; postdisco-submarginal black band widened behind and in front, very seldom separated into spots; an admarginal orange band of about 2½ mm. width, consisting of halfmoons, which are sometimes separated from one another; extreme edge of wing black, fringe white between veins.—Hindwing: middle of wing from costal to abdominal margin occupied by a broad white band, of which the inner edge crosses SC at base of R<sup>1</sup>, shaded outwardly, especially in front, with orange; this white area bordered by a black postdisco-submarginal band, which is parallel to outer margin, but is generally narrower costally and abdominally than in middle, measuring between R<sup>3</sup> and M<sup>1</sup> about 8 mm., distally dentate upon veins; the band includes two or three white submarginal dots posteriorly, and is followed by an orange admarginal band about 4 mm. in width between R<sup>3</sup> and M<sup>1</sup>; edge of wing black; base black.

*Underside* paler than in ♂, vinaceous tawny up to median bars, discal interspaces of fore- and hindwing and postdiscal ones of hindwing ochre yellow, the discal ones of forewing becoming creamy white towards internal margin.—Forewing: bars as in ♂, but submedian and median bars M<sup>1</sup>—SM<sup>2</sup> closer together, often fused, postdiscal interspaces partly ochreous; black patch near



internal angle very variable in extent, sometimes altogether replaced by tawny.—Hindwing: discal luniform bars generally clearly defined, but sometimes partly obliterated; basal costal bar indistinct; upper tail 3 to 6 mm. long, rounded at tip, second 1 to 2½ mm.

Length of forewing : ♂, 38—42 mm.

" " ♀, 42—50 mm.

Clasper slender, the ridge which forms the inner edge of the hook continued on to the inner surface of the clasper, here situated much closer to the ventral than the dorsal edge of the clasper ; penis curved before end, with the trace of a dorsal tooth at the bent, without other armature ; penis-funnel not triangular, as broad at apex nearly as at base, slightly narrowed before apex, apical edge turned downwards, rounded, not narrowed to a point ; the processes of the tenth tergite are short.

Vein D<sup>3</sup> of hindwing in both sexes about midway between M<sup>1</sup> and M<sup>2</sup>. PC of ♂ and especially of ♀ with a short spnr.

*Hab.* Delagoa Bay to Nyassaland and Brit. E. Africa. In the Tring Museum from: Delagoa Bay, 16 ♂♂, 4 ♀♀; Lauderdale, Brit. Cent. Afr., 1 ♂; Chipaika Estate, near Bandawe, Brit. C. Afr., 3 ♂♂, 1 ♀ (Watkinson); Zomba, Brit. C. Afr., December, 1895, 1 ♂, 1 ♀ (Dr. Percy Rendall); Parumbira, Lake Nyassa, German E. Afr., 8. xi. 93 and 9. xi. 93, 3 ♂♂ (Dr. Ansorge); German E. Afr., 1 ♀; Taveta, Brit. E. Afr., July 1891, 1 ♂. Mombasa, Brit. E. Afr., in coll. Grose-Smith; Dar-es-Salaam in Berlin Mus. and coll. Staudinger; Majuji, N. Uegua, end of May, in Berl. Mus. A long series from Zomba in H. J. Adams's collection.

A ♀ in the Tring Museum without exact locality, said to be from German East Africa, has the black postdisco-submarginal bands of both wings very much reduced; on forewing there is, instead of a continuous band, a series of minute dots from  $SC^5$  to  $M^2$ , followed by two somewhat larger spots, while on the hindwing the band is not interrupted, but its postdiscal portion is replaced by orange, so that the black band is only 3 mm. wide between veins; the band stops costally at  $SC^2$ .

We do not agree with Dr. Butler that the specimens from the various localities are subspecifically separable. The characters adduced by Dr. Butler as separating the individuals from Nyassaland from those from Delagoa Bay do not hold good; Dr. Butler, when describing *nyasana* in 1895, and again when writing the note on *azota*, *nyasana* and *calliclea* in his revision of the genus in 1896, had only one ♂ from Delagoa Bay for comparison. Our series of 16 *males* from that locality proves that the number and size of the black markings within the orange bands of the upperside are individually very variable; in some of the specimens the series of spots reaches on the forewing down to SM<sup>2</sup>, while in others it stops at R<sup>3</sup>, while others again are intermediate.

When Mr. Grose-Smith described *calliclea* as a distinct species, he had overlooked that the insect had already received the name of *azota* by Hewitson.

f<sup>6</sup>. ♂, Forewing above without postdisal orange spots, upper admarginal dots very small or absent; ♀, postdisal spots of forewing above white or creamy white.

44. *Charaxes protoclea*.

*Charaxes protoctlea* Feisthamel, *Ann. Soc. Ent. Fr.* p. 260. n. 12 (1850) (Casamance); Butl., *Proc. Zool. Soc. Lond.* p. 627. n. 13 (1865); Dewitz, *Nov. Act. Leop. Car. Ac. Naturf.* L. 4. p. 371 (1887) (Mukenge, April); Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 126. n. 71 (1889)

(Kassai); id., *l.c.* p. 146. n. 78 (1889) (Congo); Schaus & Clements, *Sierra Leone Lepid.* p. 8 (1893); Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 192. n. 60 (1893) (Adeli); Butl., *Ann. Mag. N. H.* (6). XV. p. 248 (1895); id., *Journ. Linn. Soc. Lond.* XXV. p. 364. n. 35 (1896) (Cameroons; O. Calabar; S. Leone); Auriv., *Kongl. Sc. Ak. Handl.* XXXI. 5. p. 234. n. 22 (1899) (Senegambia to Angola).

♀. *Charaxes aeson* Herrich-Schaeffer, *Aussereur. Schmett., Tagf.* f. 9. 10 (1850) (Afr. occ.).

♂. *Nymphalis protoclea* Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 14 (1850); Kirby, *Cat. Diurn. Lep.* p. 268. n. 13 (1871).

♀. *Nymphalis aeson*, id., *l.c.* p. 272. n. 51 (1871) (Gold Coast).

♂. *Upperside* of head, prothorax, anterior part of tegulae deep chestnut; meso-metanotum olive black, abdomen seal brown, nearly black; palpi black; *underside* drab colour, with a chocolate tint.

*Wings above* velvety black, with a bluish tint in side-light.—Forewing: admarginal interspaces from  $M^1$  or  $M^2$  to internal margin cadmium orange, the spots sometimes fused together, forming a short band of from 2 to 5 mm. width behind, in some specimens there are tiny admarginal dots also between veins  $SC^3$  and  $M^1$ ; fringe white between veins.—Hindwing with a broad postdisco-admarginal, cadmium orange band, narrowing in front, 4 to 9 mm. broad at  $SC^2$ , 10 to 12 mm. at  $M^1$ ; a series of black submarginal dots, the dots all present, or some or nearly all absent, dot C— $SC^2$  often rather large and fused with the black area; extreme edge of wing black, fringe white between veins.

*Underside* darker than in *azota*, varying from vinaceous walnut brown to olivaceous mummy brown; bar nearly as in *azota*, but on forewing, cell-bar 3 divided into two dots, cell-bar 4 strongly curved distad in middle, median bar  $M^1$ — $M^2$  more distal than bar  $M^2$  ( $SM^1$ ), on hindwing, discal and postdiscal bars rather more obvious, the glossy submarginal area reduced in width, almost separated into large halfmoons, white submarginal dots heavier; upper tail  $1\frac{1}{2}$  to 2 mm., second a mere tooth.

♀. Body as in ♂, but *underside* paler, clay colour, palpi more creamy buff.

*Wings above* black, slightly bluish in side-light; discal band across both wings as in *azota* ♀, but milky white, bluish at edges, somewhat narrower.—Forewing: costal margin slightly chocolate towards base; discal band 11 to 13 mm. broad at  $SM^2$ , 5 mm. from cell behind  $M^1$ , spot  $R^2$ — $R^3$  vestigial, seldom absent, spots  $SC^5$ — $R^2$  separated, the second about twice as long as broad; postdiscal spots  $SC^4$ — $M^2$  as in *azota* ♀, but smaller, especially the upper four, spots  $R^3$ — $M^2$  separated from discal band by black arched or angled bars, bar  $M^1$ — $M^2$  often abbreviated, bar  $M^2$ —( $SM^1$ ) sometimes vestigial, the postdiscal spots milky white or slightly tinged with yellow; admarginal spots orange, variable in size individually, gradually decreasing in size costad, spots  $SC^3$ — $M^1$  generally mere dots, spots  $M^2$ — $SM^2$  mostly confluent to one elongate spot, but sometimes well separated and minute.—Hindwing: discal band narrowing behind, the abdominal fold not being white; its outer edge almost straight, slightly convex; postdisco-submarginal black band as in *azota* ♀, but broader, especially its first partition broader than in that species, measuring between  $R^3$  and  $M^1$  from 9 to 12 mm.; 2 to 5 white submarginal dots in this band; orange admarginal band on the whole less regularly convex between veins proximally than in *azota*.

*Underside* dark fawn colour from base to median series of bars, approaching vinaceous cinnamon; discal and postdiscal spots and band of forewing and disco-postdiscal band of hindwing as above, but creamy white, the postdiscal spots more



bar D and heavy median bar  $R^2$ — $R^3$  fused together, with orange rufous spots  $SC^{4,5}$ — $R^3$  at outside, these spots fused together, seldom separated, spot  $R^2$ — $R^3$  smaller than the other two, sometimes minute; black submedial-discal area nearly the same as in *lucretius*, narrower and better defined behind, with two discal spots  $SC^5$ — $R^2$  of variable size, sometimes also with traces of thin discal lunules  $R^3$ — $M^1$ ; postdiscal band of bright orange rufous spots more oblique than in *lucretius*, patches  $R^3$ — $M^2$  generally with a black incision or a black line anteriorly, representing the discal bars, admarginal spots smaller than in *lucretius*, mostly somewhat separate from edge of wing, patch  $M^2$ — $SM^2$  externally nearly always incised upon ( $SM^1$ ), and proximally produced into a short line upon ( $SM^1$ ), as in *boueti*.—Hindwing: disco-postdiscal band somewhat widened basad in and beyond cell to near base of  $M^2$ ; admarginal rufous orange band as in *boueti*, the black postdisco-submarginal band distally somewhat produced at veins and internervular folds, hence the admarginal interspaces not regularly convex between veins as in *lucretius*; marginal black line thin as in *boueti*; of the submarginal blue and white dots only the last two are marked.

*Underside* vinaceous hazel, median and discal interspaces of forewing and submarginal area of hindwing with a rather slight whitish pink gloss in side-light, bars bright cinnamon rufous, heavy.—Forewing: basal third of costal margin white; cell and discal interspaces somewhat clayish, basal cell-spot present, cell-bar 4 strongly curved twice, its upper end pointing distad; submedian and median bars  $M^2$ — $M^2$  very heavy, patch-like, generally joined together at ( $SM^1$ ), black, some bluish white scaling between them, submedian bar  $M^1$ — $M^2$  proximal of  $M^1$ , median bar  $M^1$ — $M^2$  5 mm. from base of  $M^1$ , both bars black behind, no submedian bar  $R^3$ — $M^1$ , median bar  $R^3$ — $M^1$  sometimes feeble, slightly curved distad, 1 or  $1\frac{1}{2}$  mm. more distal than median bar  $M^1$ — $M^2$ , bar  $R^2$ — $R^3$  touching bar D behind, median bars  $SC^5$ — $R^2$  in the usual place, each angle- or halfmoon-shaped; discal bars uniform, obscurely marked, edged externally with pale greenish buff lunules, bars  $R^3$ — $M^2$  separated from median bars; outside median bars a pale pinkish buff patch, from  $M^2$  to internal margin, much widened behind; postdiscal bars represented by spots, of which spots  $M^1$ — $SM^2$  are black, spots  $M^2$ — $SM^2$  large, fused together, with three more or less separate bluish white spots outwardly, the other postdiscal spots indistinct, also with some pale submarginal scaling distally, which is more distinct between  $SC^4$  and  $SC^5$ ; posterior orange admarginal spots rather obvious.—Hindwing: costal margin of wing edged with orange rufous, basal costal bar long, curving distad, subbasal bars C—M continuous, but bar M—( $SM^1$ ) more basal and almost longitudinal; submedian line of bars slightly irregular, crossing M just at the base of  $M^2$ ; median bars continuous, forming an almost straight line which is outwardly bordered with a thin black line which crosses M proximally of base of  $M^1$ ; discal interspaces occupied by continuous silvery white band,  $1\frac{1}{2}$  to  $2\frac{1}{2}$  mm. broad, variable in width individually and geographically, extending to abdominal margin, bordered distally by the discal bars, of which the upper ones are arched; all discal bars bordered outwardly with pale olivaceous buff; postdiscal bars chestnut tawny, arched, generally rather dilated basad between veins, ill-defined proximally, better so distally; white submarginal dots vestigial, with pinkish buff transverse spots at outside, last two dots more obvious, with the black submarginal dots present; anal admarginal spot olive buff; edge of wing a little less sharply dentate than in *lucretius*; tails triangular, pointed, upper one 4 to 5 mm. long, second 3 to 4 mm.



♀. *Body above* somewhat darker than in ♂ abdomen *beneath* without the black lines of *lucetius*.

*Wings, upperside*, as in ♂, but basal area of forewing much less bright and less extended, cinnamon rufous, the disco-postdiscal band buff yellow, distally tinged with orange rufous, seldom shaded with brown, broader than in ♂, measuring 9 mm. in width at SM<sup>2</sup>, the discal portions of the patches R<sup>3</sup>—M<sup>2</sup> larger than in ♂; median spots SC<sup>5</sup>—R<sup>3</sup> pale ochraceous rufous; admarginal spot as in ♂, but spots SC<sup>3</sup>—M<sup>2</sup> larger than in ♂, about equal in size.—Hindwing: disco-postdiscal band buff yellow, wider than in ♂, 8 mm. broad at R<sup>1</sup>, edged externally with rufous orange; admarginal orange rufous band more even in width than in ♂, being comparatively narrower in middle than in the other sex, its proximal edge evenly convex between veins down to R<sup>3</sup>; band of both wings sometimes suffused with brown.

*Underside*: paler than in ♂, the interspaces between the heavy bars more glossy; discal and postdiscal interspaces of forewing and large halfmoons at outside of discal bars of hindwing as well as cell of forewing buff, more or less pale, discal band of hindwing silvery as in ♂, but wider, or pale yellowish buff like discal patches M<sup>1</sup>—SM<sup>2</sup> of forewing; tails longer than in ♂, the upper one slightly spatulate, 8 to 9 mm. long, the second pointed, 6 to 7 mm. long.

Length of forewing: ♂, 38—42 mm.

” ” ♀, 45—49 mm.

Hook of clasper irregularly denticulate at upper edge, rather strongly curved, acute; penis curved before the end, no armature except a feeble ridge about 2½ mm. from the tip which bears some small teeth, the ridge is oblique, turning proximally towards the left side; penis-funnel somewhat narrower towards the end, apex rounded when seen from above, apical margin turned downward to form a rather heavy hook.

Vein D<sup>3</sup> of hindwing in both sexes before M<sup>1</sup>, as in *boueti*.

*Hab.* West African Forest Region, from Sierra Leone to Angola and Uuyoro; Fernando Po, coll. Grose-Smith. In the Tring Museum 15 ♂♂, 8 ♀♀ from: Sierra Leone; Gold Coast; Warri, Niger Coast Protectorate, February and April (Dr. Roth); Congo; Lukolele, Bopoto, Kassai; two and three days' march from Ft. Beni, Arnwimi Forest, May 6. 7. 1899 (Dr. Ansorge); Fajao, Uuyoro, 15. vii. 97 (Dr. Ansorge). This is a close ally of *Ch. boueti*, of which it may be called the West African representative, though the two insects cannot very well be united to one species, the differences between them being too great.

*Charaxes cynthia* has apparently developed into two subspecies, the one inhabiting the northern parts of West Africa from Sierra Leone to the Niger, the other ranging from Cameroons to Uuyoro. We have not seen sufficient material of the *female* sex, and therefore do not give a name to the Congolese form, but point out the following differences between the *males*:

Sierra Leone to Niger: Postdiscal band of forewing *above* posteriorly obviously paler than in front; discal band of hindwing ferruginous buff yellow, edged with orange rufous. White discal band of *underside* of hindwing 2 to 4 mm. broad before SC<sup>2</sup>.

Cameroons, Congo, to Uuyoro: Band of forewing *above* not distinctly paler behind than in front; band of hindwing orange rufous, little paler proximally; orange rufous admarginal band of hindwing *above* and *below* wider than in *cynthia cynthia*. On *underside* the white discal band is on the whole narrower than in the northern race.

46. *Charaxes boueti* (Nov. Zool. VI. t. 8. f. 2. ♂).

*Charaxes boueti* Feisthamel, *Ann. Soc. Ent. Fr.* (2). VIII. p. 261 (1850) (Gambia).

♂. *Body, above*, clayish tawny ochraceous, head, pronotum, anterior portion of mesonotum, and palpi ochraceous rufous; *underside* creamy buff, palpi and middle of prosternum almost white; palpi with a black dorso-lateral line; anterior tibiae and oblique stripes on breast underneath legs ochraceous.

*Wings, above*, orpiment orange, marked with black, base slightly less bright than disc.—Forewing: no bars in cell; bar D thin; median bars heavy, patch-like, bars  $R^3$ — $SM^2$  gradually a little more proximal; bar  $R^2$ — $R^3$  close to apex of cell, touching posteriorly bar D, sometimes absent, bars  $SC^5$ — $R^2$  in the ordinary place, more or less triangular; discal bars  $SC^4$ — $M^2$  present, mostly rather heavy, bar  $M^2$ —( $SM^1$ ) sometimes vestigial, bar  $SC^4$ — $SC^5$  triangular, produced basad, bar  $R^2$ — $R^3$  extending proximad to median bar  $R^1$ — $R^2$ , with which it is often fused, bars  $R^3$ — $M^2$  smaller, generally luniform, sometimes linear, spot  $M^1$ — $M^2$  seldom absent; postdiscal and submarginal bars fused together with the marginal line to a postdisco-marginal band which is proximally incised upon or at veins, and includes the orpiment orange admarginal spots, which anteriorly decrease in size, spots  $M^2$ — $SM^2$  fused to one patch, band 6 mm. wide before ( $SM^1$ ), about 4 mm. upon fold  $R^1$ — $R^2$ ; veins  $SC^4$ — $R^3$  between discal and postdiscal black markings often all black.—Hindwing: median bars C— $R^3$  vestigial, sometimes rather clearly marked, often with pale scaling at outside; a postdisco-submarginal band of variable width, narrowest behind, composed of patches which are either separated or fused together, patch  $SC^2$ — $R^1$  the largest,  $3\frac{1}{2}$  to 5 mm. wide, somewhat prolonged distad at  $SC^2$ , as the other patches also often are, but in a lesser degree, the band of about the same width as the orpiment orange admarginal band, the difference in width not considerable, sometimes patches  $R^2$ — $SM^2$  obsolete; submarginal blue and white dots  $M^2$ — $SM^2$  present; anal admarginal interspace olive buff; marginal black line thin, not interrupted.

*Underside* ochraceous buff, slightly variable in the depth of the tint, the bars thin, tawny ochraceous, except posterior bars of submedian, median, and postdiscal series, which are black.—Forewing: basal third of costal edge silvery white; cell-bar 3 separated into dots, no basal cell-spot; median bar  $R^3$ — $M^1$  about 4 mm. from base of  $M^1$ , interspace between median and submedian bars  $M^2$ — $SM^2$  mostly bluish; discal bars halfmoon-shaped, the series almost parallel to outer margin, but anteriorly curving costad, the upper bars developed to ill-defined triangular patches; postdiscal series parallel to the discal one, interspace between veins about 2 to 3 mm, bars ill-defined, posterior ones patch-like and triangular, with whitish blue or bluish white scaling at outside; internal margin more or less extended bluish white.—Hindwing: basal costal bar short, median bars continuous, forming a straight or nearly straight line which crosses M just proximally of base of  $M^1$ , often more or less broadly bordered with silvery white, as sometimes is the submedian series proximally; discal bars luniform, feebly marked, rather close to median series, ochraceous, bar  $R^3$ — $M^2$  only 1 or 2 mm. from base of  $M^1$ , postdiscal bars often better defined and more tawny, but sometimes very obscure; buffish white submarginal dots more or less vestigial, last two heavier and with blue-black dots at outside; admarginal interspaces pale orange ochraceous or ochre yellow, anal one olive buff; edge of wing dentate, tails acute, upper one 3 to 4 mm., second 5 mm. long.



*Hab.* Tropical East Africa : Manicaland ; Nyassaland ; Tanganyika ; Usambara (coll. Staudinger) ; Mpwapwa (coll. Staudinger) ; Mombasa (coll. Grose-Smith). In the Tring Museum 3 ♂♂, 2 ♀♀ from : Zomba, December 1895 (Dr. Percy Rendall) ; Bandawe, Nyassaland, April 15th, 1899 (F. Watkinson) ; German E. Africa, without precise locality.

*b. Ch. boueti boueti* (Nov. Zool. VI. t. 8. f. 2. ♂, type).

*Charaxes boueti* Feisthamel, *l.c.* ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 367. n. 43 (1896) (Gambia) ; Auriv., *l.c.* t. 5. f. 2. ♂ (1899) (Casamance).

♂. *Wings, above.*—Forewing : median bar  $R^2$ — $R^3$  very thin, completely fused with bar D ; discal bars  $SC^1$ — $R^3$  all heavy and fused together, the orange patch included between them and the median bars  $SC^1$ — $R^2$  smaller than in *lasti*.—Hindwing : black postdisco-submarginal band not interrupted from C— $M^2$ , narrower than in the specimens of *lasti* with a not interrupted band.

*Underside.*—Forewing : submedian, median, and postdiscal bars  $M^1$ — $M^2$  black ; median bar  $R^2$ — $R^3$  touching bar D posteriorly.—Hindwing : submedian and median lines of bars more blackish than in *lasti*, the interspace between them darker ; nervular lines and bars on abdominal fold more obvious than in *lasti*.

*Hab.* Senegambia : Casamance 1 ♂ (*type*) in coll. Oberthür ; 2 specimens in the British Museum from the Hinterland of Sierra Leone.

Mons. Chas. Oberthür has kindly sent us a drawing of the *type* of *boueti*, which is reproduced on Plate VIII. of Vol. VI.

The differences between *boueti* and *lasti* may be purely individual, considering that *lasti* is a very variable insect. We cannot find any constant difference between the specimens from Nyassaland and those from the coast region of German and British East Africa.

*h<sup>2</sup>.* Cell-bar 3 of forewing below heavier than bar 4, narrowed in front, submedian and median bars  $M^1$ — $SM^2$  of forewing very heavy.

#### 47. *Charaxes lucretius*.

*Papilio Eques Achirus lucretius* Cramer, *Pap. Exot.* I. p. 129. t. 82. f. E. F (1777) (Guinea) ; Fabr., *Spec. Ins.* II. p. 22. n. 91 (1781) (Guinea) ; id., *Mant. Ins.* II. p. 12. n. 107 (1787) ; Jabl. & Herbst, *Naturs. Schmett.* IV. p. 73. n. 158. t. 66. f. 1. 2 (1790) ; Gmelin, *Syst. Nat.* I. 5. p. 2244. n. 340 (1790) (Guinea).

*Papilio Nymphalis lucretius*, Fabricius, *Ent. Syst.* III. 1. p. 84. n. 261 (1793) (Guinea).

*Eriboea lucretia* (!), Hübner, *Verz. bek. Schmett.* p. 47. n. 425 (1816-27).

*Nymphalis lucretius*, Godart, *Ent. Méth.* IX. p. 352. n. 7 (1823) (Guinea) ; Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 308. n. 6 (1850) (Guinea) ; Kirby, *Cat. Diurn. Lep.* p. 268. n. 10 (1871) (Guinea) ; Dewitz, *Nov. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 8 (1879) (Chinchoxo).

*Charaxes lucretius*, Doubleday, *List. Spec. Lep. Ins. Brit. Mus.* I. 111 (1844) ; Butl., *Proc. Zool. Soc. Lond.* p. 626. n. 11 (1865) (Guinea) ; id., *Cat. Diurn. Lep. descr. by Fabr.* p. 53. n. 12 (1869) (Asbanti) ; Staud., *Exot. Tagf.* p. 169. t. 58 (1886) (Gaboos, Fernando Po, Gold Coast) ; Dewitz, *Nov. Act. Leop. Car. Ak. Naturf.* L. 4. p. 371 (1887) (Mukenge, Nov.) ; Butl., *Proc. Zool. Soc. Lond.* p. 60. n. 15 (1888) (Monbuttu, Equat. Afr.) ; Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 125. n. 66 (1889) (Kassai ; Congo) ; id., *l.c.* p. 146. n. 76 (1889) (Gaboos) ; Mab., *Ann. Soc. Ent. Fr.* (6). X. p. 22 (1890) (Assinie) ; Godm. & Salv., in Jameson, *Story Rear Columu* p. 440. n. 80 (1890) (Aruwimi) ; Möschl., *Abh. Senk. Ges.* XV. p. 61. n. 99 (1890) (Aburi) ; Auriv., *Ent. Tidskr.* XII. p. 215. n. 138 (1891) (Cameroons) ; Schaus & Clements, *Sierra Leone Lepid.* p. 8 (1893) ; Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 187. n. 52 (1893) (Adeli, Togo) ; Auriv., *l.c.* XV. p. 310. n. 189 (1894) (Cameroons ; I.—VI. ; IX.—XI.) ; Butl.,



*Journ. Linn. Soc. Lond.* XXV. p. 366. n. 39 (1896) (S. Leone ; Isubu ; Cameroons ; O. Calabar ; Fernando Po ; Accra ; Ashanti ; Angola) ; Anriv., *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 234. n. 19 (1899) (Sierra Leone to Angola and the Aruwimi R.).

♂. Head, pronotum and anterior portion of mesonotum as well as *upperside* of palpi dark cinnamon rufous, rest of meso- and metanotum brownish black, abdomen chestnut, dots on head and pronotum obsolete or absent ; *underside* ochraceous tawny, breast more hazel, palpi with a black dorso-lateral stripe which is thinly edged with white beneath ; middle and hinder femora black above, with a sprinkling of whitish scales.

*Wings, above*, with a strong purplish blue sheen all over in side-light, black, cell of forewing cinnamon rufous, this colour extending more distad at costal margin and occupying also base of wing beyond cell where it shades into the black colour ; discal and admarginal marking rufous orpiment orange, the discal band of the hindwing anteriorly somewhat paler.—Forewing : cell-bar 4 more or less heavily marked, bars 2 and 3 mostly vestigial ; bar D broad, generally partly separated from the black discal area by some rufous orpiment orange spots, never quite isolated ; a postdiscal band of spots, straight, almost parallel to margin, about 4 mm. broad at SM<sup>2</sup>, decreasing in width costad, the upper spots rounded, spot SC<sup>4</sup>—SC<sup>5</sup> mostly very small, sometimes absent ; admarginal spots halfmoon-shaped, the series complete, the upper ones smaller, spots M<sup>2</sup>—SM<sup>2</sup> not fused together.—Hindwing : disco-postdiscal band of nearly even width, proximally sinuate at SC<sup>2</sup>, crossing R<sup>1</sup> at right angles, 4 to 7 mm. broad at this vein, its inner edge crossing M at point of origin of M<sup>1</sup> ; admarginal interspaces developed to a complete, uninterrupted band of halfmoons, about 4 mm. wide between veins ; marginal black line barely  $\frac{1}{2}$  mm. broad, not interrupted ; submarginal dots M<sup>2</sup>—SM<sup>2</sup> minute, bluish white, the others absent as a rule, but in one of our examples (from the Congo) all the dots vestigial ; edge of wing strongly dentate.

*Underside* : reddish chestnut, forewing somewhat paler than hindwing shading from M<sup>1</sup> to internal margin into orange buff ; basal to median bars black, clearly marked, edged with bluish white.—Forewing : no basal cell-spot, cell-bars 2 and 3 rather heavy, but short, bar 4 thinner, not, or slightly, curved or angled, about at right angles to veins ; bar D thin, anteriorly dilated distad ; submedian bars M<sup>1</sup>—(SM<sup>1</sup>) very heavy, patch-like, bar M<sup>1</sup>—M<sup>2</sup> distal of base of M<sup>1</sup>, no submedian bar R<sup>3</sup>—M<sup>1</sup> ; median bars M<sup>1</sup>—SM<sup>2</sup> heavy, widely separate from submedian bars, median bar R<sup>3</sup>—M<sup>1</sup> thin, more distal than bar M<sup>1</sup>—M<sup>2</sup>, 7 to 9 mm. from base of M<sup>1</sup>, oblique, inclining basal costally, like bar M<sup>1</sup>—M<sup>2</sup>, bar R<sup>2</sup>—R<sup>3</sup> 1 or  $1\frac{1}{2}$  mm. from cell, thin, bars SC<sup>3</sup>—R<sup>2</sup> in the usual place, each one angle-shaped, the points of the angles directed distad ; discal bars SC<sup>4</sup>—(SM<sup>1</sup>) vestigial, represented by chestnut spots which are arranged in an oblique series that anteriorly slightly curves costad and posteriorly touches median bar M<sup>2</sup>—(SM<sup>1</sup>) ; postdiscal bars SC<sup>4</sup>—M<sup>1</sup> represented by similar spots, which are luniform and open basad, postdiscal bar M<sup>1</sup>—M<sup>2</sup> heavier, more or less black, bars M<sup>2</sup>—SM<sup>2</sup> represented by a large black patch that extends to internal margin, veins M<sup>2</sup>, (SM<sup>1</sup>) and SM<sup>2</sup> with pale blue scaling within and at that patch, postdiscal and admarginal interspaces rather paler than the rest of the wing, especially behind.—Hindwing : black bars thin ; basal costal bar short, distant from PC, no subbasal bar C—SC<sup>2</sup>, no basal cell-spot, submedian series extending to (SM<sup>1</sup>), much broken, cell-bar 4 reaching M at point of origin of M<sup>2</sup> ; median series also broken, bar C—SC<sup>2</sup> arched, bars M<sup>2</sup>—SM<sup>2</sup> generally not distinct, reaching abdominal margin 4 or 5 mm. from tip of SM<sup>3</sup> ; discal and postdiscal bars

heavy, somewhat luniform, vinaceous brick red, the series first parallel, then converging, slightly curving distad between  $R^1$  and  $R^3$ , the discal series faintly bordered with white proximally; submarginal pinkish white dots  $SC^2$ — $SM^2$  present, the last two with the black submarginal dots at outside; admarginal interspaces smaller than above, dark ferruginous, thinly edged with pinkish white at both sides; marginal line as above; tails acute, short, upper one 3 to 4, second 2 to 3 mm. long.

♀. *Body above* as in ♂, but abdomen blackish brown; *underside* paler than in ♂, abdomen with two black stripes, interrupted at edges of segments.

*Wings above* blackish brown, with little blue gloss.—Forewing: basal three-fifths of costal margin and part of cell dark cinnamon rufous, cell-bars and bar D less conspicuous than in ♂, owing to the posterior half of cell (or more) being suffused with blackish brown; median bars  $SC^5$ — $R^2$  vestigial in some specimens; postdiscal band of patches as in ♂, but colour varying from creamy white to yellowish buff, posteriorly somewhat broader than in ♂, spot  $SC^4$ — $SC^5$  vestigial or well-marked; admarginal spots smaller than in ♂, often obsolete, the last two often cream colour, the others cinnamon rufous.—Hindwing: disco-postdiscal band varying from creamy white to buff yellow, straight, extending to abdominal margin, of even width from  $SC^2$ , or  $R^1$ , to  $SM^2$ , wider at C, 5 to 9 mm. broad at  $R^2$ , often triangularly sinuate proximally upon  $R^1$ , often incised distally upon veins, edges of band somewhat ochraceous rufous in the more yellow banded specimens; admarginal spots as large as in ♂, but sometimes smaller and clearly separated from one another, ochraceous orange, paler proximally, or very pale buff; submarginal dots  $M^2$ — $SM^2$  as in ♂.

*Underside*: mars brown or fawn colour, postdiscal band of forewing and disco-postdiscal one of hindwing wider than above, less sharply defined, buff or buffish white.—Forewing: median bars  $SC^5$ — $R^2$  more angle-shaped than in ♂, tawny marginal band comparatively more obvious.—Hindwing: discal series of bars very inconspicuous, partly obliterated; postdiscal bars as heavy as or heavier than in ♂, submarginal area shaded with pinkish white, white submarginal dots indistinct; tawny ochraceous admarginal halfmoons somewhat thinner than in ♂, their pinkish white proximal borders broad; tails as in ♂, but longer.

Length of forewing: ♂, 37—41 mm.

“ “ ♀, 40—46 mm.

Clasper not so sharply pointed as in *cynthia*; penis-funnel more triangular, slenderer, apex thickened underneath to a tubercle which is compressed and produced proximally into a tooth; penis thin, with a dorsal tooth about 1 mm. before end, and traces of teeth about 3 mm. from apex.

*Hab.* West African Forest Region from Sierra Leone to Angola and Uganda. In the Tring Museum, 25 ♂♂, 8 ♀♀ from: Sierra Leone; Gold Coast; Cameroons; Congo: Lukolele, Bopoto, Kassai; Pt. Alice, Uganda, February 1, 1897 (Dr. Ansorge).

In the unique specimen (♂) from Pt. Alice the band of the forewing is nearly equal in width, narrower than in most individuals from other places; the bluish white submarginal dots  $R^3$ — $SM^2$  of the upperside of the hindwing are conspicuous, and there is a trace of a further dot before  $R^3$ .

The *females* from the Congo basin and Cameroons have a very pale band.

The specimens from Fernando Po seem to be slightly different from those from other localities. In the single ♂ examined (in coll. Hewitson) the orange parts of the upperside are darker, being more shaded with purple blue, the admarginal

spots are smaller ; the black marginal line of the hindwing is heavier between the veins, the veins within the orange band of the hindwing above are blackish. The ♀♀ have the band of the upperside yellowish ; the admarginal halfmoons of the hindwing are contiguous, shaded with tawny ; admarginal line heavier between veins ; the tawny resp. blackish discal and postdiscal bars of both wings below rather sharply defined, the discal ones especially more strongly marked than in the individuals from other places, the discal tawny ochraceous halfmoon-shaped bars of the hindwing separated by pale buff spots from the chocolate tawny postdiscal band of bars, which shows obvious vestiges of black scaling at the discal edge.

f<sup>2</sup>. Admarginal spots of hindwing large, halfmoon-shaped, several mm. distant from edge of wing.

#### 48. *Charaxes odysseus* (Nov. Zool. V. t. 7. f. 4. ♀).

♀. *Charaxes odysseus* Staudinger, *Iris* V. p. 260 (1892) (St. Thomé) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 366. n. 38 (1896) (St. Thomas) ; Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 234. n. 18 (1899) (St. Thomé).

♂. Unknown.

♀. *Body above* : thorax olive bistre, palpi, head and pronotum more raw umber colour, abdomen mummy brown ; dots on head and pronotum obliterated.

*Underside* drab grey, palpi, middle of pro- and mesosternum, and abdomen more creamy white.

*Wings, upperside* : blackish mummy brown, slightly purplish, basal area of forewing Vandyke brown, of hindwing Prout's brown, abdominal fold shading into wood brown.—Forewing : a large patch in apex of cell purplish black, submedian bar M<sup>1</sup>—M<sup>2</sup> vestigial, broad, median bars traceable, represented by large purplish black patches which are slightly deeper black than the rest of the mediano-marginal area ; a triangular patch at base of cellule R<sup>3</sup>—M<sup>1</sup>, a short streak behind R<sup>2</sup> about 4 mm. from cell, a double patch SC<sup>4,5</sup>—R<sup>2</sup> about 2 mm. from upper angle of cell, cream colour ; two discal spots SC<sup>5</sup>—R<sup>2</sup> almost white, and a band of postdiscal spots white, this band extends from SC<sup>9</sup> to internal margin, widening posteriorly, the spots all separate ; four admarginal patches R<sup>3</sup>—SM<sup>2</sup> creamy white.—Hindwing : a creamy white discal band as prolongation of the band of the forewing, narrowing behind, divided by the brown veins into patches, shaded with brown behind M<sup>2</sup>, its inner edge broken at R<sup>3</sup> ; an admarginal series of creamy white halfmoons from C to M<sup>2</sup> several mm. from edge of wing ; submarginal dots, spots M<sup>2</sup>—SM<sup>2</sup> very small bluish white, no other submarginal spots.

*Underside* : pale clay colour, markings not sharply defined.—Forewing ; no basal cell-spot, cell-bar 2 oblique, thin, cell-bar 3 thicker behind, less oblique, cell-bar 4 thin, slightly undulate, nearly at right angles to veins ; bar D very thin ; submedian and median bars M<sup>2</sup>—SM<sup>2</sup> fused to a large brownish black patch, submedian bar M<sup>1</sup>—M<sup>2</sup> distal of base of M<sup>2</sup>, heavy, like the median bar M<sup>1</sup>—M<sup>2</sup>, no submedian bar R<sup>3</sup>—M<sup>1</sup> ; median bar R<sup>3</sup>—M<sup>1</sup> rather obscure, 8 mm. from base of M<sup>1</sup>, bar R<sup>2</sup>—R<sup>3</sup> close to cell, indistinct, bars SC<sup>4</sup>—R<sup>2</sup> in their usual place (at one-third the way from cell to apex of wing), also not clearly marked ; discal bars SC<sup>4</sup>—R<sup>3</sup> marked as slight clouds, bars R<sup>3</sup>—M<sup>2</sup> scarcely traceable as proximal borders of the creamy white patches ; series of postdiscal patches as above, wider behind, less clearly defined ; postdiscal bars R<sup>3</sup>—SM<sup>2</sup> represented by purplish black patches, submedian



patch very large; admarginal spots as above, larger.—Hindwing: basal costal bar faint as are all the basal to median bars; no submedian bars ( $SM^1$ )— $SM^3$ ; submedian and median series rather far apart, the median series nearly continuous down to  $R^3$ , broken at this vein; discal bars clay colour, continuous, fused at veins with the similarly coloured postdiscal bars, which stand close to them; discal interspaces totally occupied by a creamy white band which is widest (8 mm.) at costal margin, measures 3 mm. before  $R^3$ , and  $1\frac{1}{2}$  mm. behind  $R^3$ , and widens out again at abdominal margin; postdiscal interspaces small pale buff; no admarginal spots and admarginal bars marked, but creamy white submarginal spots as above, anal submarginal dots larger than above, both tails broad, triangular, blunt, upper one 3 mm., second  $1\frac{2}{3}$  mm. long.

Length of forewing: ♀, 39 mm.

$R^3$  of hindwing M at base of  $M^1$ .

*Hab.* Island of St. Thomé, 1 ♀ in coll. Staudinger.

This is a very remarkable species; its greatest peculiarity is the position of the large admarginal halfmoons of the hindwing.

d. Cell-bars of forewing below straight, with heavy white borders, or bar 4 all white, discal bars of forewing straight.

e<sup>1</sup>. Basal area of upperside of wings milky white like body.

#### 49. *Charaxes lactetinctus*.

♂. *Charaxes lactetinctus* Karsch, *Ent. Nachr.* XVIII. p. 113. n. 1 (1892); id., *Berl. Ent. Zeitschr.* XXXVIII. p. 190. n. 53. t. 5. f. 3 (1893) (Adeli, Sept. October); id., *l.c. Sitz.-Ber.* p. 19 (1894); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 365. n. 37 (1896) (Adeli); Auriv., *Kongl. Sc. Vet. Ak. Handl.* XXXI. p. 234. n. 17 (1899) (Togo).

♂ ♀. *Upperside* of palpi, head, pronotum and tegulae tawny, rest of upperside milky white; antennae black; *underside* of palpi pale tawny, with a black lateral line which is bordered pale yellow ventrally; sternae and legs russet, femora more black, abdomen in ♀ white, tawny in middle, with an interrupted black streak at each side.

♂. *Wings above*: basal half of forewing and basal two-thirds of hindwing bluish white.—Forewing: tawny, the white area not reaching  $SC$ , externally oblique; bar D heavy, triangular, median bars  $R^3$ — $SM^2$  forming large continuous patches, black, median bars  $SC^{45}$ — $R^2$  also black, heavy, elongate, contiguous; discal and postdiscal patch-like bars less deep black, discal ones  $SC^3$ — $R^3$  forming a large triangular patch pointing backwards, patch  $R^2$ — $R^3$  more proximal, subrectangular, contiguous with the black median patch  $R^3$ — $M^1$ ; postdiscal brownish black patches merged together to a band which widens posteriorly, and is produced towards the margin of the wing at the veins; the orange tawny discal interspaces  $SC^1$ —( $SM^1$ ) smaller than the postdiscal brownish black patches, separated from each other at the veins, the upper ones more or less rounded, the series almost parallel to outer margin; admarginal, tawny, spots about as large as the discal ones, convex proximally, upper ones not clearly separated from one another.—Hindwing: white area posteriorly wider than in front, its outer edge crossing  $R^3$  proximally of bent; discosubmarginal bars enlarged and merged together to a very broad black band, which includes the whitish violet blue submarginal dots  $R^1$ — $SM^2$  close to its outer edge; postdiscal interspaces  $C$ — $R^1$  tawny about 2 mm. wide before  $SC^2$ ; orange tawny



admarginal interspaces transverse, upper one largest, middle ones about  $1\frac{2}{3}$  mm. wide, interspaces  $R^3-M^2$  strongly constricted between veins, anal one olive buff; admarginal line black.

*Underside* chestnut.—Forewing: postdiscal and marginal interstitial bands tawny, the former about 3 mm. wide at  $(SM^1)$ , narrowing costad, the latter wider in middle than behind: cell-bars transverse, bar 2 and 3 with rather thin white borders, bar 4 all white, the black scaling being obliterated; bar D thin; submedian bars  $M^1-(SM^1)$  heavy, the upper one with a heavy white proximal border, this border just behind point of origin of  $M^1$ , submedian bar  $(SM^1)-SM^2$  more or less marked, as is also the subbasal bar; median bars  $R^3-SM^2$  subcontinuous, the series crossing  $M^1$  about 8 mm. from the base of that vein, no median bar  $R^2-R^3$ , black median bars  $SC^3-R^2$  also obliterated, but their white distal borders developed to a triangular patch; postdiscal bars  $R^3-SM^2$  more or less black, patch-like, bordered distally by a bluish grey scaling which forms a narrow band that extends to near costal margin, but becomes anteriorly more olive and less distinct.—Hindwing: all the basal to postdiscal bars absent, except discal bar  $(SM^1)-SM^2$  which is black, but the position of the median, discal and postdiscal series of bars is indicated in consequence of the difference in tint of the discal, postdiscal and submarginal interspaces, the discal and submarginal interspaces forming two somewhat greyish brown bands, while the postdiscal interspaces are merged together to a chocolate band; this latter band is of about 4 mm. width in middle, crosses  $SC^2$  about 10 mm. from end of vein and thence runs towards anal angle; submarginal black bars  $R^3-SM^2$  represented by black dots which are bordered bluish white proximally, similar bluish white, but less distinct, lunules also between C and  $R^3$ ; admarginal interspaces as above, rather wider (except upper one) less bright orange tawny, interspaces  $R^3-M^2$  yellowish in middle; marginal line blackish brown; abdominal area tawny; tails triangular, second longer than first, length 5 resp. 7 mm.

♀. Like ♂, wings somewhat broader, tawny orange postdiscal interstices of forewing *above* wider; on the *underside* the median bars  $R^3-M^2$  of forewing closer to cell than to postdiscal bars (in ♂ the reverse is the case), on hindwing the chocolate postdiscal band more proximal, proximally bordered by a distinct grey line, discal interspaces C- $R^3$  orange.

Length of forewing: ♂, ♀, 40–45 mm.

*Hab.* Togoland: Adeli, found in September and October, not rare according to the discoverer. A ♀ in the British Museum found between Scaresies and the Niger.

*f*<sup>1</sup>. Basal areas of wings above not white.

*g*<sup>2</sup>. Costal median bar of hindwing below absent.

*i*<sup>3</sup>. Dentition of outer margin of hindwing not prominent, no tail  $M^1$ .

*g*<sup>4</sup>. Forewing above: cell with a black subapical patch, post-costal median and discal interspaces more or less orange.

## 50. *Charaxes druceanus*.

*Charaxes druceanus* Butler, *Cist. Ent.* I. p. 4. n. 1 (1869) (O. Calabar); id., *Lep. Ex.* p. 26. t. 10. f. 4. ♂ (1870) (O. Calabar); Spiller, *Entom.* XV. p. 8 (1882) (Natal); Westw., *Thes. Oxon.* p. 182. t. 34. f. 6. ♂ (1874) (Old Calabar, Natal, Zambesi); Stand., *Exot. Tagf.* p. 169 (1886) (Natal); Trim. & Bowker, *S. Afr. Butt.* I. p. 329. n. 108 (1887) (Natal; Transvaal; Zambesi);

Angola); Butl., *Proc. Zool. Soc. Lond.* p. 252. n. 7 (1895) (Zomba, ♀); id., *l.c.* p. 720. n. 6 (1895) (Zomba); id., *l.c.* p. 110. n. 7 (1896) (Nyassa, IV.; Nyika); id., *l.c.* p. 822. n. 10 (1896) (Lumpi R., Lower Nyika, XI.); id., *Journ. Linn. Soc. Lond.* XXV. p. 351. n. 3. (1896) ("O. Calabar" and "Gaboon" *loc. err.?*; Zomba; Orange R.; Kaffraria; Nyika; Nyassaland); Dist., *Ann. Mag. N. H.* (7). I. p. 51 (1898) (Limpopo R.); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 233. n. 11 (1899) ("O. Calabar"; Gaboon; Congo; Angola; Natal; Transvaal; Nyassaland; Zambesi).

*Charaxes cinadon* Hewitson, *Ent. Mo. Mag.* VI. p. 177 (1870) (Natal).

*Nymphalis druceanus*, Kirby, *Cat. Diurn. Lep.* p. 268. n. 12 (1871) ("O. Calabar"; Natal); Dewitz, *Nov. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 28 (1879) (N. Angola).

♂ ♀. Body as in *pollux*, but upperside varying from chestnut brown to orange tawny.

♂. *Wings above* similar to those of *pollux*, basal area varying from chestnut brown to ochraceous tawny, band better defined than in *pollux*, its width variable,  $3\frac{1}{2}$  to  $5\frac{1}{2}$  mm. at SM<sup>2</sup> of forewing.—Forewing: cell-bar 3 sometimes vestigial, more or less obviously showing through from the underside, cell-bar 4 transverse, about 2 mm. broad, not reaching M, but posterior part often vestigial; submedian bars M<sup>1</sup>—SM<sup>2</sup> absent or faintly vestigial; median bar M<sup>1</sup>—SM<sup>2</sup> mostly absent, sometimes marked as a heavy line, bars R<sup>3</sup>—M<sup>2</sup> developed to patches which extend often to cell, situated as in *Ch. phoebus*, median bar R<sup>2</sup>—R<sup>3</sup> fused with bar D as in *pollux*, median bars SC<sup>5</sup>—R<sup>2</sup> heavy, sometimes extended basad to cell, bar SC<sup>4</sup>—SC<sup>5</sup> also present, elongate; discal bars SC<sup>4</sup>—R<sup>2</sup> or SC<sup>4</sup>—R<sup>1</sup> fused to a heavy triangular patch, bar R<sup>1</sup>—R<sup>2</sup> if isolated very small, bar R<sup>2</sup>—R<sup>3</sup> often absent, but if present always situated close to median bars SC<sup>5</sup>—R<sup>2</sup>, in the darkest individuals it is joined to these bars as well as to discal bars SC<sup>4</sup>—R<sup>2</sup>; ochraceous rufous or tawny admarginal spots large, well defined, rounded proximally.—Hindwing: tawny ochraceous or orange tawny discal band narrowing behind, with a darker tawny outer border; black postdisco-submarginal band almost straight proximally, its inner edge crossing R just at or a little beyond bent of that vein; pale blue submarginal dots R<sup>3</sup>—SM<sup>2</sup> present, last one largest; admarginal spots ochraceous rufous or tawny, slightly separated at veins, or contiguous, spot SC<sup>2</sup>—R<sup>1</sup> two to four times as wide as the black marginal line, anal one thin, more or less olive.

*Underside* reddish chestnut or ferruginous; bars nearly as in *pollux*, somewhat wider, especially their silvery white borders.—Forewing: median bar R<sup>2</sup>—R<sup>3</sup> seldom separated by a small, short, white, spot from bar D, median bars SC<sup>4</sup>—R<sup>2</sup> partly obsolete, their white borders fused to a band of even width, about 3 mm. broad, which is joined to the white disco-postdiscal band, median bars R<sup>3</sup>—M<sup>2</sup> very heavy, the upper 5 mm. from base of M<sup>1</sup>; discal bars SC<sup>4</sup>—R<sup>1</sup> olive, obsolescent, white band sharply defined, 4 to 5 mm. broad at (SM<sup>1</sup>), 3 mm. at fold R<sup>3</sup>—M<sup>1</sup>, 4 mm. between R<sup>2</sup> and R<sup>3</sup>, of about even width ( $2\frac{1}{3}$  mm.) from R<sup>2</sup> to SC<sup>4</sup>, pinkish posteriorly, separated from the series of black postdiscal spots by a chestnut or orange rufous band, which becomes paler behind, where it is as broad as the white band; postdiscal bars patch-like, gradually decreasing in size towards costa, patches R<sup>3</sup>—M<sup>2</sup> almost touching one another, all bordered white or bluish white distally, the white border of double patch M<sup>2</sup>—SM<sup>2</sup> resembling the number 3, borders R<sup>2</sup>—M<sup>2</sup> generally also of a similar shape, the black patches being distally slightly sinuate in middle, upper patches more or less transverse, proximal edge of patches SC<sup>4</sup>—M<sup>1</sup> sometimes also with thin but obvious white border; admarginal interspaces larger than above, but more ill-defined.—Hindwing: black bars not heavier than their white borders, basal costal bar linear; upper two black submedian

bars absent, their white borders fused to a band of 2 to 3 mm. width which is continuous with the cell-bar 2; upper three (or more) black median bars absent, their white borders fused with the white discal band, but partly separated from it by tawny chestnut spots, white borders of cell-bar 4, bar D and median bar  $R^2-R^3$  fused together at  $R^2$ , submedian bar  $M^2-(SM^1)$  nearly longitudinal, joining line  $(SM^1)$ , median bar  $M^2-(SM^1)$  more distal than in *pollux*, continuous with median bars  $(SM^1)-SM^3$  which join together the ends of the abdominal lines; white discal band inclusive of white borders of median bars 6 mm. wide at C, strongly narrowing behind; of the discal series of black bars only those beyond  $M^2$  are present, forming a nearly straight line at the outer edge of the white band; the interspace between the white submedian and mediano-discal bands 4 to 5 mm. broad at  $SC^2$ , rather regular in shape down to M; postdiscal interspaces fused to a band of the same colour as the basal area of the wing; postdiscal black bars varying in width, more or less uniform, heavily bordered with white distally, position of bars nearly as in *pollux*, bars  $R^1-R^3$  being more distal than the others, bar  $M^1-M^2$  closer to submarginal one than in *pollux*; submarginal bars transverse, the upper one or two uniform, concave distally, bars  $M^1-SM^2$  also somewhat arched, concave proximally, the last fused with postdiscal ones to a ring (or double ring), filled up with olive (which is often the case with the ovate interspace between postdiscal and submarginal bars  $M^1-M^2$ ) and including two white and blue dots, but no white scaling at postdiscal bar, submarginal bars C— $M^2$  heavily bordered white proximally, thinly so distally, bar  $M^1-M^2$  generally with a blue dot in white scaling; submarginal interspaces less bright in colour than the postdiscal band, more or less cinnamon rufous; admarginal interspaces rectangular, upper one halfmoon-shaped, contiguous, ferruginous tawny, the posterior ones pale ochraceous; black marginal line thinly but obviously edged with white; edge of wing much less sharply dentate than in ordinary *pollux*, agreeing in this respect with *phoebus*, tooth  $M^1$  very short, rounded, tail  $R^3$  4 to  $5\frac{1}{2}$  mm. long, second 5 to 6 mm.

♀. Like ♂, larger, discal band of upperside paler, sometimes buff yellow, tails very long, slender, but less pointed than in *pollux* and allies, tail  $R^3$  9 to 10 mm., tail  $M^2$  9 to 10 mm. long.

Length of forewing: ♂, 35—40 mm.

“ ” ♀, 42—48 mm.

Penis thick, a large subapical tooth with several small ones close behind.

*Hab.* “Old Calabar,” “Gaboon,” according to Butler; Congo, Angola, Nyassaland, Zambesi, Natal. In the Tring Museum 3 ♂♂, 3 ♀♀ from: South of Congo, Congo Free State; Zomba, December 1895 (Dr. Percy Rendall); Lauderdale; Karkloop, Natal, April.

The Natal specimens have the black colour of the upperside on the whole rather more extended than the individuals from Angola and the Congo, and the discal interstitial band is paler orange. Whether the species really extends to Old Calabar, whence the type is said to be from, is more than doubtful.

♂. Forewing above: no cell patch, median, discal and postdiscal bars all merged together to a large black area, which is narrow behind.

51. *Charaxes eudoxus* (Nov. Zool. VI. t. 8. f. 3. ♂).

*Papilio Eques Achivus eudoxus* Drury, *Illustr. Es. Ins.* III. p. 44 and Index. t. 33. f. 1. 4 (1782)  
(S. Leone).

♂. Body similar to that of *druceanus*.

*Wings above*: basal area chestnut.—Forewing: chestnut colour of base extending to vein  $M^1$ , shading into the blackish brown colour of the disc; bar D anteriorly partly free, but median and discal bars not or scarcely traceable: a disco-postdiscal band orange rufous, tapering costad, separated into spots except behind, its distal edge about parallel to outer margin: a series of admarginal spots of the same colour.—Hindwing: blackish brown before cell; abdominal fold greyish basally, pale orange rufous distally; discal band orange rufous, deeper in tint behind where it gradually shades off into the rufous chestnut postcellular area, somewhat constricted at  $SC^3$ , postdisco-submarginal band brownish black, sometimes almost separated into spots, proximally convex, distally concave between veins; admarginal interspaces broad, 3 to 4 mm., halfmoon-shaped, either separated by the black veins, or fused to a continuous band; marginal line black; fringe white between veins.

*Underside*: chestnut, from pale chestnut to tawny ochraceous in outer marginal region of forewing; bars black, bordered with white.—Forewing: cell-bar 2 circular, 3 elongate, oblique, 4 transverse, thin, close to bar D; submedian bar  $M^1$ — $M^2$  heavy, just behind base of  $M^1$ , bar  $R^3$ — $M^1$  present in angle of veins  $R^3$  and  $M^1$ ; submedian and median bars  $M^1$ — $SM^2$  fused together to a large patch, median bars  $R^3$ — $M^2$  more distal than in all the allied species (except *luctetinctus*), bar  $R^3$ — $M^1$  being about 9 mm. distant from base of  $M^1$ , white edges of these long bars comparatively thin, median bar  $R^2$ — $R^3$  fused with bar D, bars  $SC^4$ — $R^2$  partly obsolete, but their white borders fused to a nearly straight band: discal bars absent, but their white borders present as a double series of very thin white lines from  $SC^4$  to  $M^1$ , the last touching median bar, discal interspaces  $M^4$ — $SM^3$  pale ochraceous, fused with the postdiscal interspaces; postdiscal black bars represented by black spots, spots  $SC^4$ — $M^1$  rather small, the others larger and confluent, all distally sinuate upon internervular fold, distally bordered with white, this scaling forming M-shaped markings between  $R^2$  and  $M^1$ , while between  $M^2$  and  $SM^2$  (where it is bluish) it forms two or three dashes; admarginal interspaces rather large, pale ochraceous behind, more tawny ochraceous anteriorly.—Hindwing: black bars all very thin as in *druceanus*, the subbasal black and white bars  $SC$ —( $SM^1$ ) continuous with the submedian bars in front of  $SC$  and  $C$ , the latter two broad, their black central lines in the southern subspecies absent, forming a purely white band which stands close to  $PC$  at  $C$ ; cell-bar 4, bar D and median bar  $R^2$ — $R^3$  placed as in *pollux*, joined together at  $R^2$ ; black median bars partly absent; white discal band considerably narrower than in *druceanus*, including a series of tawny patches which divide the white band into a proximal line, which represents the white borders of the median bars, and a distal line, which represents the white borders of the discal bars; postdiscal bars  $C$ — $R^2$  as triangular spots, the others transverse, linear, thin, all bordered with bluish white lines distally which, at veins  $SC^3$  and  $R^1$ , form obvious angle-shaped markings similar to those of *C. pelias* and allies; submarginal bars thin, sometimes curved, edged white (or bluish white) proximally; submarginal interspaces dark cinnamon rufous, narrower than the admarginal ones, at least interspaces  $R^2$ — $M^2$ ; admarginal interspaces ochraceous, or tawny ochraceous, rather



narrower than above; anal ring small, olivaceous with two white submarginal dots; edge of wing dentate as in *druceanus*, tails pointed.

♀. Essentially like ♂, tawny band of forewing, above, wider.

Length of forewing: ♂, ♀, 40—43 mm.

*Hab.* Sierra Leone to Northern Angola. A rare species in collections. Dr. Butler, in his Revision of the genus *Charaxes*, said, that "up to the present time Drury's figures are all that remain to show us what this species is like." However, up to 1896 (the date of publication of the *Revision*) *Ch. eudoxus* had already been recorded again by Möschler from Ashanti and by Dewitz from Angola. Dr. Pogge obtained apparently quite a number of specimens in Northern Angola.

#### a. *Ch. eudoxus eudoxus*.

*Papilio Eques Achivus eudoxus* Drury, l.c. (Sierra Leone).

*Papilio Nymphalis eudoxus*, Fabricius, *Ent. Syst.* III. 1. p. 65. n. 203 (1793).

*Nymphalis eudoxus*, Godart, *Enc. Méth.* IX. p. 352. n. 6 (1823); Doubl., Westw. & Hew., *Gen.*

*Diurn. Lep.* II. p. 309. n. 12 (1850); Kirby, *Cat. Diurn. Lep.* p. 268. n. 9 (1871).

*Charaxes eudoxus*, Butler, *Proc. Zool. Soc. Lond.* p. 626. n. 10 (1865); id., *Cat. Diurn. Lep. descr. by Fabr.* p. 53. n. 13 (1869); Möschl., *Abh. Senk. Gesellsch.* XV. p. 61. n. 98 (1890) (Aburi); Auriv., *Ent. Tidskr.* XV. p. 310. n. 187 (1894) (♀ similar to ♂); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 352. n. 7 (1896); Auriv., *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 233. n. 12 (1899) (S. Leone; Ashanti; Kamerun; non Angola).

♂. Orange rufous band of forewing extending to SC<sup>4</sup>, four upper partitions separated from one another; black postdisco-submarginal band of hindwing considerably broader than orange rufous admarginal band, the latter consisting of halfinoous which are not completely fused together. On the *underside*, black submedian and median bars of forewing M<sup>1</sup>—M<sup>2</sup> elongate; two upper black submedian bars of hindwing as well as black costal median bar present.

♀. Similar to ♂ (see above).

*Hab.* Sierra Leone; Ashanti; Cameroons. A ♂ agreeing with Drury's figure is in the Oxford Museum; a ♂ from Buea, Cameroons, in Dr. Standinger's collection; a specimen from Aburi, Ashanti, in the Senkenbergische Museum at Frankfurt-on-the-Maine.

#### b. *Ch. eudoxus mechowii* Oberthür i. l. (Nov. Zool. VI. t. 8. f. 3).

*Nymphalis eudoxus*, Dewitz (non Drury, 1782), *Nov. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 17 (1879) (N. Angola).

*Charaxes eudoxus*, Aurivillius, *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 233. n. 12 (1899) (pt.; Angola).

♂. Band of forewing *above* about 6 mm. distant from tip of vein SM<sup>2</sup>, strongly tapering costad, stopping at SC<sup>5</sup>, four upper spots small, luniform (*type*) or rounded elongate. Black postdisco-submarginal band of hindwing interrupted at veins R<sup>3</sup> to M<sup>2</sup>, or M<sup>1</sup> and M<sup>2</sup>, anteriorly as wide as, or a little wider than posteriorly, considerably narrower than the admarginal band. On *underside* the submedian and median bars M<sup>1</sup>—M<sup>2</sup> very heavy, patch-like, black costal and subcostal bars of submedian and median series absent.

♀. Not known.

Length of forewing: ♂, 43 mm.

*Hab.* Northern Angola (Mecho), 1 ♂ (*type*) in coll. Oberthür; Beni Bendi, Sankrn, Congo Free State (L. Cloetens, January 1895), 1 ♂, in Mus. Bruxelles;

1 ♂ in coll. H. Adams (from coll. Honrath) without locality, but doubtless collected by Major Mechow or Dr. Pogge in Northern Angola; 2 ♂♂ from Northern Angola ("Guinea inf." Pogge) in Dr. Standinger's collection, also in the Berlin Museum from the same country.

*Ch. eudoxus* connects *druceanus* with the allies of *Ch. jason* in the pattern of the *underside*.

*j*<sup>3</sup>. Dentition of hindwing strong, tooth M<sup>1</sup> prolonged to a tail.

## 52. *Charaxes andranodorus*.

*Charaxes cinadon*, Butler (non Hewitson, 1870); *Aun. Mag. N. H.* (5). V. p. 335. n. 12 (1880) (Fianarantsoa).

*Charaxes andranodorus* Mabilie, *Bull. Soc. Ent. Belg.* XXVIII. p. 184 (1884) (Madagasc., ♂); id., in Grandid., *Hist. Madag.*, Lép. I. p. 182. n. 3. t. 21. f. 1. 1a, ♀, t. 25 a. f. 1. 1a, ♂ (1885-87) (Madag.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 351. n. 4 (1896) (Fianarantsoa; Ankafana, Betsileo); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 233. n. 10 (1899) (Madag.).

*Charaxes zoippus* Mabilie, *Bull. Soc. Ent. Belg.* XXVIII. p. 184 (1884) (Madag.); id., in Grandid., *Hist. Mad.*, Lép. I. p. 179. n. 2. t. 25. f. 2. 2a (1885-87) (Madag.).

*Charaxes spec.*, Oberthür, *Bull. Soc. Ent. Fr.* p. 11 (1888).

♂. Body *above* deep ferruginous, white line behind eye conspicuous, dots on head obliterated; *underside* brighter ferruginous; palpi with a very broad pure white lateral band which does not quite reach tip of second segment, no black line on this segment, apical segment very short, black, with a few ferruginous scales below; sterna with black, brown and white oblique bands, abdomen with a black medial stripe, broad at base, edges of segments in this stripe white, this scaling extended laterally to a white stripe; anterior legs white beneath, deep black above, the other legs white, femora black above, with dispersed white scales.

*Wings above* reddish ferruginous, markings deep black.—Forewing: cell-bar 3 and 4 present, the former the smaller of the two, both more or less triangular, not reaching M; bar D very heavy, narrower between R<sup>2</sup> and R<sup>3</sup> than in front; no submedian bar, but median bars very heavy, bars M<sup>2</sup>—(SM<sup>1</sup>) and (SM<sup>1</sup>)—SM<sup>2</sup> more or less longitudinal, not fused together, bar M<sup>1</sup>—M<sup>2</sup> a large patch, somewhat concave distally, convex proximally, anteriorly touching M, bar M<sup>1</sup>—M<sup>2</sup> a similarly shaped patch, more distal, occasionally dilated to base of M<sup>2</sup>, and then touching bar D, no median bar R<sup>2</sup>—R<sup>3</sup>, bars SC<sup>4</sup>—R<sup>2</sup> fused to a patch of variable size, sometimes produced basad to bar D, but often band-like, to it is joined discal bar R<sup>2</sup>—R<sup>3</sup> which is much more proximal than discal bars SC<sup>4</sup>—R<sup>2</sup>, these latter three bars continuous, forming a triangular band which is joined along veins SC<sup>4</sup>—R<sup>3</sup>, as is bar R<sup>2</sup>—R<sup>3</sup> along R<sup>2</sup>, to black postdisco-marginal band, reddish ferruginous interspaces SC<sup>4</sup>—R<sup>3</sup> almost or completely isolated, smaller than the discal interspaces SC<sup>5</sup>—R<sup>2</sup>; postdisco-marginal black band somewhat wider behind than in front, the black scaling produced basad at veins, hence the reddish ferruginous discal interspaces R<sup>3</sup>—M<sup>2</sup> partly isolated, interspace M<sup>2</sup>—SM<sup>2</sup> about as wide at (SM<sup>1</sup>) as black band; the band includes a series of reddish ferruginous marginal spots which are not so wide as their black interspace, more or less rounded, the upper ones somewhat elongate, spots M<sup>2</sup>—SM<sup>2</sup> separate.—Hindwing: basal area in and behind cell somewhat tawny, bases of cellules C—R<sup>1</sup> with purplish black patches, some black scales occasionally also before base of R<sup>2</sup>, bar D vestigial in front in some individuals; median area bright orange in front; disco-marginal

area black, somewhat sinuate between veins, extended to base of  $M^1$ , suddenly narrowed from ( $SM^1$ ) to abdominal margin, the discal portion of the black area being represented beyond ( $SM^1$ ) by an obscure bar which separates an ochraceous, triangular patch from the rest of the abdominal fold; two blue submarginal dots  $M^2$ — $SM^2$ ; admarginal interspaces  $M^2$ — $SM^2$  mostly fused to a rather thin yellowish or bluish olive buff line, the other admarginal interspaces not marked, or interspaces  $C$ — $R^3$  represented by thin, ochraceous or tawny, lunules.

*Underside* deep ferruginous, changing into ochraceous towards abdominal angle of hindwing and into ferruginous orange on forewing at outer margin and posteriorly on disc; white lines and bands silvery white, glossy, bars black.—Forewing: cell-bars inclusive white borders wider than interspaces, black bar 4 about  $2\frac{2}{3}$  mm. broad at widest point; submedian and median bars  $M^2$ — $SM^2$  merged together to a large patch, bars  $M^1$ — $M^2$  also confluent, but generally divided in front by a white line, median bar  $R^3$ — $M^1$  17 mm. from base of cell, much more distal than bar  $M^1$ — $M^2$ , median bar  $R^2$ — $R^3$  fused with bar D, but in most examples there is a white spot behind  $R^2$  which partly isolates bar  $R^2$ — $R^3$ , bars  $SC^4$ — $R^2$  less heavy, upper one a mere dot, white borders forming a band which is as wide as the ferruginous interspace at its proximal side, that band at right angles to costa as in *phraortes*, hence much less directed apical than in *druceanus*, joined at  $R^2$  to white discal band, which is from  $SC^4$  to  $R^3$  little wider than postdiscal ferruginous band, includes between  $R^3$  and  $SM^2$  a series of more or less conspicuous ferruginous spots or lines or patches which partly or totally separate the white distal borders of the median bars from the discal band, and is distally sinuate upon veins; discal black bars  $SC^4$ — $R^1$  present; postdiscal bars  $SC^3$ — $R^3$  more or less transverse, bar  $R^1$ — $R^2$  generally rounded, bars  $R^3$ — $SM^2$  larger, straight proximally, rounded distally, bars  $M^2$ — $SM^2$  nearly completely fused together, but division obvious, bars  $SC^3$ — $M^2$  each with a sharply defined silvery white patch at outside; patches  $R^1$ — $M^2$  halfmoon-shaped, patches  $SC^4$ — $R^1$  larger than the others, the uppermost elongate ovate, these patches represented between  $M^2$  and  $SM^2$  by bluish white, less sharply defined, spots; veins black at extremities, this scaling extended basad to postdiscal black bars, at least at veins  $M^1$ — $SM^2$ , within this black scaling stands upon each vein a conspicuous, silvery white, dash or elongate ovate spot, veins ( $SM^1$ ) and  $SM^2$  excepted.—Hindwing: costal submedian and upper two or three median black bars absent; basal costal bar inclusive white border more or less ovate, the white border often extended to PC and base of C; white borders of upper two submedian bars, cell-bar 2, and subbasal bar  $M$ —( $SM^1$ ) fused to a band which stops at ( $SM^1$ ), the ferruginous subbasal interspace continuous with the ferruginous line near basal abdominal margin and joined along ( $SM^1$ ) to the ferruginous mediano-submedian interspace which itself stands in connection with the disco-postdiscal ferruginous interspace, being continued along ( $SM^1$ ); white costal median spot either isolated, or joined to the white submedian band; a broad white band occupies the middle of the wing, this band is convex proximally, slightly biconcave distally, narrowed almost into a point at ( $SM^1$ ), broadest between  $R^2$  and  $R^1$ , about 9 mm., it consists of the white borders of the median and discal bars plus the interspaces between these bars which are also white, only the costal discal interspace being mostly ferruginous, and being joined across C to the ferruginous mediano-submedian ferruginous band; the white band includes cell-bar 4, submedian bar  $M^1$ — $M^2$  close to base of  $M^2$  and submedian bar  $M^2$ —( $SM^1$ ), further median bars  $C$ — $R^1$ , which are small and sometimes absent, median bar

$R^1-R^3$ , which is heavy and stands very little distally of base of  $M^1$ , short median bar  $R^3-M^1$ , long and oblique median bar  $M^1-M^2$  and short bar  $M^2-(SM^1)$  which points basad: upon this band follows a ferruginous band which is proximally slightly biconvex, distally irregularly biconcave, postdiscal black bars  $C-R^1$  vestigial at outer edge of this band, bars  $M^2-SM^2$  marked; submarginal bars conspicuous, transverse, slight curving distad, bars  $M^2-SM^2$  much more distal than bar  $M^1-M^2$ , submarginal interspaces silvery white, except interspaces  $M^2-SM^2$  which are olive black, including two blue and white dots, these last interspaces not so white as the preceding ones; admarginal interspaces ochraceous, anal ones fused together, greenish, with white triangular spots distally at veins  $C-M^2$ ; black marginal line broader between than at veins; black abdominal lines without ferruginous interspaces between, joined together at ends by means of the median bars; discal bars  $(SM^1)-SM^3$  present, interspace between them and respective median bars silvery white, discal bar  $M^2-(SM^1)$  vestigial or distinct, short; edge of wing very strongly dentate; tails long, slender, pointed, tail  $R^3$  8 mm., tooth  $M^1$  4 mm., tail  $M^2$  9 mm.

♀. Like ♂, larger, paler ferruginous, ferruginous admarginal interspaces of hindwing all marked, but interspaces R<sup>3</sup>—M<sup>2</sup> divided between veins into long triangular spots standing along veins; tails longer than in ♂; subbasal ferruginous band of hindwing below not joined along (SM<sup>1</sup>) to submedian band of same colour.

Length of forewing: ♂, 50 mm.

♀, 55 mm.

Penis very slender, not dilated at apex as in *druceanus*, with a small tooth 1 mm. from end.

*Hab.* Madagascar : Fianarantsoa ; Ankafana, Betsileo.

Mabille's *Charaxes zoippus* is nothing else but *andranodorus*; the figure of the ♂ of *andranodorus* in *Hist. Nat., Lép.* is drawn from a specimen of which tail M<sup>2</sup> was broken. The species is apparently rare, as it is represented in few collections by anything like a series.

*h*<sup>2</sup>. Costal median bar of hindwing below present.

*k*<sup>3</sup>. Black postdiscal bars of hindwing below well marked, convex proximally.

*i*<sup>4</sup>. Wings above tawny, at least discal band of forewing.

*g*<sup>5</sup>. Submarginal interspaces of hindwing below silvery white all over.

53. *Charaxes phraortes*.

*Charaxes phraortes* Doubleday, *Ann. Mag. N. H.* XX. p. 60 (1847) (Madagascar); Butl., *ibid.* p. 625. n. 6 (1865) (Madag.); Guen., in Vinson, *Voy. Madag., Annexe* F. p. 28 (1865); Butl., *Lep. Exot.* p. 26. t. 10. f. 6 ♀ (1870); Saalm., *Lep. Mus.* p. 86. n. 123 (1884) (Madag.); Mab., in Grandid., *Hist. Mus., Léop.* I. p. 177. n. 1. t. 25. f. 1. 1a (1887) (Madag.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 352. n. 5 (1896) (Madag.); Auriv., *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 233. n. 7 (1899) (Madag.).

*Nymphalis phraortes*, Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 22 (1850) (Madag.); Kirby, *Cat. Diurn. Lep.* p. 267. n. 6 (1871) (Madag.; *cit. fals.!*).

♀. *Body above* tawny ferruginous, dots on head not obvious, white line behind eye conspicuous; *underside* ferruginous, middle line of pro- and mesosternum and three oblique lateral lines on meso- and metasternum white; palpi with a broad white stripe which does not quite reach tip of second segment, third segment all



black, second without black line ; anterior leg black above, white beneath, the other legs dirty white, femora black above, with dispersed, white, scales ; abdomen pale ochraceous, whitish towards base, sides with ill-defined black and white scaling.

*Wings above* : base tawny ferruginous, rest ferruginous orange, marked with black patches and bands.—Forewing : all the bars very heavy ; cell-bars 3 and 4 represented by patches which do not reach M, upper patch much heavier than the other ; submedian bar  $M^1-M^2$  present, in front of median bars  $M^2-SM^2$  ; median bars  $R^3-M^2$  very large,  $3\frac{1}{2}$  mm. broad, somewhat halfmoon-shaped, bar  $R^3-M^1$  more distal than the others, median bar  $R^2-R^3$  fused with bar D, forming with it a hammer-shaped patch, bars  $SC^4-R^2$  forming a similar mark, bar  $R^1-R^3$  being broader than the others touching the discal bar  $R^2-R^3$  ; discal bars  $SC^4-R^3$  present, halfmoon-shaped, joined along veins to black postdisco-marginal area, bars  $SC^4-R^1$  very much broader than bars  $R^1-R^3$  ; postdisco-marginal black area heavily dentate at veins  $R^3-M^2$  ; marginal ferruginous orange dots of nearly equal width, about 1 or  $1\frac{1}{2}$  mm. wide, postdiscal spots  $SC^4-R^3$  of that colour isolated, rounded, spot  $R^1-R^2$  small ; median series of bars extending generally beyond  $SM^2$ .—Hindwing : median bars  $C-R^1$  present, the second 3 mm. from base of  $R^1$ , the first 2 mm. more distal ; black postdisco-submarginal area only  $2\frac{1}{2}$  mm. from base of  $M^1$ , anteriorly narrower, measuring  $5\frac{1}{2}$  mm. between C and  $SC^2$ , black colour somewhat produced basad between  $R^2$  and  $R^3$  ; a complete series of ferruginous orange lunules, upper ones heavier, nearly 2 mm. broad between veins, all slightly separated at veins, black marginal line 1 wide, even in width.

*Underside* ferruginous chestnut ; bars deep black, much heavier than in *pollur.* white borders also heavy, silvery white.—Forewing : cell-bars 2 and 3 more or less circular, 4 also rounded off behind ; submedian and median bars  $M^2-SM^2$  fused to a large patch which extends to base, median bars  $SC^4-M^2$  placed as above, bar  $R^2-R^3$  more or less completely separated from bar D, but the white borders of these bars always fused ; pinkish white discal patches  $R^3-SM^2$  of almost the same width, each more or less rectangular, patch  $M^2-SM^2$  narrower than postdiscal ochraceous patch  $M^2-SM^2$  ; discal black bars  $SC^4-R^3$  present, bars  $R^1-R^3$  thin, the last of them close to median bar  $R^1-R^2$  ; postdiscal bars represented by black spots, spots  $SC^4-R^3$  small, smaller than the ochraceous spots at their proximal side, spot  $SC^4-SC^5$  a little larger, spot  $M^1-SM^2$  large, all with ochraceous spots resp. patches at proximal side, and all bordered outwardly by bluish grey, heavy, semicircles ; admarginal tawny ochraceous spots much larger than those of upperside, veins with black patches at ends, more or less covered with bluish grey scaling.—Hindwing : black bars up to median series inclusive of their white borders much broader than the ferruginous chestnut interspaces, which is especially obvious in cell ; median bar  $C-SC^2$  more distal than the median bars next to it, median bar  $R^2-R^3$  4 mm. distant from bar  $R^1-R^2$ , with a ferruginous spot between itself and bar D, median bar  $M^1-M^2$  long, oblique, pointing anad, median bars  $M^2-SM^3$  at right angles to veins, continuous, joined to the black abdominal lines, bar  $M^2-(SM^1)$  more proximal than bar  $(SM^1)-SM^2$  ; submedian bar  $M^2-(SM^1)$  long, extending straight from base of  $M^2$  to end of longitudinal line  $(SM^1)$ , the ferruginous chestnut interspace between the bar and this line a long narrow triangle ; no discal bars except a continuous, almost straight, transverse, very slightly oblique line from  $M^2$  to abdominal margin ; postdiscal interspaces beyond irregular, silvery white ; discal band ferruginous chestnut, this colour forming a band of about 3 mm. breadth, curved distad before  $R^3$ , partitions  $R^3-M^2$  halfmoon-shaped, partition  $M^2-SM^2$

ochreous; postdiscal bars vestigial, densely shaded with silvery white like the submarginal interspaces, bars  $M^2$ — $SM^2$ , however, marked; submarginal black bars transverse, not abbreviated at ends, but not continuous, as the preceding bar is always a little less distal than the following one; admarginal interspaces ochraceous, paler behind, whitish at tips of veins; black marginal line thinner than the black submarginal bars, edge of wing strongly dentate, as in *pollux*, with three tails, second the shortest.

♀. Larger.—*Wings above* rather paler than in ♂.—Forewing: median bar  $R^2$ — $R^3$  separate from bar D, submedian bar  $M^1$ — $M^2$  and median bars  $M^2$ — $SM^2$  wanting.—Hindwing: no median bars visible; middle admarginal spots rather larger than in ♂.

*Underside*: the ferruginous chestnut colour more extended, the white discal bands of both wings wider, the postdiscal ferruginous chestnut band of hindwing more broken into spots at veins, postdiscal bars of hindwing a little better marked, tail  $M^1$  shorter.

Length of forewing: ♂, 45 mm.

” ” ♀, 50 mm.

Penis as thick as in *Ch. jason*, less curved before end, one heavy dorsal tooth at bent, with another smaller one behind.

*Hab.* Madagascar. In the Tring Museum 1 ♂, without more precise locality. Kirby, *l.c.*, cites the *Proc. Zool. Soc. Lond.* as being the place where the species was described by Doubleday, and the authors who, after the publication of Kirby's Catalogue, mention *phraortes* have accepted that erroneous reference.

*h*<sup>5</sup>. Submarginal interspaces of hindwing below not white in centres.

*g*<sup>6</sup>. Admarginal patches of hindwing above large, veins between them heavily black; tooth  $M^1$  short, blunt; underside olive russet.

#### 54. *Charaxes phoebus*.

*Charaxes phoebus* Butler, *Proc. Zool. Soc. Lond.* p. 625. n. 8. t. 36. f. 2. ♂ (1865) (Abyssinia); Oberth., *Ann. Mus. Civ. Genova* XV. p. 167. n. 48 (1879) (♂, ♀; Shoa, July); id., *l.c.* XVIII. p. 728. n. 59 (1883) (Feleklek; Sciotalit, I. II. VI. VII. XII.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 352. n. 6 (1896); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 233. n. 9 (1899) (Abyssinia).

*Nymphalis castor* (sic!) var. *a. Char. phoebus*, Kirby, *Cat. Diurn. Lep.* p. 268. sub n. 7 (1871).

♂ ♀. *Body above* tawny russet, mesonotum with an olivaceous tint.

*Underside* olive russet; palpi with thin white line, third segment black, second with a black lateral stripe on free part, black and grey stripes underneath legs indistinct, middle of abdomen blackish in ♀, segments slightly edged with grey.

*Wings above* a little less bright than in *pollux*.—Forewing: cell-bar 4 short, narrow, bar D about 1 mm. wide in middle, dilated distad before and behind  $R^1$ ; median bars  $R^3$ — $M^2$  transverse, more distal than in *pollux* and thinner, median bar  $R^2$ — $R^3$  present, close to bar D, which it generally touches, or with which it is partly fused, bars  $SC^4$ — $R^2$  more distal than in *pollux*; discal bars  $SC^4$ — $M^2$  present, the posterior ones as small spots, bar  $R^2$ — $R^3$  extended basad, ill-defined bar  $SC^4$ — $SC^5$  also widened, but cellule  $SC^4$ — $SC^5$  orange between discal and median bars; postdisco-submarginal black band of nearly even width (4 to 5 mm.), incised at posterior veins, somewhat sinuate between upper veins, slightly widening from  $R^1$  to  $SC^4$ , strongly dilated basad before  $SC^4$ , upper veins somewhat scaled black,

separating the orange postdiscal band into spots, partition  $R^2-R^3$  of the same width as respective partition of black band, the preceding ones gradually somewhat smaller; orange admarginal spots becoming smaller costad, posterior ones about half the width of the black band, the spots separated by the black veins, spots  $M^2-SM^2$  fused, but incised distally upon ( $SM^1$ ).—Hindwing: ochraceous orange, discal band better defined than in *pollux*, median bar  $C-SC^2$  and bar D vestigial; postdisco-submarginal black band proximally convex between veins, distally slightly produced into points between veins, partition  $C-SC^2$  narrower than the others, the band only  $5\frac{1}{2}$  mm. at widest point, last partition almost isolated, including one minute and another larger pale blue submarginal dot; admarginal interspaces dark orange, separated by the rather thinly black veins, upper interspaces widest, measuring 4 to 5 mm. before  $SC^2$ , anal one narrowest,  $1\frac{1}{2}$  mm. broad, somewhat ochreous; black marginal line as in *druceanus*.

*Underside* olive russet; bars very much thinner than in *pollux*, white band of fore- and hindwing much better defined distally than in *pollux*, except from  $M^2$  to internal margin of forewing (where the band is pinkish).—Forewing: cell-bar 3 half the width (white border included) of olive russet interspace following it, black cell-bar 4 a very thin line; median bar  $R^3-M^1$  5 mm. from base of  $M^1$ , bar  $R^2-R^3$  partly separate from bar D, bars  $SC^4-R^1$  obsolete, bar  $R^1-R^2$  thin, olive, uniform, bright olive russet spots at outer side of median bars  $R^3-M^2$  as wide as bars inclusive white border; discal bars  $SC^5-M^1$  present, represented by rather ill-defined spots situated in middle of white band, bar  $SC^4-SC^5$  obliterate; postdiscal band following white band gradually narrowing costad, a little more ochraceous than basal area; postdiscal black spots smaller than clayish ochraceous admarginal ones, spots  $SC^4-SC^5$  and  $R^2-M^1$  very short and thin, almost obsolete, transverse, linear, only spots  $M^2-SM^2$  triangular, these two almost separate.—Hindwing: basal costal bar a dot; black lines with white borders of abdominal fold scarcely half the width of interspaces in middle; median bar  $M^1-M^2$  longer than in *pollux*, bar  $M^2-(SM^1)$  more distal than in that species; discal abdominal bar as in *pollux*, but thinner; postdiscal band russet, ochreous beyond  $M^2$ , somewhat incised at veins  $C-R^3$ ; postdiscal black bars very thin, halfmoon-shaped, bordered white as in *pollux*, but less heavily, last bar forming with submarginal one a ring-shaped patch which is well separated from the edge of the wing; submarginal bars also very thin, partly vestigial only; submarginal interspaces shaped as in *pollux*, but clayish bistre brown; admarginal interspaces clayish tawny ochraceous, ochreous beyond  $M^1$ , posterior ones wider than on upperside; marginal line very thin in front; dentition of wing nearly as in *pollux*, but tooth  $M^1$  shorter than teeth  $R^1$  and  $R^2$ , tail  $R^3$  5 mm, tail  $M^2$  4 mm.

♀. Larger than ♂. Discal band of forewing *above* paler, median bars  $R^3-M^2$  rounded, bar  $R^2-R^3$  separated from bar D, admarginal spots halfmoon-shaped, being concave proximally.—Hindwing: discal band cream colour, sharply defined, extending to abdominal margin,  $5\frac{1}{2}$  mm. broad at  $SC^2$ , of about even width from  $SC^2$  to  $M^2$ , followed by a tawny orange band, which is narrower than in ♂; black postdisco-submarginal band 7 mm. broad between  $SC^2$  and  $R^1$ , proximally less convex between veins, black colour somewhat produced basad upon veins, anal patch only  $3\frac{1}{2}$  mm. wide; admarginal spots somewhat paler than in ♂, also somewhat narrower, especially the posterior ones, anal one almost cream-colour; black marginal line about 1 mm. broad.

*Underside* as in ♂; postdiscal black spots of forewing a little less linear

submarginal interspaces of hindwing more scaled white at postdiscal and submarginal bars ; tails broader, upper one 7 mm. long, second 5 mm.

Length of forewing : ♂, 41 mm.

" " ♀, 47 mm.

*Hab.* Shoa, Abyssinia ; found by Antinori in July at Mahal-Uong, Axaleua, Feleklek, and Scioatalit (= Shoatalit). In the Triug Museum 2 ♂♂, 2 ♀♀ from Shoatalit, Shoa, January, June, December (Antinori).

Antinori says that the species was attracted by exudations of a solanaceous plant.

*h*<sup>6</sup>. Admarginal patches of hindwing small ; tails acute, tooth M<sup>1</sup> pointed, underside red chestnut.

*e*<sup>7</sup>. Discal band of hindwing tawny or pale buff

### 55. *Charaxes pollux*.

*Papilio Eques Achirus pollux* Cramer, *Pap. Exot.* I. p. 61. t. 37. f. E. F (1775) (Guinea).

*Papilio Eques Achirus castor*, Fabricius (*non* Cramer, 1775), *Gen. Ins.* p. 251. n. 30. 31 (1776).

*Papilio Nymphalis Phaleratus camulus* Drury, *Illustr. Ex. Ins.* III. p. 41. t. 30. f. 1. 2 and Index (1782) (S. Leone).

♂. *Body above* tawny, darker in front than behind ; head with four rather indistinct dots and a postocular line white, a dorso-lateral stripe on second, and the whole third segment of palpi black ; *underside* tawny ochraceous ; palpi with a white lateral line ; breast with black streaks underneath legs, bordered with white, a white streak on mesosternum near base of wing ; anterior tibia and tarsus white beneath, black or brown above, the other legs clay colour, femora black above, with white dispersed scales ; abdomen with a white interrupted stripe at each side, which is broadest and most distinct at base, where the stripe is bordered black mesially.

*Wings, above* : basal area tawny, followed by a broad ochraceous orange disco-postdiscal band ; postdisco-marginal area black.—Forewing : cell-bar 4 represented by a heavy spot, bar D also heavy ; median bars R<sup>3</sup>—M<sup>2</sup> as heavy spots, spot R<sup>3</sup>—M<sup>1</sup> generally the larger, close to D<sup>3</sup>, median bars SC<sup>5</sup>—R<sup>2</sup> elongate, heavy, often prolonged basad to cell, followed behind R<sup>2</sup> by a streak which represents the median and discal bars R<sup>2</sup>—R<sup>3</sup> ; discal bars SC<sup>4</sup>—R<sup>1</sup> heavy, fused together, the upper one prolonged basad, completely (or nearly so) filling up the basal half of the cellule SC<sup>4</sup>—SC<sup>5</sup> ; the black colour extends generally also along SC<sup>5</sup>—R<sup>2</sup>, so that discal ochraceous orange spot SC<sup>5</sup>—R<sup>1</sup> and postdiscal ones SC<sup>4</sup>—R<sup>1</sup> are more or less isolated, all these patch-like bars black, discal bar R<sup>1</sup>—R<sup>2</sup> as well as R<sup>3</sup>—M<sup>1</sup> sometimes vestigial, minute ; black border of wing of about even width, 7 mm. broad at M<sup>1</sup>, inner edge concave between veins from SC<sup>4</sup>—R<sup>2</sup> or R<sup>3</sup> ; marginal dots generally present, pale orange, minute, the posterior ones the smallest as is the case in *Ch. brutus*.—Hindwing : discal area whitish towards costal margin ; black outer area widest in middle, its inner edge being nearly straight, not following the curve of the outer margin, 8 to 9 mm. broad between R<sup>2</sup> and R<sup>3</sup> ; pale blue submarginal dots M<sup>2</sup>—SC<sup>2</sup> present, mostly merged together ; admarginal spots absent or present, orange tawny, anal one olive buff ; fringe white between veins.

*Underside* red chestnut : bars heavy, black, heavily bordered with white, placed as in *brutus*.—Forewing : submedian and median bars M<sup>2</sup>—SM<sup>2</sup> generally



fused to a large patch ; discal bars  $SC^4-M^2$  or  $SC^4-M^1$  present, bar  $R^2-R^3$  behind the short band of median bars  $SC^4-R^2$ ; between short discal bars  $R^3-M^2$  and median bars are two ochraceous spots ; white band somewhat pinkish behind and gradually shading into the orange ochraceous postdiscal band ; postdiscal bars represented by black triangular patches which are bordered each with a grey, angle-shaped, line distally, the lines at internal angle pale blue, separated from one another between  $M^2$  and  $SM^2$  into three dashes ; veins with black patches at ends, patches  $R^1$  and  $R^2$  larger than the others, veins  $R^3-M^2$  generally with bluish white scaling before end.—Hindwing : basal costal bar somewhat bean-shaped ; white discal band about as broad as the orange ochraceous postdiscal one ; median bar  $M^1-M^2$  a little distal of base of  $M^1$  ; white band with a tawny patch at costal margin, followed generally by a series of smaller patches down to  $R^3$  ; no black discal bars except between  $M^2$  and abdominal margin, these contiguous with orange ochraceous postdiscal band, postdisco-marginal area of the same pattern and colour as in *Ch. brutus brutus*, submarginal interspace  $M^1-M^2$  chocolate ; chocolate interspace behind black line upon  $SM^2$  triangular ; edge of wing sharply dentate, tail  $R^3$  4 to 5 mm. long, tooth  $M^1$   $1\frac{1}{2}$  mm., tail  $M^2$  3 to 4 mm.

♀. Similar to ♂, wings wider ; disco-postdiscal band of upperside somewhat paler ; abdomen beneath much more extended, the white scaling reduced.

Length of forewing : ♂, 36—45 mm.

“ “ ♀, 41—51 mm.

Clasper narrower than in *Ch. jason*, hook very slender in a dorsal view, evenly curved ; penis thin, somewhat dilated at end, not suddenly bent before apex as in *jason*, without teeth ; penis-funnel obviously narrowed towards end, apex convex above, turned downward to a sharp hook.

*Hab.* Sierra Leone to Angola, Congo to the Naudi country, Uganda Protectorate, Nyassaland, Manicaland ; not found in the regions between the south shore of the Victoria Nyanza and the East Coast. A rather common insect.

#### a. *Ch. pollux geminus* Rothsch., subsp. nov.

*Charaxes pollux*, Trimen (*non* Cramer, 1775), *Proc. Zool. Soc. Lond.* p. 41. n. 64 (1894) (Manica) ; *Batl.*, *ibid.* p. 252. n. 8 (1895) (Zomba) ; *id.*, *l.c.* p. 720. n. 7. (1895) (Zomba) ; *id.*, *Journ. Linn. Soc. Lond.* XXV. p. 352. n. 8 (1896) (pt. ; Zomba) ; *Auriv.*, *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 233. n. 8 (1899) (Zomba).

♂ ♀. Hindwing *above* with admarginal spots, at least the upper ones present ; on the underside the hindwing bears in ♀ a triangular chocolate patch between bar D and apical cell-bar ; black abdominal line between  $SM^2$  and  $SM^3$  as a rule not hammer-shaped distally, postdisco-submarginal black anal ring of hindwing separated from anal edge of wing ; tails sharply pointed in both sexes.

*Hab.* British Central Africa and Manicaland. In the Tring Museum 6 ♂♂, 4 ♀♀ from Nyassaland : Lauderdale (*type*), Chipaika Estate, Baudawe (F. Watkinson), Zomba, December (Dr. P. Rendall).

#### b. *Ch. pollux pollux*.

*Papilio Eques Achivus pollux* Cramer, *Pap. Erot.* I. p. 61. t. 37. f. e. f (1775) (Guinea).  
*Papilio Eques Achivus castor* Fabricius (*non* Cramer, 1775), *Gen. Ins.* p. 251. n. 30. 31 (1776) ; Goeze, *Ent. Beytr.* III. p. 74. n. 16 (1779) ; Fabr., *Spec. Ins.* II. p. 11. n. 44 (1881) ; *id.*, *Mant. Ins.* II. p. 6. n. 48 (1787) ; Jabl. & Herbst, *Naturs. Schmetz.* IV. p. 57. n. 151. t. 63. f. 1. 2 (1790) ; Gmel., *Syst. Nat.* I. 5. p. 2235. n. 301 (1790) (pt.).

- Papilio camillus* Drury, *Illustr. Exot. Ins.* III. p. 41. t. 30. f. 1. 2 (1782) (S. Leone).  
*Papilio Nymphalis castor*, Fabricius, *Ent. Syst.* III. 1. p. 63. n. 196 (1793) (Guinea).  
*Eriboea polussa* (!), Hübner, *Verz. bek. Schmett.* p. 47. n. 427 (1816-27).  
*Papilio castor*, Donovan, *Nat. Reposit.* II. t. 116 (1826).  
*Papilio camillus*, id., *l.c.*  
*Nymphalis castor*, Godart, *Enc. Méth.* IX. p. 351. n. 4 (1823) (Guinea); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 308. n. 3 (1850) (S. Leone; Congo).  
*Charaxes castor*, Doubleday, *List Spec. Lep. Ins. Brit. Mus.* I. p. 110 (1844) (S. Leone; Congo); Butl., *Proc. Zool. Soc. Lond.* p. 623. n. 7 (1865) (S. Leone; Congo).  
*Charaxes pollux*, Butler, *Cat. Diurn. Lep. descr. by Fabr.* p. 53. n. 14 (1869) (S. Leone); Druce, *Proc. Zool. Soc. Lond.* p. 416 (1875) (Angola); Butl., *ibid.*, p. 60. n. 16 (1888) (Monbuttu, Equat. Afr.); Auriv., *Ent. Tidskr.* XII. p. 214. n. 134 (1891) (Cameroons); Schaus & Clements, *Sierra Leone Lepid.* p. 8 (1893); Auriv., *l.c.* XV. p. 310. n. 185 (1894) (Cameroons); Reb. & Rog., in Baumann, *Mossiland* p. 332. n. 37 (1894) (North Urundi); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 352. n. 8 (1896) (pt.; S. Leone; Angola; Monbuttu); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 233. n. 8 (1899) (pt.; Senegal; S. Leone; Ashanti; Cameroons; Gaboon; Cbinchoxo; Angola; Monbuttu).  
*Nymphalis pollux*, Kirby, *Cat. Diurn. Lep.* p. 267. n. 3 (1871) (*syn. ex parte*!).  
*Nymphalis castor*, id., *l.c.* n. 7 (1871) (*syn. ex parte*!).

♂. No admarginal spots on hindwing *above* except the olive buff anal one which is occasionally present; on *underside* the anal ring of the hindwing touches the edge of the wing, the black line between SM<sup>2</sup> and SM<sup>3</sup> is dilated at end, and in ♀ bar D of hindwing is so close to apical cell-bar that there is no or little chocolate scaling between them.

*Hab.* Sierra Leone to Angola and the Uganda Protectorate. In the Tring Museum 24 ♂♂, 14 ♀♀ from: Sierra Leone; Accra, Gold Coast; Gaboon R.; Bopota, Upp. Congo; Pt. Alice, Uganda, 19. vii. '94 (Dr. Ansorge); Nandi Station, Uganda Protectorate, 10. xii. '96 (Dr. Ansorge).

f<sup>7</sup>. Discal interstitial band of hindwing above bluish white.

#### 56. *Charaxes ansorgei* (Nov. Zool. V. t. 5. f. 2. ♂).

*Charaxes ansorgei* Rothschild, *Nov. Zool.* IV. p. 181. n. 5. (1897) (Patsbo, Nandi Country, Dec. 11, 1896); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 231. n. 2a. and p. 538 (1899).

♂. *Body, above*, pale chestnut, dots on head obsolete, line behind eye creamy buff; *below* brownish clay colour, with pale chestnut oblique streaks on breast, abdomen clayish chestnut; palpi buff, with a thin white lateral line, free portion of palpi with a broad black dorso-lateral stripe; legs clay colour, femora black above with the usual sprinkling of pale scales, anterior tibia and tarsus brown above, white beneath.

*Wings, above*.—Forewing: basal area tawny chestnut; cell-bar 4 transverse, about 2½ mm. long, bar D as in *phoebus*; median bars M<sup>2</sup>—SM<sup>2</sup> small, ill-defined, bars R<sup>3</sup>—M<sup>2</sup> represented by large patches, patch M<sup>1</sup>—M<sup>2</sup> halfmoon-shaped, diameters 3 and 4 mm., patch R<sup>3</sup>—M<sup>1</sup> broader, median bar R<sup>2</sup>—R<sup>3</sup> close to bar D, but separated from it, rounded, bars SC<sup>5</sup>—R<sup>2</sup> as large patches, fused together, disco-postdiscal band tawny orange, separated into patches by the black veins; discal bars SC<sup>2</sup>—R<sup>1</sup> heavy, confluent, joined at veins to postdisco-marginal area, bar R<sup>2</sup>—R<sup>3</sup> thinner, bar R<sup>2</sup>—R<sup>3</sup> more basal, dilated basad, bar R<sup>3</sup>—M<sup>1</sup> represented by a dot, bar M<sup>1</sup>—M<sup>2</sup> vestigial; marginal dots orange ochraceous, small.—Hindwing: purplish black, base more brown; a white discal band, slightly shaded with buff, about 4 mm. broad at SC<sup>2</sup>, dilated between SC<sup>2</sup> and M<sup>2</sup> owing to an extended bluish

white scaling; abdominal fold wood brown, edge greyish buff; a small and a larger pale blue submarginal spot between  $M^2$  and  $SM^2$ ; admarginal spots tawny ochraceous, upper ones the largest, subrotundate, the posterior ones linear, transverse, anal one olive buff.

*Underside*: basal area chestnut, outer area russet olive, basal to discal bars olive, the others black, position of bars nearly as in *pollux*, white borders of bars rather wider than in *pollux* in costal region of both wings.—Forewing: median bars  $R^3$ — $M^2$  concave distally, thinner than in *pollux*, olive bar  $R^2$ — $R^3$  separate from bar D, bars  $SC^4$ — $R^1$  feebly marked; discal interspaces  $M^1$ — $SM^2$  pinkish white, distally as sharply defined as in *phoebus*, discal bars  $SC^4$ — $M^2$  present, posterior ones mere dots, all placed close to postdiscal, russet olive, band (as in *pelias* and allies); postdiscal black patches less triangular than in *pollux*, white spots at outside of patches  $SC^4$ — $SC^5$  and  $R^2$ — $M^1$  rather conspicuous, blue spots  $M^2$ — $SM^2$  joined together; admarginal spots russet.—Hindwing: basal costal bar as in *pollux pollux*; median bars  $R^2$ — $M^2$  rather heavy, apical cell-bar separated from bar D by a chocolate triangle, abdominal lines inclusive white border much broader than olive chocolate interspaces; white discal band as sharply defined as in *phoebus*, narrower; postdiscal black bars as in *pollux*, but bars  $SC^2$ — $R^1$  and  $R^3$ — $M^1$  more proximal, hence the respective submarginal interspaces, which are like the others russet olive, wider than in *pollux*; admarginal interspaces slightly ochraceous; blue submarginal spots in anal ring; dentition of edge sharp, tails pointed, about 4 mm. long.

♀. Unknown.

Length of forewing: ♂, 38 mm.

*Hab.* Patsho, Nandi Country, 11. xii. '96 (Dr. Ansorge), 1 ♂.

The *type* of this species has so far remained unique.

♂<sup>4</sup>. Base of forewing above black; discal interstitial band of patches of forewing above white, or maize yellow, upper patches sometimes shaded with orange.

### 57. *Charaxes brutus*.

*Papilio Eques Achirus brutus* Cramer, *Pap. Exot.* III. p. 82. t. 241. f. E. F (1779) (Cap. b. sp. ! *loc. err.*).

*Papilio Eques Achirus cajus* Jablonsky & Herbst, *Naturs. Schmett.* IV. p. 65. n. 154. t. 64. f. 1. 2 (1790) (Cap. b. sp., *loc. err.*).

♂. *Body above* olive black, sometimes more bistre, third segment of palpi black, free upperside of second segment of palpi, head and pronotum dark ferruginous, mesonotum somewhat 'greenish olive or steel blue; four indistinct dots on head and a line behind eye white; *underside* pale orange, palpi with a black dorso-lateral and a white ventro-lateral stripe; breast with black oblique streaks underneath legs edged with grey; abdomen white at side; forelegs black above, white beneath, tarsus with some orange scales, the other legs whitish clay colour, femora above black with dispersed white scales.

♂. *Wings above* brownish black, with a purplish tint in certain lights, crossed by a white, creamy white, or maize yellow band; fringe white between veins.—On forewing the band is interrupted at the veins, consisting of eight spots which become smaller costad, the last spots varying in width before  $SM^2$  from 4 to 10 mm., outer edge of band parallel to outer margin of wing, distance about 8 mm.,

at spot  $SC^4$ — $SC^6$  often a little inclining costad ; median bars  $R^3$ — $M^2$  in some specimens vestigial, forming the proximal border of the respective patches of the band ; admarginal dots, if present, small, all of about the same size.—Hindwing : band considerably variable in width, widest in front, but often widely bordered with pale glaucons blue, in which case the band appears wider in and beyond cell than towards costal margin, stopping at ( $SM^1$ ) or nearly reaching abdominal margin, distance of band from outer edge of wing 10 to 11 mm. at  $SC^2$ , and 6 to 8 mm. at ( $SM^1$ ) ; abdominal margin ochraceous ; submarginal spots blue, mostly with white centres, generally only the last two or three present, spots  $C$ — $R^2$  seem to be always wanting ; admarginal spots absent, or vestigial, or the series more or less complete.

*Underside* from base to white band red chestnut or rufous red or reddish cinnamon rufous, from band to outer margin varying from tawny ochraceous to tawny olive, basal to median bars with heavy and clearly defined white borders all round, these bars black, heavy, their centres often more or less extended olivaceous wood brown ; veins partly thinly edged with white ; band not interrupted.—Forewing : a white line along costal edge from base to beyond middle ; black basal cell-spot absent, cell-bar 4 not or very little angled, at right angles to the veins like the other cell-bars, bar 3 heavier than 4, but often abbreviated and elongate-ovate ; submedian  $M^2$ —( $SM^1$ ) oblique, mostly joined to or fused with median bar  $M^2$ —( $SM^1$ ), submedian bar  $M^1$ — $M^2$  just before base of  $M^1$ , about 1 to 2 mm. distant from median bar, both often joined together at  $M^2$ , the interspace between them sometimes all white ; median bar  $R^3$ — $M^1$  about  $\frac{1}{2}$  or 1 mm. more distal than median bar  $M^1$ — $M^2$ , often slightly inclining basad, bar  $R^2$ — $R^3$  fused with bar D, bars  $SC^1$ — $R^1$  in the usual place, continuous, but often somewhat broken at veins ; discal bars  $SC^1$ — $R^1$  present, the others absent, but sometimes the rufous scaling which, if they were present, would separate them from the median bars, vestigial also between  $R^3$  and  $M^2$  ; the white or yellowish band is a disco-postdiscal band, the upper two partitions,  $SC^4$ — $R^1$ , are postdiscal, width of band as above, rather wider behind ; postdiscal bars represented by a series of black triangular or rounded patches which stand a little nearer the white band than the outer edge of the wing, the posterior patches largest, all bordered at least distally with bluish or buffish white scales which form generally a heavy  $M$  between  $M^2$  and  $SM^2$  ; veins with black, ill-defined spots at ends, and pale ones between.—Hindwing : costal edge thinly white ; basal costal bar separate from veins, but often touching costal line ; subbasal bar  $C$ — $SC^2$  absent, seldom vestigial ; submedian costal bar at right angles to costal margin or inclining distad, 1 to  $1\frac{1}{2}$  mm. from base of PC, bar  $C$ — $SC^2$  inclining distad, often touching cell-bar 2, more distal at C than costal submedian bar, reaching  $SC^2$  at or before base of  $R^1$  ; cell-bar 4 in front of base of  $M^2$ , anteriorly prolonged along  $D^2$  and  $D^1$ , mostly joined along  $R^2$  to bar  $D^3$  ; median costal bar generally inclining basad, the series of median bars widely interrupted at veins, but almost straight down to ( $SM^1$ ), bar  $R^2$ — $R^3$  fused with bar  $D^3$  ; longitudinal lines upon abdominal fold heavy, line  $SM^2$ — $SM^3$  continuous distally with line  $SM^2$  ; white discal band more or less narrowing abdominad, reaching abdominal margin, generally with some rufous scales anteriorly (and often also between  $R^2$  and  $R^3$ ) at the outer side of the median bars, these scales then separating the white border of the bars from the band, width of band variable ; discal bars  $C$ — $R^1$  absent, the following ones also often absent, but those beyond  $M^2$  generally marked, bordered white distally, placed at the outer edge of the



white band ; postdiscal bars represented by black spots, which are halfmoon-shaped, but have often the middle of the concave outer side somewhat produced, hence resembling slightly an anchor, bordered pale olive or white or bluish white distally, this white scaling produced into a pointed line upon internervular folds  $SC^2-R^1$  and  $R^3-M^1$ , the series of postdiscal spots about midway between white band and submarginal bars, curving distad between  $R^1$ —and  $R^3$  ; submarginal black bars transverse, the series parallel to outer margin, interrupted at veins, bordered white proximally, very thinly so distally ; bars  $M^2-SM^2$  curved, forming with the respective postdiscal bars a ring ; submarginal interspaces varying from chestnut red to pale olive ; admarginal interspaces ochraceous, bordered milky white distally ; marginal line black, about  $\frac{1}{3}$  mm. broad, continuous ; edge of wing sharply dentate ; tails triangular, mostly sharply pointed ; tooth  $M^1$  often developed to a third, shorter, tail.

♀. Like ♂, but larger, wings, especially hindwing, broader, band wider, in Madagascar form band of forewing anteriorly orange, with spots  $R^1-R^3$  produced basad, discal interspaces  $SC^1-R^1$  also with orange patches ; abdomen beneath with a black, broad streak along each side, which is slightly interrupted at edges of segments.

Length of forewing : ♂, 34—45 mm.

” ” ♀, 44—50 mm.

Hook of clasper evenly and gently curved (in a dorsal view), slender ; penis somewhat widened at end, with one single, dorsal, tooth standing about 1 mm. before the apex ; penis-funnel moderately narrowed towards end, slender, apical edge produced downwards to a very short tooth.

*Hab.* Africa, south of the Sahara, Madagascar, a common species. We distinguish five subspecies.

#### a. *Ch. brutus junius*.

*Charaxes brutus* var. *junius* Oberthür, *Ann. Mus. Civ. Genova* XV, p. 166. n. 47 (1879) (Abyssinia ; June, July, Aug., Sept.) ; Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 231. sub n. 1 (1899) (Abyss.).

*Charaxes junius* Oberthür, *l.c.* XVIII, p. 728. n. 58 (1883) (Feleklek ; Sciotalit ; Let-Marefia ; I. II. VII. VIII. IX. X. XI. XII.).

♂. Head and pronotum shaded with olive, less bright ferruginous than in the other races ; body *below* tawny olive, sides of abdomen without white line.

*Wings above* blackish brown, band maize yellow, no blue scaling at edge of band.—Forewing : band 6 to 7 mm. broad at  $SM^2$ , then gradually narrowing to  $R^3$ , upper four spots smaller ; marginal spots maize yellow, but their proximal edges slightly shaded with buff.—Hindwing : band gradually narrowing down to ( $SM^1$ ), 6 to 7 mm. broad at  $SC^2$ , 2 mm. at ( $SM^1$ ), reaching abdominal margin, where it is somewhat dilated again, outer edge of band a little concave between veins ; admarginal spots subluniformal, separated at veins, orange buff, all present, upper one a dot ; submarginal blue dots  $M^2-SM^2$  merged together.

*Underside* reddish cinnamon rufous from base to discal band ; bars with wide grey centres, their black colour reduced to thin lines.—Forewing : band cream colour ; outer area of wing clayish ; postdiscal spots triangular, but rather small, the upper ones olivaceous ; black scaling at end of veins reduced.—Hindwing : band creamy white ; postdiscal interspace (outside white band) hazel, ochreous behind ; postdiscal bars as in the other continental forms, but smaller ; submarginal interspaces clayish hazel ; submarginal black bars partly obliterated, replaced by

white scaling, bars  $M^1$ — $SM^2$ , however, present, closer to the postdiscal ones than in the other subspecies; admarginal interspaces (anal one included) ochreous; edge of wing bluntly dentate, a very short and blunt tooth at  $M^1$ ; tails shorter, broader, and less pointed than in the other four races, upper tail 5 mm. long, second 4 mm., no tail at  $M^1$ .

♀. Like ♂, but band broader, paler, blue submarginal dots of hindwing and marginal spots of forewing smaller; abdomen blackish brown above and below; underside slightly tawny in middle.

Length of forewing : ♂, 44 mm.

” ” ♀, 49 mm.

*Hab.* Abyssinia, recorded by Oberthür from Shoa as being found all the year round except in March and April; in the Tring Museum are specimens (received from the Genoa Museum), labelled Sciotalit, January, and Feleklek, February, 1880 (Antinori).

Dr. Butler, in his Revision of the genus *Charaxes* does not mention this peculiar form.

**b. *Ch. brutus somalicus* Rothsch., subsp. nov.**

♂. Similar to *Ch. brutus junius*, discal band of *upperside* nearly as yellow; differs *above* in the band of the forewing being narrower behind, being about as wide in *somalicus* at  $SM^2$  as it is at  $M^2$  in *junius*; further, in the band of the hindwing being anteriorly also narrower than in *junius*, having the greatest width at  $R^2$ , and in the slightly thinner admarginal lunules. On the *underside* the basal area is coloured as in *brutus brutus*, the bars are, however, as grey as in *junius*, but a little broader; the postdiscal black spots of both wings are larger than in *junius*; the submarginal bars as heavy as in *brutus brutus*; submarginal interspaces more olive than in *brutus brutus*, much wider than in *brutus junius*, white discal band narrower than in the latter form; body as in *junius*.

*Hab.* Harrar Highlands, Somaliland, 1 ♂ in the British Museum.

**c. *Ch. brutus angustus*.**

*Charaxes brutus*, Druce (non Cramer, 1779), *Proc. Zool. Soc. Lond.* p. 412 (1875) (Angola); Plötz, *Stett. Ent. Zeit.* XLI. p. 194. n. 102 (1880) (Cameroons, VII. IX. x.); Dewitz, *Nor. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 371 (1887) (Mukenge); Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 125. n. 65 (1889) (Kassai); Smith, *Proc. Zool. Soc. Lond.* p. 472. n. 84 (1890) (Aruwimi); Godm. & Salv., in Jameson, *Story Rear Column* p. 440. n. 79 (1890) (Aruwimi); Sharpe, *Iris* IV. p. 58. u. 57 (1891) (Banggala); Auriv., *Ent. Tidskr.* XII. p. 215. n. 136 (1891) (Cameroons); id., *l.c.* XV. p. 310. n. 186 (1894) (Cameroons, II. XI.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 350. n. 1 (1896) (pt.; Cameroons; Angola); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 231. u. 1 (1899) (pt.; Congo; Banggala, Kassai, Aruwimi; Mukenge; Angola; Cameroons).

♂ ♀. Similar to *natalensis*, but differs as follows:—

*Wings above* with a narrow band, that of forewing measuring only  $2\frac{1}{2}$  to 4 mm. before  $SM^2$ , band of hindwing gradually decreasing in width behind; very little or no olive blue scaling along band on either wing; marginal spots of forewing vestigial or absent, the posterior ones generally absent, but sometimes all as well marked as in *natalensis*; no admarginal spots on hindwing.

*Underside*: bars on the whole heavier than in *natalensis*, basal area red chestnut; of the discal series of bars of the hindwing bars  $C$ — $M^1$  or  $C$ — $M^2$  absent, interspaces between white band and black postdiscal bars tawny ochraceous, while the submarginal interspaces are reddish chestnut.

*Wings above* purplish black, band white, sometimes cream colour, obviously edged with pale blue from M<sup>2</sup> of forewing to (SM<sup>1</sup>) of hindwing.—Forewing: band broad behind, considerably narrowing costad, 8 to 10 mm. wide at SM<sup>2</sup>, 5 to 6 mm. at M<sup>2</sup>, and 3 or 4 mm. between M<sup>1</sup> and M<sup>2</sup>, two upper spots often minute, especially in Natal individuals; marginal spots distinct, white, proximally somewhat

buffish.—Hindwing: bluish border of band wide, especially proximally in and behind cell; admarginal spots cream colour, bluish at and buffish between veins, in most individuals widely interrupted between veins, but sometimes the halfmoons complete; blue submarginal dots varying in number from 2 to 5.

*Underside*: reddish chestnut up to median bars or almost ferruginous; discal bars  $R^1$ — $SM^2$  of hindwing more or less heavily marked, often also bar  $SC^2$ — $R^1$  present; postdiscal interspaces (between white band and postdiscal bars) of the same or nearly the same tint as the submarginal interspaces; wing strongly dentate, tails long and pointed.

♀. Like ♂, abdomen beneath pale orange with two black, slightly interrupted lines.

*Wings, above*: more brown, less deep black than in ♂, band wider than in ♂. —Forewing: band 10 to 12 mm. broad at  $SM^2$ , the upper spots often orange distally, spots  $R^1$ — $R^2$  elongate in most specimens, shorter in those from Natal than in individuals from tropical East Africa, sometimes there is a very faint vestige of the discal spots  $SC^4$ — $R^1$  present in *Ch. brutus andara* ♀; marginal spots dull orange, whitish in middle at edge of wing.—Hindwing: admarginal spots seldom vestigial only, occasionally not interrupted between veins, smaller in Natal specimens than individuals from tropical E. Africa.

*Underside* exhibits the same distinguishing characters as ♂, tooth at  $M^1$  comparatively shorter than in ♂.

Length of forewing: ♂, 37—45 mm.

” ” ♀, 42—50 mm.

Penis as in *andara* with a minute tooth shortly behind the subapical tooth.

*Hab.* East Africa, from Natal to the Tanganyika, Kilimandjaro and the coast regions of German East Africa, not found in the Cape Colony, and not yet recorded from the coast districts of British East Africa. In the Tring Museum 11 ♂♂, 14 ♀♀ from: Natal: Rikatla, Delagoa Bay; Mozambique; Dar-es-Salaam; Taveta (July); Zomba and Lauderdale, Nyassaland; Parumbira, October 22nd and November 7th (Dr. Ansorge).

The larva was discovered by Mr. Gooch. Dr. Trimen, *l.c.*, describes the caterpillar and chrysalis as follows:—

“LARVA.—Bright yellowish green (covered with minute yellow granules); second and last segments of a much duller green than the others. On each side of back a row of cuneiform yellowish marks, broad anteriorly, and deflected upward and posteriorly, narrowing to a point before hind-edge of the segment. On seventh segment a yellow-circular dorsal marking with a brown centre. Head light green; the frontal horns short and tipped with cobalt-blue,—the two outer horns shorter than the two middle ones; mandibles light blue tipped with black. (W. D. Gooch, MS. description and outline drawing of Natalian larva, 1874).

“Captain H. C. Harford, who also observed the larva in Natal, saw the ova deposited on the leaves of the Seringa (*Melia azedarach*), and noted that they were at first pale yellow, but became in a few hours reddish brown. From an egg that was watched on a leaf out of doors the larva was hatched on the eighth day after its deposit. It was brownish green, with the head and horns brown, and the caudal processes very long and curved inward. After the first moult, it was dark olive green, with a slight indication of a pale spot on the back of the seventh segment; the head being of a darker brown, but the horns lighter at the tip; while the anal processes were light ashy grey. After the second moult, it became dark green



minutely irrorated with white, and showed the whitish spot on the second segment much more distinctly; the head was larger in proportion to the body, and presented an ochreous line running along the sides and along outer edge of the horns. After the third moult, it remained of the same dark green, but the white dorsal spot was circled with light blue. (This larva does not appear to have been described by Captain Harford in its final stage).

“PUPA.—Bright green; spiracles reddish brown ringed with white, diminishing in size towards last segment; projections of head tipped with white; some confluent white spots on wing covers. Head rather acutely bifid; thorax very convex; wings forming slight lateral projections; abdomen making a great angle at the segment in a line with apex of wing-covers, the last segment prolonged into a pedicel bearing four tubercles. (H. C. Harford, MS. notes on Natalian pupa, 1869).”

About the habits of *Ch. brutus natalensis* we learn from Dr. Trimen that he “frequently met with this fine *Charaxes* at Port Natal, and managed to capture a good many specimens at the ‘sucking places’ (on stems or branches of trees where moisture exuded) so specially attractive to butterflies of this group. On the wing, *brutus* is one of the very swiftest of *Nymphalidae*, and it is difficult to follow its flight, except when it is chasing another of its species, or some competitor at the drinking stations mentioned. I noted examples in February, March, and April, and Colonel Bowker took several in August in the same locality; while in Kaffraria he had noticed the butterfly’s occurrence in March, May, and June.”

The individuals from the Tanganyika region connect *natalensis* with the West African forms.

#### f. *Ch. brutus andara*.

*Charaxes andara* Ward, *Ent. Mo. Mag.* IX. p. 209 (1873) (Madagascar); Saalm., *Lep. Mus.* p. 88. n. 128 (1884); Mab., in Grandid., *Hist. Madag. Léop.* I. p. 187. t. 22. f. 4. 5. 6 (1887) (Tamatave; Foulepointe); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 351. n. 2 (1896) (Antananarivo; Ft. Dauphin); Auriv., *Kongl. Sr. Vet. Ak. Handl.* XXXI. 5. p. 231. n. 2 (1899) (Madag.)

♂. Edges of abdominal segments above sometimes slightly grey. *Wings above* with a violet tint; band conspicuously edged with pale blue from  $M^2$  of forewing to ( $SM^1$ ) of hindwing.—Forewing; band 6 to 8 mm. broad before  $SM^2$  (inclusive of blue border), patch  $M^1$ — $M^2$  3 to 4 mm. wide, spot  $R^2$ — $R^3$  generally elongate, narrow, sometimes prolonged to bar D, but its proximal portion then shaded with brown, spot  $R^1$ — $R^2$  often also elongate, spots  $SC^1$ — $R^1$  mostly bluish, small, often only vestigial; marginal spots white as a rule, often slightly orange proximally, in one specimen (in Mr. Grose-Smith’s collection) all orange and rather larger than usually.—Hindwing: two submarginal dots  $M^2$ — $SM^2$ , blue; admarginal bluish creamy white line seldom continuous, mostly very widely interrupted between veins, there remaining only triangular spots at the ends of the veins, these spots extending into tails, anal admarginal spot, however, linear and transverse, bluish olive; discal band stopping at ( $SM^1$ ).

*Underside* rufous red from base to discal band, bars without grey centres.—Forewing: cell-bar 3 somewhat rounded, 4 rather slender, as is bar D; median bars  $SC^3$ — $R^2$  also slender, bars  $SC^5$ — $R^2$  each very much longer than broad (a part of white border) discal bars  $SC^1$ — $R^1$  dark olive; outer area of wing from white band to margin tawny ochraceous; black postdiscal patches  $R^1$ — $M^1$  rather smaller than in the continental forms, less pointed.—Hindwing: basal costal bar not touching white costal edge, often rounded, almost circular, white band posteriorly as well as anteriorly with brown spots or vestiges of such; interspace between white discal

band and black postdiscal bars cinnamon rufous, as a rule darker than basal area ; postdiscal bars C—M<sup>2</sup> transverse, not or slightly curved, rather thin, not dilated in middle, edged olive distally ; submarginal interspace chestnut, seldom rufous chestnut, much wider than in the other forms, bar R<sup>1</sup>—R<sup>2</sup> 5 mm. distant from submarginal bar, much shaded with white distally, interspaces M<sup>1</sup>—SM<sup>2</sup> olive, with blue and white submarginal dots ; submarginal bars blackish olive, transverse, linear ; wing more heavily dentate than in the continental forms, tail R<sup>3</sup> 7 to 8 mm. long, tail M<sup>1</sup> 3 to 5 mm., tail M<sup>2</sup> 6½ to 7½ mm.

♀. *Wings above* less bluish than in ♂.—Forewing : costal margin more or less tawny ; band pale orange, white from M<sup>2</sup> backwards, posteriorly edged with pale blue at both sides, but especially proximally, 10 mm. broad at SM<sup>2</sup>, patch R<sup>3</sup>—M<sup>1</sup> 7 mm. long, oblique proximally, patch R<sup>2</sup>—R<sup>3</sup> extended to bar D, patch R<sup>1</sup>—R<sup>2</sup> about twice as long as broad, with two discal spots in front, besides the two rounded postdiscal spots SC<sup>4</sup>—R<sup>1</sup>, discal spot SC<sup>5</sup>—R<sup>1</sup> rather larger, produced distad along R<sup>1</sup> and mostly joined to the postdiscal spot, discal spot SC<sup>4</sup>—SC<sup>5</sup> linear, an orange streak also in front of SC<sup>4</sup> ; marginal spots pale orange.—Hindwing : band broadly bordered with bluish white proximally, basal half of abdominal fold also milky white, pale blue distal border of band gradually narrowing costad ; blue submarginal dots M<sup>2</sup>—SM<sup>2</sup> heavy, fused together as a rule, dot M<sup>1</sup>—M<sup>2</sup> often present ; admarginal line orange between, creamy buff or bluish at veins, nearly continuous, or interrupted at the veins, often obsolete from C to R<sup>1</sup>, anal portion as in ♂, but wider.

*Underside* : as in ♂, but submarginal area of hindwing more olive and white, the chestnut scaling very much reduced, sometimes almost entirely replaced by olive and white ; tails and teeth as in ♂, rather broader at base and longer.

Length of forewing : ♂, 34—41 mm.

” ” ♀, 42—46 mm.

Penis sometimes with a second, very small, tooth situated behind the ordinary tooth present in all forms of *brutus*, agreeing with that of *natalensis*.

*Hab.* Madagascar, apparently all over the island in suitable localities ; a forest insect. In the Tring Museum 8 ♂♂, 2 ♀♀, partly from Morondawa.

The *female* is very different from those of the continental *brutus* on account of the development of the discal interstitial patches of the forewing above ; this conspicuous difference, however, does not justify specific separation, because traces of the discal parts of those patches are found also in continental *females*.

♂<sup>3</sup>. Black postdiscal bars of hindwing below absent, or represented by elongate triangular, longitudinal spots, their grey distal borders present, upper ones long, curved proximally towards the veins, the lines in the same cellule forming distally an acute angle, but do not always reach one another.

k<sup>4</sup>. Bars in basal half of underside all black, not centred grey.

### 58. *Charaxes castor*.

*Papilio Eques Achirus castor* Cramer, *Pap. Exot.* I. p. 61. t. 37. f. c. d. (1775) (Guinea).

*Papilio Eques Achirus pollux*, Fabricius (non Cramer, 1775), *Gen. Ins.* p. 251 (1776).

♂♀. *Body above* olive, with a faint russet tint anteriorly, white dots on head more or less obvious, line behind eye conspicuous ; *underside* olive black, faintly russet ; palpi with a very broad white stripe, breast obliquely striped buffish white,

segments of abdomen edged white, this colour laterally fused to a streak, forelegs black above, white beneath, other legs black, densely scaled buffish white, except upperside of femora.

♂. *Wings above* purplish black, base of hindwing more sepia colour, base of forewing occasionally faintly chocolate.—Forewing : elongate, median bars often vestigial in side-light, cell occasionally with one or two ochraceous buff dots at the distal and proximal edge respectively of the large cell-bar 4, corresponding to the anterior portions of the apical and subapical interspaces of the cell below ; a band of discal interstitial spots from  $SC^5$  to internal margin, pale ochraceous or buff, the band widely interrupted at  $R^2$ , the two upper spots being more distal than the other patches which stand in a straight row, last three patches up to  $M^2$  continuous (vein  $SM^2$ , however, thinly black), 4 to 7 mm. broad before  $SM^2$ , patch  $M^1-M^2$  narrower, somewhat halfmoon-shaped, more distal, patch  $R^3-M^1$  again narrower, halfmoon-shaped, again more distal, spot  $R^2-R^3$  much smaller, elongate, just in front of patch  $R^3-M^1$ , 4 to 6 mm. from cell, spots  $SC^5-R^2$  smaller, nearly square, the upper of the two somewhat oblique, the second slightly concave proximally and often also concave distally ; this band of patches is followed by a postdiscal series of six interstitial spots of the same colour, the series slightly curved, uppermost spot the largest, subrotundate, or proximally concave, 6 or 7 mm. from outer margin, about 3 mm. wide, the others gradually approaching discal patches, spot  $R^3-M^1$  often, spot  $M^1-M^2$  always touching discal patches at veins  $M^1$  and  $M^2$  respectively, halfmoon-shaped, sometimes these last two spots fused with the discal patches at both ends, thus entirely isolating the respective black postdiscal spots ; fringe thinly, white between veins ; marginal internervular spots, if present, minute, creamy white.—Hindwing : median bars  $C-R^1$  seldom separated from the black basal area by some creamy buff scaling ; a triangular ochraceous buff or pale buff band, nearly white at costal margin, seldom reaching  $M^2$ , often much shortened, 5 to 8 mm. broad at  $SC^2$ , externally sinuate at  $SC^2$  and  $R^1$  in many specimens, the outer edge of band at  $R^3$  very little distal of, or just at base of  $M^1$  ; apex of cell often shaded with creamy buff ; four or five blue submarginal dots, the last two fused, with white centres ; a series of admarginal interstitial spots, upper one or two ochraceous, the following more or less pale blue, often creamy at veins, last one or two greenish olive buff, spot  $C-SC^2$  generally triangular, the others transverse, mostly produced distad at veins, narrowed or interrupted at internervular folds, spot  $SC^2-M^2$  thinner between veins than the black marginal line ; fringe conspicuously white between veins.—*Underside* : basal area chestnut or black, with intergradations, black bars very heavy, nearly the same in position as in *Ch. pelias*, *jason*, *epijanius* and *hansali*, white borders of bars heavy.—Forewing : cell-bar 3 ovate ; bar D widened in front ; submedian and median bars  $M^1-SC^2$  close together, mostly fused or joined together, median bar  $R^2-R^3$  separated from bar D by the white border line, median bars  $SC^4-R^2$  fused to a broad band which is narrowest costally ; black discal spots  $SC^5-M^2$  placed as in the allied species, upper two much larger than the others, discal interspaces creamy white, interspace  $SC^5-R^1$  generally with an ochraceous spot ; postdiscal interstitial band yellow ochraceous or buff, posterior patches transverse, often luniform, upper ones more rounded, touching the black discal spots or being separated from them by white scaling ; black postdiscal patches heavy, rounded distally, patches  $M^2-SM^2$  not separated or incised at ( $SM^1$ ), but faintly emarginate distally, as is patch  $M^1-M^2$  in many specimens, the patches bordered distally, seldom also proximally (the last ones always

excepted), with olive grey, this scaling forming generally a kind of bracket ], being externally limited by a series of thin, black, submarginal bars, which mostly curve basad at ends; veins olive grey near ends, but black at edge of wing, white internervular marginal dots minute, or as large as the black transverse spots at ends of veins.—Hindwing: median bars somewhat more proximal than in the allied species, except *Ch. hansali*, basal costal bar less S-shaped than in *hansali*; white discal interstitial band widest in front, variable in width; of the discal series of bars only bars  $M^1$ — $SM^3$  and  $R^2$ — $R^3$  present; postdiscal interstitial band chestnut, very broad, seldom less broad than the submarginal interspaces, mostly slightly separated into patches by the thinly grey veins, the band proximally sinuated between  $R^2$  and  $R^3$ , patches  $R^3$ — $M^2$  generally rounded proximally, the band continued to abdominal margin by a pale ochreous uniform patch of nearly even width; black postdiscal bars inconspicuous, bordered externally by grey lines which form, as in the allied species, acute angles upon and between the veins, lines touching  $SC^2$  and  $R^1$  long; submarginal black bars transverse, bars  $M^1$ — $SM^2$  or  $R^3$ — $SM^2$  larger, submarginal interspaces olive, interspace  $M^2$ — $SM^2$  large, upper ones more or less heavily shaded with bluish grey, blue and white submarginal dots obvious, except upper ones; admarginal interspaces pale ochreous, slightly edged with pale blue, especially at veins; black marginal line often heavier than the admarginal interspaces, broadest between veins as a rule; edge of wing obviously dentate, two tails, upper one acute, 4 to 7 mm. long, second of nearly even width, 6 to 9 mm. long.

♀. Larger than ♂, paler, the discal interstitial band of the wing above on the whole wider, tails longer, the second or both slightly spatulate and curving a little frontad.

Length of forewing: ♂, 44—53 mm.

“ “ ♀, 51—61 mm.

Sexual armature similar to that of *Ch. jason*; penis with a few minute teeth immediately behind the heavy subapical tooth.

*Hab.* A common species in tropical Africa, not found in Cape Colony and Natal, replaced in Abyssinia by *Ch. hansali*.

#### a. *Ch. castor flavifasciatus*.

*Charaxes hansali* var., Standinger, *Exot. Tugf.* p. 168 (1886) (Zanzibar, mainland).

*Charaxes castor*, Trimen & Bowk., *S. Afr. Butt.* I. p. 338. n. 112 (1887); *id.*, *l.c.* III. p. 407 (1889) (Barberton); Pagenst., *Jahrb. Wissensch. Anst. Hamburg.* X. 2. p. 26. n. 53 (1893) (E. Ungu, IX.); Trimen, *Proc. Zool. Soc. Lond.* p. 41. n. 53 (1894) (Manica); Holland, *Proc. U. States Nat. Mus.* XVIII. p. 262 (1895) (Somaliland); Sharpe, *Proc. Zool. Soc. Lond.* p. 533. n. 33. (1896) (Darro Mts., Somaliland, XI.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 353. n. 10 (1896) (pt.; Tanganyika; Mamboia).

*Charaxes hansali*, Butler (non Felder, 1867), *Ann. Mag. N. H.* (6). VII. p. 42. n. 9 (1891) (Kandere and Nguru, Germ. E. Afr., Oct. Nov.).

*Charaxes castor* Crann. var. *flavifasciatus* Butler, *Proc. Zool. Soc. Lond.* p. 251. n. 5 (1895) (Zomba); *id.*, *l.c.* p. 852. n. 9 (1896) (Nyassaland); *id.*, *Journ. Linn. Soc. Lond.* XXV. p. 353. n. 10 (1896) (pt.; Del. Bay; Zomba; Zambesi; Centr. Afr.; “Upp. Egypt” loc. err.? an *hansali*?); Anriv., *Kongl. Sc. l’et. Ak. Handl.* XXXI. 5. p. 232. sub n. 4 (1899) (Del. Bay; Zambesi; Manica; Nyassa; Parumbira; Brit. E. Afr.).

*Charaxes flavifasciatus* Butler, *Ann. Mag. N. H.* (6). XVIII. p. 68. n. 2 (1896) (Nyassaland).

*Charaxes castor* var. *orientalis* Stand. (*sic!*), Lanz, *Iris* IX. p. 140 (1896) (Parumbira, Oct.).

♂ ♀. *Wings above*: discal band pale buff yellow, seldom of the same ochraceous tint as in the western form.—Forewing: marginal internervular buffish white



spots present, seldom only vestigial; basal area in most individuals rather paler, cell-bar 4 often vestigial, not rarely bordered by two pale buff spots; some individuals, especially ♀♀, have a vestige of a pale buff spot before the base of R<sup>1</sup>.—Hindwing: submarginal interstitial lunules mostly not interrupted at internervular folds in ♂.

*Underside*: interspaces in basal area chestnut, very seldom black, bars rather thinner than in the west coast form.—Forewing: postdiscal pale ochraceous spots not touching black discal spots; marginal white spots conspicuous.—Hindwing: chestnut band on the whole less broad than in *castor castor*, more deeply sinuate distally at C, SC<sup>2</sup>, and R<sup>1</sup>, the sinus sometimes extending to near proximal edge of this band; submarginal bars and marginal line rather thinner than in *castor castor*, hence pale yellow admarginal interspaces larger.

**a<sup>1</sup>. Ch. castor flavifasciatus f. flavifasciatus.**

Interspaces of basal half of *underside* chestnut.

This is the ordinary East African form.

**b<sup>1</sup>. Ch. castor flavifasciatus f. reimeri** Rothsch., nov.

Interspaces of basal half of *underside* black. *Type* from Dar-es-Salaam.

This form is very rare.

In a gynandromorphous individual in the Tring Museum from Mikindani, German E. Africa, collected by Herr Reimer, the interspaces of the basal area of the underside are chestnut on the ♂-wings, black on the ♀-wings.

*Hab.* East Africa, from Nyassaland and Delagoa Bay to Somaliland. In the Tring Museum 18 ♂♂, 8 ♀♀ from: Delagoa Bay; Likoma, Nyassa, vi. vii.; Zomba, December 1895 (Dr. P. Rendall); Parumbira, October (Dr. Ansorge); Mikindani; Lindi; Taveta, vi. vii. '90; Dar-es-Salaam.

**b. Ch. castor castor.**

*Papilio Eques Achirus castor* Cramer, *l.c.*

*Papilio Eques Achirus pollux*, Fabricius (non Cramer, 1775), *Gen. Ins.* p. 251 (1776); Goeze, *Ent. Beytr.* III. 1. p. 75. n. 17 (1779); Fabr., *Spec. Ins.* II. p. 11. n. 45 (1781); id., *Mant. Ins.* II. p. 6. n. 49 (1787); Herbst, *Naturs. Schmett.* IV. p. 60. n. 152. t. 63. f. 3. 4 (1790); Gmelin, *Syst. Nat.* I. 5. p. 2235. n. 302 (1790).

*Papilio Nymphalis pollux*, Fabricius, *Ent. Syst.* III. 1. p. 63. n. 197 (1793).

*Eriboea castoris* (!), Hübner, *Verz. bek. Schmett.* p. 47. n. 426 (1816-27).

*Nymphalis pollux*, Godart, *Enc. Méth.* IX. p. 352. n. 5 (1823) (Guinea); Lucas, *Lep. Ex.* p. 119. t. 62. f. 1 (1835) (Guinea); Donbl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 308. n. 4 (1850); Kirby, *Cat. Diurn. Lep.* p. 267. n. 3. (1871) (pt.).

*Charaxes pollux*, Doubleday, *List Spec. Lep. Ins. Brit. Mus.* I. p. 110 (1844) (Asbanti); Feistb., *Ann. Soc. Ent. Fr.* p. 255. n. 8. t. 9. f. 1. ♀ (1850) (Senegal); Butl., *Proc. Zool. Soc. Lond.* p. 623. n. 3. (1865) (Ashanti; Guinea).

*Charaxes castor*, Butler, *Cat. Diurn. Lep. descr. Fabr.* p. 53. n. 15 (1869) (S. Leone); Druce, *Proc. Zool. Soc. Lond.* p. 412 (1875) (Angola); Staud., *Exot. Tagf.* p. 168 (1886) (Senegal, Cameroons, Fernando Po); Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 146. n. 75 (1889) (Gaboon); Mab., *Ann. Soc. Ent. Pr.* (6). X. p. 23 (1890) (Assinie); Mösch., *Abh. Senk. Ges.* XV. p. 61 (1890) (Aburi); Smith, *Proc. Zool. Soc. Lond.* p. 472. n. 83 (1890) (Aruwimi); Godm. & Salv., in Jameson, *Story of Rear Column* p. 439. n. 78 (1890) (Aruwimi); Auriv., *Ent. Tidskr.* XII. p. 214. n. 135 (1891) (Cameroons); Karsch, *Ent. Nachr.* XVIII. p. 176. n. 51 (1892) (Togo); id., *Berl. Ent. Zeitschr.* XXXVIII. p. 187. n. 51 (1893) (Adeli); Anriv., *l.c.* XV. p. 309. n. 184 (1894) (Cameroons, IV. XI.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 353. n. 10 (1896) (pt.; S. Leone; Ashanti; O. Calabar; Cameroons; Angola; Fernando Po); Auriv., *Kongl. Sc.*

*Vet. Ak. Handl.* XXXI. 5. p. 232. n. 4 (1899) (Senegal ; S. Leone ; Ivory Coast ; Ashanti ; Togo ; Cameroons ; Congo).

*Nymphalis castor*, Kirby, *l.c.* p. 267. n. 7. (1871) (pt.) ; Dewitz, *Nor. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 8. 28 (1879) (N. Angola).

*Charaxes castor* var. *flavifasciatus*, Butler, *l.c.* (pt. : Accra).

♂ ♀. *Wings above* : band pale ochraceous.—Forewing : marginal spots absent or vestigial, the white scaling generally restricted to the fringe.—Hindwing : posterior admarginal, pale blue, spots interrupted as a rule.

*Underside* : interspaces in basal area varying from black to chestnut.—Forewing : orange ochraceous postdiscal patches deeper in tint than in *flavifasciatus*, in most specimens touching the black discal spots ; black, submarginal, bracket-shaped bars heavier than in the eastern form ; white marginal dots minute.—Hindwing : postdiscal chestnut band less deeply triangularly sinuate externally at veins than in *flavifasciatus*, the sinus less pointed ; black admarginal line as wide as, or wider than, admarginal interspaces.

#### *c*<sup>1</sup>. *Ch. castor castor f. castor.*

Interspaces in basal area of *underside* chestnut or deep cinnamon rufous.—This form is comparatively rare. A *female* from Warri with short, non-spatulate tails, has the rufous chestnut band of the *underside* of the hindwing very narrow, the patches composing the band are, in fact, smaller than the respective submarginal interspaces, patch R<sup>1</sup>—R<sup>2</sup> (for instance) measuring 3 to 4 mm. in width.

#### *d*<sup>1</sup>. *Ch. castor castor f. godarti.*

*Charaxes castor* var. et ab. *godarti* Aurivillius, *l.c.*

Interspaces in basal area of *underside* black.—This is the usual West African form.

*Hab.* Senegambia to Angola, Upper Congo, Unyoro, Uganda as far east as the Nandi country. In the Tring Museum 20 ♂♂, 10 ♀♀ from : Sierra Leone ; Gold Coast ; Warri, Niger, January and July (Dr. Roth) ; Cameroons ; Congo : Stanley Pool to Lnkolele, Bopoto, Kassai ; Fajao, Unyoro, 22. vii. '97 (Dr. Ansonge) ; Patsbo, Nandi country, Uganda Protectorate, 11. xii. '96, and Ran, Nandi country, 14. iii. '98 (Dr. Ansonge).

Why Prof. Aurivillius calls the form *godarti* "var. et ab." we do not understand ; the name of the West African "var.," = subspecies = geographical race, is *Ch. castor castor* ; *godarti* is one of the two forms of this dichromatic subspecies.

*l*<sup>1</sup>. Bars in basal half of *underside* with greyish olive centres.

*i*<sup>2</sup>. Upperside with a broad maize yellow or orange band across both wings.

*i*<sup>3</sup>. Discal interstitial band of upperside maize yellow.

#### 59. *Charaxes hansali.*

*Charaxes hansali* Felder, *Reise Novara, Lep.* p. 446. n. 728. t. 59. f. 3. 4 (1867) (Bogos) ; Oberth., *Ann. Mus. Civ. Genova* XV. p. 166. n. 46 and p. 184. n. 25 (1879) (Sboa, July, Aug.) ; id., *l.c.* XVIII. p. 727. n. 57. (1883) (Ambo-Karra, VIII.) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 353. n. 9 (1896) (Bogos, Abyssinia) ; Sharpe, *Proc. Zool. Soc. Lond.* p. 370. n. 12 (1898) (Somaliland, Wagga, 6000 ft., Feb.) ; Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 233. n. 6 (1899) (Bogos) ; Somaliland).

*Nymphalis hansali*, Kirby, *Cat. Diurn. Lep.* p. 267. n. 5. (1871) (Bogos).

♂ ♀. *Body above* olivaceous russet, abdomen russet olive ; dot before antenna and line behind eye conspicuous ; *underside* as in *pelias*, red brown stripes less bright,

hazel colour, abdomen white, with a rather narrow brown median line, ventral edge of palpi brown.

♂. *Wings* similar in pattern and shape to those of *Ch. pelias saturnus*.

*Upperside* brownish black, purplish, basal area russet or sepia colour, discal band, postdiscal and admarginal spots maize yellow.—Forewing: cell-bar 3 vestigial, 4 mostly large and fused with bar D and the series of median bars, the russet or sepia colour stopping midway between  $M^2$  and  $M^1$ ; median bars  $M^1$ — $SM^2$  ill-defined proximally, continuous, bar  $R^3$ — $M^1$  about 3 mm. more distal, continuous with bar  $R^2$ — $R^3$ , bars  $SC^5$ — $R^2$  again about 4 mm. more distal, also fused together, the whole area between these median bars and cell-bar 4 more or less uniformly black, the proximal limits of the median bars  $SC^5$ — $M^1$  being generally vestigial only in side-light; on account of the position of the median bars the yellow discal band consists of three portions, which are again divided by the veins, last portion about 6 mm. broad, portion  $R^1$ — $M^1$  4 mm., portion  $SC^5$ — $R^1$  (sometimes with a streak before  $SC^5$ ) 3 mm. broad and scarcely touching portion  $R^1$ — $M^1$ , concave proximally; the discal bars  $SC^4$ — $M^1$  are fused together and joined along veins to postdisco-marginal area, hence the yellow postdiscal interspaces reduced to a series of spots of which spots  $R^1$ — $M^1$  are minute or just traceable, while spot  $SC^4$ — $SC^5$  is 2 to 4 mm. long and  $1\frac{1}{2}$  to 2 mm. broad: marginal spots, especially the middle ones, less extending proximad than in *pelias*.—Hindwing: discal band extending to  $M^2$ , somewhat narrowing behind, basal area shaded at band with maize yellow scales, median bar C— $SC^2$  visible; abdominal fold grey, brown median bars  $M^2$ — $SM^3$  often vestigial, separating a triangular patch near anal angle from rest of abdominal fold, outer edge of band slightly concave from C to  $R^3$ , often rounded-sinuate between  $R^3$  and  $M^1$ ,  $M^1$  and  $M^2$ , crossing R at bent of this vein and  $M^1$  4 to 5 mm. from its base; 3 to 5 blue submarginal spots, last two fused together; series of admarginal, maize yellow, interspaces complete, the interspaces separated, about as thick as the black marginal line, transverse, anal one greenish.

*Underside* hazel, much less bright red than in *Ch. pelias*, postdiscal band of interstitial patches of about the same colour as the basal area, discal band creamy, bars in basal area as in *Ch. pelias saturnus*.—Forewing: olive black, discal spots  $SC^4$ — $M^2$  as in *saturnus*, postdiscal interstitial patches gradually smaller towards  $SC^4$ , the upper patches not larger than the respective black discal spots, the white interspaces at their proximal side about as large as those patches, much larger than in *Ch. pelias*; black postdiscal spots as in *saturnus*; marginal interspaces creamy white at edge of wing.—Hindwing: median bars rather heavier than submedian ones, submedian longitudinal bar  $M^2$ —( $SM^1$ ) joined to short median bar  $M^2$ —( $SM^1$ ); discal bar  $R^2$ — $R^3$  heavy, discal bar  $M^1$ — $M^2$  present as a thin line; no red brown patch before C at outer side of costal median bar; postdiscal hazel-coloured band narrower than in *saturnus*, the grey angles less conspicuous; postdiscal black bars C— $R^2$  represented by longitudinal spots; nearly all the blue submarginal dots marked; admarginal interspaces as wide as in ordinary *saturnus*, creamy white, greenish buff proximally, upper ones somewhat ochraceous, anal one greenish buff; dentition of wing as in *Ch. pelias saturnus*, upper tail 5 to 6 mm. long, second 8 to 9 mm.

♀. Like ♂, larger, postdiscal interstitial spots  $R^1$ — $M^2$  of the upperside of the forewing larger; upper tail 11 mm., second 12 mm.

Length of forewing: ♂, 41—43 mm.

“ “ ♀, 50 mm.

Penis similar in shape to that of *Ch. pelias*; besides the subapical tooth, which is strong, there is farther back a series of teeth of which the three last ones are dorsal, the others sinistro-lateral.

*Hab.* Abyssinia; Bogos and Shoa; the mountainous parts of Somaliland bordering on Abyssinia. In the Tring Museum 4 ♂♂, 1 ♀.

♂. Discal interstitial band of upperside ochraceous to orange.

#### 60. *Charaxes pelias*.

*Papilio Eques Achirus pelias* Cramer, *Pap. Exot.* I. p. 5. t. 3. f. c. D (1775) (Cap. b. sp.).

*Papilio Eques Achirus castor*, Fabricius, *Gen. Ins.* p. 251. n. 30—31 (1776) (pt.).

*Papilio Eques Achirus pollux*, Gmelin, *Syst. Nat.* I. 5. p. 2235. n. 302 (1790) (pt.).

♂ ♀. *Body* above ochraceous tawny, head and pronotum more tawny, dots on head obsolete, white line behind eye conspicuous; *beneath* dirty white, white stripe on palpi very broad, the ventral tawny or brown line reduced basally to a few scales, third segment black, second segment often with black or deep brown scales in apical half along white stripe; breast with oblique, dirty white, black and tawny stripes; anterior legs black above, white beneath; abdomen white beneath, bases of segments more or less extended fulvous or brownish black.

♂. *Wings* above basal area varying from tawny ochraceous to blackish brown.—Forewing: cell-bar 3 sometimes vestigial, 4 heavy; no submedian bars; median bars  $R^3$ — $SM^2$  in a nearly straight row, bar  $R^3$ — $M^1$ , however, a little more distal, bars  $R^3$ — $M^2$  very heavy, patch-like, straight or slightly concave distally, bar  $R^2$ — $R^3$  fused with bar D to a hammer-shaped mark, bars  $SC^1$ — $R^2$  large, fused together, bar  $R^1$ — $R^2$  produced basad to near bar D; discal interspaces forming a pale ochraceous band which is 5 or 6 mm. wide at  $SM^2$ , of nearly the same width up to  $R^3$ , broken at  $R^2$ , the portion  $SC^1$ — $R^2$  being more distal than the main part of the band; the band limited distally by a series of discal bars extending from  $SC^1$  to  $M^2$ , the upper two bars larger than the others, fused together, the three or four posterior ones often halfmoon-shaped, bar  $M^2$ —( $SM^1$ ) sometimes vestigial; black postdisco-marginal band proximally regularly sinuate between the veins from  $SC^1$  to  $M^2$ , the black scaling extending basad along these veins, including a series of ochraceous admarginal interspaces which vary very much in size, and are at least as wide as, generally much wider than, the black scaling at the veins which separates them, the interspaces  $M^2$ — $SM^2$  often not separated.—Hindwing: a triangular, pale ochraceous, discal band from costal margin to  $M^1$  or  $M^2$ , anteriorly whitish buff, its inner edge reaching  $M^1$  at base of this vein; abdominal margin of wing grey, abdominal fold brownish grey; disco-submarginal area black; pale blue submarginal spots conspicuous, the posterior ones largest, the series generally not extending costad beyond  $R^3$ , but occasionally reaching  $SC^2$ ; admarginal interspaces halfmoon-shaped, upper ones pale ochraceous, the others creamy white, shaded with ochraceous at internervular folds, anal one olive buff, somewhat greenish or yellowish, size of these spots very variable, the spots sometimes touching each other, rounded triangular, nearly as in *Ch. jason*, while in other individuals the spots are widely separated and not thicker than the black marginal line.

*Underside* reddish cinnamon rufous or chestnut, postdiscal and admarginal interspaces of forewing and upper admarginal ones of hindwing ochraceous, discal band white; basal to median bars black with centres olive grey, edged with white.—Forewing: costal edge in basal half olive grey; cell-bars 2 and 3



rounded at ends, bar 4 inclusive white border at least as broad as apical interspace of cell; submedian and median bars  $M^1$ — $SM^2$  close together, mostly merged together, median bar  $R^3$ — $M^1$  about  $2\frac{1}{2}$  mm. from base of  $M^1$ , bar  $R^2$ — $R^3$  just in front of it, separated from bar D, which latter is much wider in front than behind, or touching it, bars  $SC^4$ — $R^2$  fused to a short broad band, which is only 5 mm. from base of  $R^2$  and measures 3 mm. in width (incl. white border); white discal band generally with a rufous ochraceous spot between  $SC^5$  and  $R^1$ , often with a smaller spot before  $SC^5$  and a third before  $R^3$ ; at the outer edge of the band stands a series of olive black spots  $SC^4$ — $M^2$  representing the discal bars, the band divided by the veins into square patches from  $R^3$  to  $SM^2$ ; postdiscal ochraceous interspaces triangular, or partly halfmoon-shaped, touching with tips the postdiscal black spots of which the last ones are large and the upper ones sometimes absent, these spots rounded distally, concave or straight proximally, interspaces between them and submarginal interspaces all olive grey, this scaling often slightly glossy at edges of spots, forming a ring or half-ring round the spots; admarginal interspaces as above separated by olive grey scaling which changes into black scaling at extremities of veins.—Hindwing: basal costal bar long, reaching from base of C to end of PC, curving distad at end, often distinctly S-shaped; no subbasal bar C— $SC^2$ ; costal submedian bar oblique, posteriorly close to PC, bar C— $SC^2$  a little more distal, touching  $SC^2$  just between cell-bars 2 and 4; submedian bar  $M^2$ — $SM^1$  beginning just before point of origin of  $M^2$ , longitudinal; median bars C— $M^2$  almost continuous, costal bar more proximal, with a brown red spot at outside, bar  $R^2$ — $R^3$  fused with bar D (or absent?), bar  $R^3$ — $M^1$  absent, bar  $M^2$ —( $SM^1$ ) much more distal, about 10 mm. from base of  $M^2$ , close to discal abdominal bar; black lines upon abdominal fold inclusive white borders wider than their brown red interspaces; white discal band broadest at C, gradually narrowing to  $M^2$ , the white interspace at abdominal margin between transverse median and discal bars joined to the band; besides the discal bars beyond  $M^2$ , which are fused to one line, there is a short and heavy bar  $R^2$ — $R^3$  at outer edge of band; postdiscal brown red interspaces triangular, pointing distad, except interspace  $M^1$ — $M^2$ , bordered by olive grey lines distally which form acute angles upon and between veins; postdiscal bars represented by olive scaling at the distal points of these angles, but bar  $M^2$ — $SM^2$  black; last postdiscal interspaces  $M^2$ — $SM^2$  pale ochreous, forming one long narrow halfmoon; submarginal bars transverse, black, rather thin, separate, last three or four somewhat luniform, being concave proximally, last two fused together, all the submarginal bars with blue or bluish scaling at proximal side, this scaling more blue and more extending between  $R^3$  and  $SM^2$ , with minute white submarginal dots; admarginal interspaces more or less ochraceous, with creamy white scaling at veins, posterior interspaces more greenish than yellow, anal one greenish olive buff, sometimes the ochraceous colour reduced to subrotundate spots; two tails, second longer than first.

♀. Like ♂, larger, disco-postdiscal band of upperside paler, basal area less bright, upper tail comparatively longer; abdomen below brown in middle, edges of segment white, this scaling widened at sides.

Length of forewing: ♂, 38—46 mm.

” ” ♀, 42—49 mm.

Genital armature as in *Ch. jason*.

*Hab.* Cape Colony northward to the Congo, the Victoria Nyanza and the Coast regions of Brit. E. Africa.

a. *Ch. pelias saturnus* (Nov. Zool. VII. t. 12. f. 2. ♂).

*Charaxes jasius* var., Bertoloni, *Mem. Ac. Sc. Bologna* II. p. 5. n. 1 (Separat.!) (1851) (Mozambique).  
*Nymphalis pelias*, Trimen (non Cramer, 1775), *Rhop. Afr. Austr.* I. p. 175. n. 101 (1862)  
 (Damaraland); Kirby, *Cat. Diurn. Lep.* p. 267. n. 4 (1871) (pt.).

*Charaxes saturnus* Butler, *Proc. Zool. Soc. Lond.* p. 624. n. 5. t. 36. f. 1. ♂ (1865) (Inter. of S. Afr.):  
 id., *Lep. Erot.* p. 5. t. 2. f. 2. ♀ (1869) (♀, Congo; Zambesi); Druce, *Proc. Zool. Soc. Lond.* p. 412. n. 2. (1875) (Angola); Auriv., *Öfvers. Vet. Ak. Förl.* XXXVI. 7. p. 41 (1879) (Damaraland); Spiller, *Entom.* XV. p. 8 (1882) (Natal); Butl., *Ann. Mag. N. H.* (5). XII. p. 101 (1883) (Vict. Nyanza); Dewitz, *Nor. Act. Leop. Cur. Ak. Naturf.* L. 4. p. 371 (1887) (Lumami R., II. III. V. VIII.); Trim. & Bowk., *S. Afr. Butt.* I. p. 334. n. 110 (1887) (Natal; Transvaal); Trim., *Proc. Zool. Soc. Lond.* p. 80. n. 34 (1891) (Omrora, VIII.; Ebanda, IX.); Hamp., *Ann. Mag. N. H.* (6). VII. p. 189 (1891) (Sabaki R.); Butl., *Proc. Zool. Soc. Lond.* p. 647. n. 16 (1893) (Nyassaland, I.); Trim., *ibid.* p. 41. n. 62 (1894) (Manica); Butl., *ibid.* p. 251. n. 6. (1895) (Zomba); id., *l.c.* p. 720. n. 8 (1895) (Zomba); Holl., *Proc. U. St. Nat. Mus.* XVIII. p. 753. (1895) (Brit. E. Afr.); Butl., *Ann. Mag. N. H.* (6). XVIII. p. 68. n. 3 (1896) (Deep Bay, Nyassa, II.); Lanz, *Iris* IX. p. 140 (1896) (Tanganyika); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 354. n. 11 (1896) (Congo; Angola; Tanganyika; Zomba; Taita; Zambesi; Delagoa B.; Matabele; Dnrban; Damaraland); Dist., *Ann. Mag. N. H.* (7). I. p. 51 (1898) (Pretoria, II. XII.; Rustenburg, XII.); Butl., *Proc. Zool. Soc. Lond.* p. 188. n. 2, p. 904. n. 6. (1898) (Masbionaland).

*Nymphalis saturnus*, Dewitz, *l.c.* XLI. 2. 2. p. 828 (1879) (N. Angola).

*Charaxes pelias*, Vollenb., *Tijdschr. v. Ent.* XV. p. 15. n. 6. (1872) (Lower Guinea); Gooch, *Entom.* XIV. p. 6 (1881) (Natal); Westwood, in Oates, *Matabeleland* ed. II. p. 349. n. 43. (1881) (Seruli R., VIII.; Victoria Falls, I.); Staud., *Erot. Tagf.* t. 58. ♂ (1886) (Transvaal).

*Charaxes pelias* var. *saturnus*, Staudinger, *l.c.* p. 168 (1886) (Transvaal; Congo); Reb. & Rog., in Baumann, *Massailand* p. 332. n. 96 (1894) (Ussui & Ussure, Germ. E. Afr.); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 232. sub n. 5 (1899) (Congo to Damaraland, Natal northward to Brit. E. Afr.).

♂ ♀. *Wings, above*.—Forewing: postdiscal ochraceous interspace SC<sup>1</sup>—SC<sup>5</sup> at least 4 mm. long, the other postdiscal interspaces also larger than the black discal bars at their proximal side.—Hindwing: obviously triangular, admarginal interspaces R<sup>1</sup>—R<sup>3</sup> thicker than, or as thick as, the black marginal line.

*Underside* reddish cinnamon rufous.—Forewing: postdiscal ochraceous spots large, triangular, very much larger than the black discal and postdiscal spots SC<sup>1</sup>—M<sup>2</sup>, postdisco-submarginal olive grey scaling pale bluish in side-light.—Hindwing: costal bars separate, at least basal costal bar not joined to the submedian and median costal bars; brown red interspaces upon abdominal fold as wide as, or wider than, the olive black lines (white borders excluded); postdiscal brown red patches R<sup>2</sup>—M<sup>2</sup> as wide as the respective partitions of the white discal band or even wider; ochreous spots in admarginal interspaces extended, expanded between veins; dentition of wing acute, tails slender and long, in ♂ upper one 4 to 6 mm., second 9 to 10 mm., in ♀ longer.

In the ordinary form the admarginal interspaces SC<sup>2</sup>—R<sup>3</sup> of the hindwing above measure about 2 to 3 mm. in a basi-distal direction.

The following two forms deviate from the normal in a remarkable way:

a<sup>1</sup>. *Ch. pelias saturnus* ab. (loc.?) *laticinctus*.

*Charaxes saturnus* var. *laticinctus* Butler, *Proc. Zool. Soc. Lond.* p. 252. sub n. 6 (1895) (Kondeland); id., *l.c.* p. 822. n. 9 (1896) (Vuwa, west coast of L. Nyassa, VIII.); id., *l.c.* p. 851. 852. n. 10 (1896) (Nyassaland).

The admarginal interspaces of the hindwing about as wide as in *Ch. jason*.

This form seems to be found especially often in Nyassaland, but apparently

occurs also farther north and east, there being an example from Mpwapwa in the Berlin Museum which comes very near typical *lutieinctus*.

*b. Ch. pelias saturnus* ab. (loc.?) *brunnesceus* Rothsch., ab. nov.

The basal area of the wings *above* brownish black, more chocolate near base, disco-postdiscal band deeper yellow than in ordinary *saturnus*, the admarginal spots of the forewing small and much shaded with brown, much darker than the postdiscal interspaces both above and below, hindwing rather shorter than in ordinary *saturnus*, the admarginal interspaces larger than in *pelias pelias*, but not thicker than the heavy, black, marginal line, interspaces  $R^2-M^2$  shaded with blue; discal band of hindwing scarcely reaching  $R^3$ , only 4 mm. wide at  $SC^2$ . On *underside* the white discal band of the hindwing is narrower than in ordinary *saturnus*, and the black marginal line is heavier.

This form, which resembles somewhat *pelias pelias*, occurs in northern Angola.

*Hab.* *Ch. pelias saturnus* occurs from Natal to the Congo, Victoria Nyanza, and the coast regions of British East Africa; it is a rather common species in Nyassaland. In the Tring Museum 31 ♂♂, 6 ♀♀ from: Natal; Delagoa Bay; Likoma, Nyassaland, caught in June, July, August (Rev. Dutton); Bandawe, Nyassaland, March (Watkinson); Parumbira, October (Dr. Ansorge); Mombasa; Angola; Congo. A specimen said to be from Uganda was given to Dr. Ansorge by Capt. Williams.

Congo individuals are rather large; the blue submarginal spots of the upperside of the hindwing are often large, but not always larger than in individuals from other places; the base of the forewing above is sometimes as bright tawny orange as in Nyassaland specimens.

Dr. Trimen, *l.c.*, says that "in Damaraland, where Mr. J. A. Bell found it rather abundant, the butterfly was commonly found on the droppings of the larger animals. In Natal it would appear to be rare, Col. Bowker having sent me only an example, which was taken on an orange-tree at Pinetown, and another ♂ captured at the same place in April 1883."

*b. Ch. pelias pelias.*

*Papilio Eques Achirus pelius* Cramer, *l.c.*; Goeze, *Ent. Beytr.* III. 1 p. 82. n. 46 (1779); Herbst, *Naturs. Schmett.* IV. p. 62. n. 153. t. 63. f. 5. 6. (1790) (syn. ex parte; "Guinea" loc. err.).

*Eriboea pelopia* (!) Hübner, *Verz. bek. Schmett.* p. 47. n. 424 (1816-27).

*Nymphalis pelias*, Godart, *Enc. Méth.* IX. p. 351. n. 2 (1823) (Cap. b. sp.); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 20 (1850); Trimen, *Rhop. Afr. Austr.* I. p. 175. n. 101, II. p. 340 (1862) (pt.); Kirby, *Cat. Diurn. Lep.* p. 267. n. 4 (1871).

*Charaxes pelius*, Butler, *Proc. Zool. Soc. Lond.* p. 624. n. 4 (1865) (Cap. b. sp.); id., *Lep. Ex.* p. 25. n. 1. t. 10. f. 5. ♀ (1869) (Cap. b. sp.); Stand., *Exot. Tagf.* p. 168 (1886); Trim. & Bowk., *S. Afr. Butt.* I. p. 331. n. 109 (1887) (Cape Colony, western distr.) *id.*, *l.c.* III. p. 407 (1889) (Febr.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 335. n. 12 (1896); Auriv., *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 232. n. 5. (1899) (Cape Colony).

♂♀. *Wings above* basal area blackish brown.—Forewing: postdiscal pale ochraceous interspaces smaller than the black discal bars resp. spots at their proximal side; cell-bar 4 large and square.—Hindwing shorter than in *saturnus*, admarginal interspaces smaller, widely separated, thinner than the heavy, black, marginal line.

*Underside* reddish chocolate, bars pale grey with thin black and white borders, interspaces between them narrower than in *saturnus*, black outer borders of median bars of fore- and hindwing much heavier than the proximal borders.—Forewing : discal bars SC<sup>4</sup>—M<sup>2</sup> heavier than in *saturnus*, larger than the small ochraceous, postdiscal spots, black postdiscal spots (bars) SC<sup>4</sup>—M<sup>1</sup> obsolete or small.—Hindwing : reddish chocolate interspaces on abdominal fold very thin, except that near basal abdominal margin ; basal to median costal bars fused, resp. touching each other ; postdiscal reddish chocolate patches smaller than in *saturnus*, not so wide as the white discal band ; admarginal interspaces with yellow spots which are widely separated, at least the upper ones ; edge of wing bluntly dentate, tails shorter and broader than in *saturnus*, upper tail 2 to 3 mm. long, second 4 mm.

Length of forewing : ♂, 38 mm.

" " ♀, 45 mm.

*Hab.* Cape Colony. In the Tring Museum 1 ♂.

"This is the only South-African *Charaxes* known to inhabit the open mountainous western tracts of the Cape Colony," says Dr. Trimen, *l.c.* "Specimens have reached me from Genadendal (Rev. G. Hettarsch) and Montagu (Mr. L. Taats), and I noticed it in Bain's Kloof in January 1876. Having heard from Dr. D. R. Kannemeyer that the species occurred abundantly at Montagu, I visited that locality in January 1876, but did not succeed in taking any examples, although I saw four during my two days' stay. I found that, as my correspondent reported, the butterfly haunted the 'Wagenboom' (*Protea grandiflora*), sitting close until accidentally disturbed, when it darted away with great rapidity, and would settle on some distant bush of the 'Wagenboom,' not returning to its former station, as is the habit of so many species of *Charaxes*. Dr. Kannemeyer, however, who had a very much more intimate acquaintance with *pelias* than I enjoyed, noted that it commonly showed a preference for some particular twig, generally a withered one ; it was most prevalent at the end of November and beginning of December. Mr. Taats took it, in the same locality, 'flying about willows,' February. I think it very probable that the larva feeds on the Wagenboom, and that the butterfly will be found all through the mountainous country where that fine shrub or small tree prevails."

j<sup>5</sup>. Discal band of upperside obscurely indicated or absent.

k<sup>6</sup>. Hindwing with small blue postdiscal spots above.

## 61. *Charaxes jason*.

*Papilio Eques Achivus jason* Linné, *Syst. Nat.* ed. XII. p. 749. n. 26 (1767) (Barbaria) ; Drury, *Illustr. Ex. Ins.* I. p. 1. t. 1. f. 1. 2. and Index (1772) (Smyrna) ; Cramer, *Pap. Exot.* II. p. 136. t. 186. f. A. B (1777) (Smyrna) ; Stoll, in Cramer, *Pap. Exot.* IV. p. 78. t. 329. f. A. B. ♀ (1782) (Smyrna).

*Papilio Eques Achivus jasius* Linné, *l.c.* (Errata) ; *Onomat. Hist. Nat.* VI. p. 80 (1775) ; *Fabr., Syst. Ent.* p. 449. n. 29. (1775) (syn. ex parte ; Barbaria) ; Goeze, *Ent. Beytr.* III. 1. p. 50. n. 26 (1779) (pt.) ; *Fabr., Spec. Ins.* II. p. 10. n. 40 (1781) (syn. ex parte ; Barbaria) ; *Fabr., Mant. Ins.* II. p. 6. n. 44 (1787) ; Cyrrillo, *Ent. Neapol. Spec. prim. t.* 2. f. 1 (1787) ; Herbst, *Naturs. Schmett.* IV. p. 67. n. 155. t. 64. f. 3. 4. 5 (1790) (Africa) ; Gmel., *Syst. Nat.* I. 5. p. 2234. n. 26. (1790) (pt.) ; Giorna, *Calend. Ent.* p. 99. (1791) (metam.) ; Petagna, *Institt. Ent.* II. p. 443 n. 1. (1792) (Naples) ; Prunner, *Lep. Piedmont.* p. 2. n. 2. (1798) ; Esper, *Schmett.* I. t. 99. cont. 54. f. 1. 2. ♂, ♀ t. 104. cont. 59. f. 2-7. metam. *Suppl. Tageschmett.* p. 29. n. 187 and p. 61. (1805) (Nizza, end of Sept., habits, metamorph.).

*Papilio (Achivus) jasius*, Müller, *Naturs.* V. 1. p. 573. n. 26 (1776) (Barbaria).



- Papilio Nymphalis jasius*, Fabricius, *Ent. Syst.* III. 1. p. 61. n. 191 (1793) (syn. ex parte; *Barbaria*).
- Nymphalis jasius*, Latreille, *Hist. Nat. Crust. Ins.* XIV. p. 83. n. 1 (1805) (Nizza); Godart, *Enc. Méth.* IX. p. 350. n. 1 (1823) (Barbary; Spain; Portugal, Sicily, Naples, S. France, Nizza; Corsica; Hyères; Dalmatia; Constantinople; Asia Minor).
- Papilio Nymphalis rhea* Hübner, *Samml. Eur. Schmett.* p. 19. n. 1. I. f. 111. 112. 580. 581 (1805-21).
- Eriboea unedonis* Hübner, *Verz. bek. Schmett.* p. 47. n. 423. (1816-27).
- Papilio jasius*, Ochsenheimer, *Schmett. Eur.* 1. p. 151. n. 1 (1807); Godart, *Hist. Nat. Lep. Fr.* II. p. 81. n. 27. t. 10. f. 3. 4 (1822) (metam.).
- Charaxes jasius*, Ochsenheimer, *Schmett. Eur.* IV. p. 18 (1816); Boisduval, *Spec. Gén.* I. t. 5. b. f. 12 (1836); Duponch., *Bull. Soc. Ent. Fr.* p. 59 (1837); id., *Ann. Soc. Ent. Fr.* p. 193 (1837) (larva); Thon, *Naturg. Schmett.* p. 72. t. 32. f. 507. 508 (1837); Herr.-Schäff., *Schmett. Eur.* I. p. 45 (1843); Doubl., *List. Spec. Lep. Ins. Brit. Mus.* I. p. 110 (1844); Duponch., *Cat. Méth. Lep. Eur.* p. 11 (1844) (Spain; Provence; Italy; Turkey; June, Sept.); Pierr., *Bull. Soc. Ent. Fr.* p. 41 (1849) (Hyères); Bertol., *Mem. Ac. Sc. Bologna* II. p. 5. n. 1 (Sep.!) (1851) (ex parte); Girard, *Bull. Soc. Ent. Fr.* p. 6 (1864); Pierr., *Bull. Soc. Ent. Fr.* p. 52 (1864) (Hyères); Staud., *Cat. Lep. Eur. Faun.* p. 15. n. 192 (1871) (Maurit.; Iberia; Gall. mer.; Italia; Dalmat.; Graecia); Pears., *Ent. Mo. Mag.* X. p. 113 (1873) (Mentone; habits!); Saiger, *Ent. Nachr.* II. p. 156 (1876); Nolek., *Stett. Ent. Zeit.* XLIII. p. 174 (1882) (Cannes, larva); Ragusa, *Nat. Sic.* VII. p. 31 (1884); Calberla, *Iris* I. p. 130 (1885) (Civitavecchia, VI.; Firenze, X.); Honr., *Sitz.-Ber. Berl. Ent. Zeitschr.* p. 18 (1887) (Dalmat.; Lisboa); id., *l. c.* p. 21 (1891) (Dalmat.; Lisboa); Dönitz, *ibid.* (Portugal); Norris, *Entom.* XXIV. p. 179 (1891) (Corfu, habits); id., *Entom.* XXV. p. 95 (1892) (R. Magra, Italy, Oct.); Bromil., *ibid.* p. 323 (1892) (Nizza); id., *l. c.* XXVI. p. 219 (1893); Staud., *Entom.* XXVI. p. 262 (1893) (Ajaccio); Rühl, *Palaeart. Grossschm.* I. p. 320. 771 (1892-95); Chapm., *Ent. Rec.* p. 191 (1894).
- Apatura jasius*, Boisduval, *Ind. Meth.* p. 14 (1829) (Provence, May, Sept.).
- Paphia jasius*, Duponchel, *Icon. Chenill.* I. p. 167. n. 69. t. 24. f. 68. a. b. c. d (1832) (metam.).
- Nymphalis jason* Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 308. n. 1 (1850) (S. Eur.; As. Min.; Barbary); Kirby, *Cat. Diurn. Lep.* p. 267. n. 1 (1871).
- Charaxes*, Rambur, *Lep. Andal.* p. 18 (1858) (Cadiz).
- Nymphalis iasius*, Müller, *Zool. Jahrb.* I. p. 505 (1886) (larva, pupa).
- Charaxes jason*, Butler, *Proc. Zool. Soc. Lond.* p. 623. n. 1 (1865) (S. Europe; Asia Min.; Barbary); id., *Cat. Diurn. Lep. descr. by Fabr.* p. 54. n. 16 (1869); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 355. n. 13 (1896) (Corsica; Spain; S. France).

♂ ♀. Similar to *Ch. epijasius*. Body and wings above more brown.

*Wings, upperside*.—Forewing: basal half of costal margin russet tawny like head and pronotum; black bars vestigial, in side-light the interspaces appearing paler than the bars; postdiscal interstitial spots orange, the series almost straight, slightly curving costad anteriorly, nearer outer edge in front than behind, upper spots largest, spot SC<sup>4</sup>—SC<sup>5</sup> of about the same size as the respective admarginal spot, often somewhat smaller or larger, spots R<sup>3</sup>—SM<sup>2</sup> transverse, posterior ones often obsolete; admarginal interstitial band as in *epijasius*, deeper in colour, orange. —Hindwing: discal band represented by a white patch at costal margin, the patch much shaded with brown, often vestigial down to R<sup>2</sup>, generally with one to three tawny patches or spots at outside; admarginal band of interspaces rather variable in width, the upper patches sometimes not longer than broad, while in other individuals they are as long as in *epijasius*, orange, posterior ones paler, distally shaded with greenish buff, anal one greenish buff; black marginal line heavier than in *epijasius*, its breadth measuring between R<sup>1</sup> and R<sup>2</sup> often more than half the length of patch R<sup>1</sup>—R<sup>2</sup>, but generally only one-third the length of this patch: a series of pale blue submarginal dots from R<sup>3</sup>—SM<sup>2</sup>, spots SC<sup>2</sup>—R<sup>3</sup> sometimes vestigial.

*Underside* as in *epijasius*, basal area brighter ferruginous red, postdiscal and admarginal interstitial patches of forewing deep orange, olive black median bars of

both wings thinner.—Forewing: orange patches in white discal band small or obsolete, hence the white colour more extended anteriorly than in *epijasius*; orange postdiscal spots longer anteriorly than towards internal margin, posterior ones transverse; submarginal olive grey scaling sharply defined distally; the admarginal orange patches smaller than above.—Hindwing: median series of bars concave from C—R<sup>3</sup>, often almost straight, median bar M<sup>1</sup>—M<sup>2</sup> a little more distal than in *epijasius*; white discal band concave distally between C and R<sup>3</sup>, of about even width, generally widest before R<sup>3</sup>, about 2½ mm. broad at R<sup>1</sup>; discal bar R<sup>2</sup>—R<sup>3</sup> distinct as a rule, often well within white band, seldom absent; postdisco-submarginal area as in *epijasius*, width somewhat variable; admarginal chrome coloured band somewhat narrower than above, in some specimens half as wide again as in others, limited proximally by the submarginal bars, which are transverse, the upper ones being, however, sometimes uniform, while the last ones are curving basad at ends towards the postdiscal bars; upper tail 4 to 5 mm., second 8 to 9 mm.

♀. Paler than ♂, larger; median bar R<sup>3</sup>—M<sup>1</sup> of underside of hindwing often present, pale blue spots of upperside of hindwing sometimes enlarged to patches which nearly touch each other; tails longer; abdomen olive black beneath, segments edged with white, this scaling often extended at each side to a streak.

Length of forewing; ♂, 37—42 mm.

" " ♀, 40—47 mm.

Clasper (Pl. VIII. f. 29) with the dorsal edge in dorsal view almost straight, suddenly curved before end, hook therefore strongly curved; penis (Pl. VIII. f. 11) thick, curved before end, with one strong dorsal tooth at the bent and often one or two smaller ones close behind; penis-funnel moderately narrowed towards end, apex rather flat, broad, apical edge turned down, triangular, pointed.

*Hab.* Mediterranean countries, where the food-plant, *Arbutus unedo*, is abundant, in two broods: the old writers received it from Asia Minor, but there is apparently no recent record of the species from there. The admarginal orange respectively chrome coloured band of the upperside is apparently wider in specimens from Greece than in individuals from the western parts of the Mediterranean subregion.

The egg, larva and pupa were discovered by Prunner, a German, who was an officer in the Sardinian army, and were figured and described by Esper (*l.c.*). Since then many accounts of the life history and the habits of *Ch. jasius* have been published. The egg, larva and pupa agree in structure with those of other *Charaxes* (see p. 282). The larva when quitting the egg is brownish green, but soon becomes brilliant green, sometimes somewhat bluish. There is a yellowish green, oval, dorsal patch on the third and fifth abdominal segments each, which are bordered by a dark line, and in the full-grown caterpillar become more or less blue centrally, or nearly all blue; central horns green or yellow basally, red apically, lateral horns red, externally yellow, with a stripe which extends to the mouth and is posteriorly bordered black. When the caterpillar has cast its skin the horns are first very short, but soon grow to normal size. The caterpillar lives on the upperside of the leaf, where it spins a kind of web which enables it to fasten itself on the leaf. Mr. Pearson gives, *l.c.*, the following description of the early stages of *Ch. jasius*:

"I was fortunate enough in the course of last winter and spring, spent at Mentone on the shores of the Mediterranean, to find the larva of this species in some

abundance, and trust that the following notes on its habits may prove of interest. The larvae were found on either slope of one of the numerous valleys which intersect the lower parts of the splendid amphitheatre of hills surrounding Mentone. These slopes are covered with a scrub consisting, for the most part, of myrtle, arbutus, and lentiscus. Having by chance discovered a small individual on an arbutus scrub, I was induced to search farther, when I found the larvae to be by no means uncommon. They were easily discovered, in spite of their colour approximating closely to that of their food plant, as they remained always on the upper surface of the leaf on the silken carpet to be after mentioned, which also greatly assists their detection. The arbutus shrubs were generally of small growth, although in some places they attained to 9 or 10 feet; the stunted plants I found, however, to be the most productive, especially when isolated. On only three occasions did I find more than one larva on a bush, viz., on two of these occasions two, and on the other no less than five. The larvae had hibernated, being all found during the month of January, and were about half grown, with the exception of three which did not exceed half an inch in length.

"A very good description of the caterpillar will be found in MM. Duponchel and Guenée's '*Iconographie des Chenilles*'; the only remark I have to make on this head being, that in my specimens there was an evident difference in the shades of green exhibited by the larvae when seen together, some being darker, and of a bluish green, while others were more of a yellowish green. The difference in colour did not arise, as I at first thought it might, from the amount of shade enjoyed by the shrubs, as the darkest larva was found on a small plant of a foot and a half in height exposed to the full rays of the sun. The oval dorsal marks on the seventh and ninth segments were also much more strongly marked in some specimens than in others.

"The larvae of this species are very easily reared, being very sluggish and rarely moving from the leaf on which they may be resting at the time until it, or those within reach, are consumed. When they do move, it is only for a short distance, and they invariably retreat again to the original leaf on which their web is spun. This web consists of fine threads of silk closely plastered over the upper surface of the leaf, so as to give it a white, shiny appearance. It seems absolutely necessary to the larva to enable it to cling to the leaf, and one of its first proceedings on going to a new leaf is to spin this coating of silk over the surface. Thus one small larva, from some defect in its spinning apparatus, was unable to weave the usual carpet for itself, although it kept incessantly going through the usual motions for doing so, moving its head from side to side. It was constantly falling off the twig on which it was placed, and had to be replaced several times a day, till at length it fell off and was lost. They feed principally during the night, remaining inactive during the day, except when it is bright and fine, when, strange to say, they begin to eat as vigorously as on the approach of evening. They are not voracious feeders, however, and eat by fits and starts, never consuming much at a time. They have also a curious habit, when exposed to a strong sun, of extending and retracting the segments of their bodies, as if they appeared to enjoy the heat. When once they begin to eat a leaf, they seldom commence another till they have completely finished it, gnawing the midrib down to the very stem. Although found in dry localities, and in a region subject to little or no rain, they seem to be fond of moisture. I was in the habit of sprinkling their food with water, and I have often noticed them drinking up the drops. In a state of repose, the larva attaches itself to the leaf by its four pairs of



claspers only, the anal pair and feet proper being elevated, and the horns lying along the back. Several days before molting, the new head appears in the form of a square dark green patch immediately behind the existing horns. This patch is bounded on each side by a rose-coloured border, ultimately proving to be the new horns; these last are at first very lax and drooping, but soon gain their normal position. There is a marked difference in the size of the head after the last moult, it being then nearly twice its former size; the horns, also, instead of being perfectly straight, are curved slightly downwards towards the back. When about to pupate, the larva becomes of a clear transparent green, and rather shrunk in size, and if placed in the sun becomes very restless, generally ending by falling off the food plant. It then spins a small ball of silk on the under side of a leaf, either on the midrib or on the edge, to which it attaches itself by the tail and hangs there with its head directed upwards towards the under part of the body for three days (sometimes a few hours more, sometimes a few hours less), when it changes to a smooth, stout, whitish-green chrysalis. It remains from twenty-five to twenty-seven days in pupa. The day previous to emergence, the wing-cases appear suffused with a rich purple, the double border of gamboge spots at the outer margin of the forewings being very distinct. If the day be warm, the perfect insect generally emerges during the early part of the next day; if, however, the weather be dull or cold, it often does not emerge till late in the afternoon, or in the evening."

The butterfly has the rapid flight of its congeners. It is sometimes observed sitting on the stems of trees, and is occasionally attracted by dry fruits, figs for instance.

ℓ<sup>6</sup>. Hindwing above with a very large, triangular, blue patch.

## 62. *Charaxes epijasius*.

- Charaxes epijasius* Reiche, in Ferr. & Gal., *Voy. Abyss.*, *Ent.* p. 469. t. 32. f. 1. 2 (1849) (Abyssinia); Feisth., *Ann. Soc. Ent. Fr.* p. 257. n. 9 (1850) (Senegal; *ab.*); Butl., *Proc. Zool. Soc. Lond.* p. 623. n. 2 (1865) (Senegal); *id.*, *Ann. Mag. N. H.* (4) XVIII. p. 481. (1876) (Atbara); Godm. & Salv., *Proc. Zool. Soc. Lond.* p. 223. n. 25 (1884) (Lower Niger); Staud., *Exot. Tagf.* p. 168 (1886) (Abyssinia); Honrath, *Sitz.-Ber. Berl. Ent. Zeitschr.* XXXI. p. 18 (1887) (Abyssinia); Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 190. n. 48 (1893) (Adeli, all the year round); Schaus & Clem., *Sierra Leone Lep.* p. 8 (1893); Carpenter, *Proc. R. Dublin Soc.* (2). VIII. (1895) (Lokoja); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 355. n. 14 (1896) (White Nile; Atbara; Senegal; Lower Niger); Auriv., *Kongl. Sr. Vet. Ak. Handl.* XXXI. 5. p. 232. n. 3 (1899) (Senegal; S. Leone; Togo Hinterland; Niger; Lokoja; Njam Njam; Abyssinia).
- Nymphalis epijasius*, Doubleday, *List. Spec. Lep. Ins. Brit. Mus.* App. p. 28 (1848) (Senegal); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 308. n. 2 (1850); Kirby, *Cat. Diurn. Lep.* p. 267. n. 2. (1871) (Abyssinia; Senegal).

♂ ♀. *Upperside* of body olive, head, second segment of palpi, pronotum and anterior part of mesonotum tawny russet, dots on head obsolete, line behind eye conspicuous; *underside* as in *hansali*, brown middle line of abdomen often broad.

♂. *Wings, upperside* brownish black, purplish, the median and discal bars vestigial in side-light.—Forewing: postdiscal interstitial tawny ochraceous spots partly vestigial, spot SC<sup>4</sup>—SC<sup>5</sup> often rather clearly marked; marginal interspaces widened proximad, forming a broad marginal band, chrome yellow, paler behind, 6 to 7 mm. broad at SM<sup>2</sup>, narrowing costad, incised upon internervular folds,



posterior veins thinly, upper ones heavily black, this black scaling dilated at extreme edge of wing.—Hindwing: a short, pale buff, triangular, discal band from costal margin to  $R^1$  or  $R^2$ , often reduced to a patch before  $SC^2$ ; submarginal black bars well defined, bar  $C-SC^2$  generally excepted, upper ones arched, posterior ones more straight, but curved distad at veins; the bars form the outer border of a large, pale blue, triangular patch, which is widest at  $M^2$ , reaching to base of  $M^1$ , expanded between  $C$  or  $SC^2$  and  $SM^2$ , narrowing costad, being only 2 to 3 mm. broad between  $SC^2$  and  $R^1$ ; admarginal interspaces maize yellow, forming a similar band as on forewing, very wide, upper patches widest, patch  $R^1-R^2$  measuring 6 to 7 mm. between veins, anal one greenish olive, veins within band thinly black or bluish olive: black marginal line as in *Ch. pelias saturnus*, extremely thin at anal angle, fringe heavily white, black only at tips of veins.

*Underside* as in *Ch. pelias saturnus*, slightly varying in the depth of the red and ochraceous tints.—Forewing: median bars more distal, and discal ones, which are all present, more proximal than in *saturnus*, the white discal interspaces reduced to a thin band, which, moreover, includes a series of ferruginous red patches between  $SC^1$  and  $M^2$ , hence the white band here represented only by the distal white border of the median and the proximal border of the discal bars; postdiscal interstitial patches ochraceous rufous, touching each other or faintly separated, variable in size, mostly triangular, often transverse; black postdiscal patches as in *saturnus*, variable; bluish olive grey scaling at this spot less extended than in *Ch. pelias*, partly replaced by cream coloured scaling posteriorly; submarginal black bars not vestigial; admarginal interspaces smaller than above and paler; edge of wing black at ends of veins.—Hindwing: as in *saturnus*, white discal band narrower, sometimes with ferruginous red scaling at the outer side of the median bars  $C-R^3$ , besides the patch at costal margin, median bar  $R^3-M^1$  sometimes vestigial; ferruginous red postdiscal patches and olivaceous submarginal interspaces narrower than in *Ch. pelias* owing to the extension of the admarginal interspaces; upper submarginal black bars generally rather shaded with olive grey; blue submarginal spots conspicuous; admarginal interspaces a little smaller than above, very pale buff yellow, whitish at veins distally; dentition of wing as in *saturnus*, upper tail 5 to 8 mm., second 9 to 11 mm. long.

♀. Like ♂, larger, upperside of wings a little more brown, white band of *underside* broader, and postdiscal interstitial patches of forewing less bright.

Length of forewing: ♂, 38—45 mm.

“ “ ♀, 45 mm.

Genital armature as in *Ch. jason*.

*Hab.* Abyssinia to Victoria Nyanza, Senegambia to the Niger, especially in the “Hinterlands.” In the Tring Museum 19 ♂♂, 1 ♀ from: Abyssinia, Bogos and Athara; Bulluji, Unyoro, 12. xii. '97 (Dr. Ansorge); Fajao, Unyoro, 16. viii. '97 (Dr. Ansorge). Bathurst, Senegambia; Kanakra Isl., S. Leone; Kumasi to Cape Coast, April 1899 (Capt. Giffard); Gambaga, October, November, 1898 (Capt. Giffard); Carnotville.

Feisthamel, *l.c.*, describes a sport in which the yellow colour of the band of the hindwing above has changed into a greenish colour, and in which the underside is greenish brown, with a broad middle band of a paler colour, the bars having disappeared.

D. Serrations of costal margin of forewing in basal half equal in number to the scale-rows in front of vein C.

e. Median and submedian bars of fore- and hindwing below well separated, not fused together to a narrow, brown or black, band; tail M<sup>2</sup> not spatulate.

g<sup>1</sup>. Cell-bar 4 of forewing below separated into round spots, costal and subcostal bars of basal half of hindwing represented by round spots.

### 63. *Charaxes zingha*.

- Papilio Nymphalis phaleratus zingha* Stoll, in Cramer, *Pap. Er.* IV. p. 53. t. 315. f. b. c ♂. (1780) (Afr.); Gmel., *Syst. Nat.* I. 5. p. 2312. n. 599 (1790) (S. Leone).
- Papilio Nymphalis Phaleratus berenice* Drury, *Illustr. Er. Ins.* III. p. 13 and Index t. 11. f. 1. 2. ♂ (1782) (S. Leone); Fabr., *Munt. Ins.* II. p. 48. n. 471 (1787) (S. Leone); id., *Ent. Syst.* III. 1. p. 114. n. 350 (1793).
- Papilio zinghus*, Herbst, *Naturs. Schmett.* VI. p. 151. n. 86. t. 151. f. 3. 4 (1793).
- Tigridia zingha*, Hübner, *Verz. bek. Schmett.* p. 40. n. 355 (1816).
- Nymphalis berenice*, Godart, *Enc. Méth.* IX. p. 356. n. 21. (1823) (S. Leone); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 310. n. 39 (1850) (S. Leone).
- Papilio berenice*, Donovan, *Nat. Reposit.* III. t. 107 (1825) (S. Leone).
- Charaxes berenice*, Butler, *Proc. Zool. Soc. Lond.* p. 637. n. 60 (1865) (S. Leone); id., *Cat. Diurn. Lep. descr. by Fabr.* p. 54. n. 17 (1869) (S. Leone); Dewitz, *Nor. Act. Leop. Car. Ak. Naturf. L.* 4. p. 371 (1887) (Angola, I. II. IV. X.).
- Nymphalis* (?) *zingha*, Kirby, *Cat. Diurn. Lep.* p. 273. n. 57. (1871) (Afr. occ.).
- Momura zingha*, Mabille, *Bull. Soc. Zool. Fr.* I. p. 280 (1876); Auriv., *Ent. Tidskr.* XII. p. 216. n. 146 (1891) (Cameroons); id., *l.c.* XV. p. 312. n. 205 (1894) (Cameroons); id., *Kongl. Sr. Vet. Ak. Handl.* XXXI. 5. p. 245. n. 1 (1899) (S. Leone; Ashanti; Cameroons; Mukenge; Yambuya).
- Charaxes zingha*, Standinger, *Exot. Tagf.* p. 171. t. 58. ♂ (1886) (Gabun); Godm. & Salv., in Jameson, *Story of Rear Column* p. 441. n. 89 (1890) (Yambuya).

♂. *Body* above tawny (skeleton black); palpi, head and pronotum black, white dots on head and line behind eye and creamy white lateral dot of pronotum prominent, two tawny dots on pronotum near middle, also conspicuous, patagia pale in front, edged with black. *Underside* black and pale ochraceous; palpi, middle of pro- and mesosternum, two smaller anterior and a larger, elongate, oblique, posterior, lateral spots on mesosternum and abdomen, pale ochraceous; mesosternum with three dots at hinder edge, metasternum with a patch behind coxae and a rounded lateral patch, buff or whitish; abdomen with a black line at each side of middle line; anterior legs with tip of femur, base of tibia and the tarsus white, the other legs more or less scaled ochraceous, but femora black above, with some white scales.

*Wings, upperside*, black, with a large basi-discal orange red (Chinese orange) area which forms a large triangle pointing towards apex of forewing.—On forewing the area occupies base of cell, extends to SC<sup>5</sup> or R<sup>1</sup>, its costal edge from SC<sup>5</sup>—R<sup>3</sup> has about the same direction as M, but is often somewhat concave, outer edge of area almost straight, oblique, incised upon and between veins, 5 mm. distant from outer margin of wing at R<sup>2</sup>, 8 to 9 mm. at SM<sup>2</sup>, the veins R<sup>1</sup>—R<sup>3</sup> traversing the area more or less black, patches SC<sup>5</sup>—R<sup>3</sup> thus more or less separated, varying in width, patch SC<sup>5</sup>—R<sup>1</sup> small, sometimes absent; cell-bars partly vestigial; median and submedian bars R<sup>3</sup>—M<sup>2</sup> represented by black spots, median bar M<sup>1</sup>—M<sup>2</sup> often vestigial only.—Hindwing: orange red area paler at costal margin, its

outer edge nearly straight, crossing M a little beyond  $M^1$ ; a series of submarginal dots from  $R^2$ — $SM^2$ , two in each cellule, the upper ones (often obsolete or absent) orange red, the posterior ones white, the series enrvd, nearly parallel to outer margin; admarginal  $SC^2$ — $M^1$  present, orange red, spot  $R^1$ — $R^2$  the largest, spots  $R^2$ — $M^1$  often minute, spot  $M^1$ — $M^2$  seldom vestigial, placed near tip of tail, creamy buff, spots  $M^2$ —( $SM^1$ ) and ( $SM^1$ )— $SM^2$  yellow, mostly fused together, much smaller than spot  $R^1$ — $R^2$ ; wing strongly rounded anteriorly, concave from  $R^3$ — $M^2$ , produced into a blunt tail at  $M^2$ , dentate at  $R^3$  and  $M^1$ , anal angle more produced than in *etesipe*.

*Underside*.—Forewing: internal area up to  $M^1$  reddish orange, this colour entering cell; rest of wing very pale olive buff, with the veins and folds and the outer margin drab; basal cell-spot and cell-bar 2 fused together to a round spot, which has a similar spot in front before C, cell-bar 3 separated into two, cell-bar 4 into three round spots, the latter standing in a triangle, the most distal spot smallest; bar D very heavy, measuring  $2\frac{1}{2}$  to 3 mm. in width in middle: submedian bar  $M^2$ —( $SM^1$ ) sometimes indicated by a dot below base of  $M^2$ , submedian and median bars  $R^3$ — $M^2$  oblong spots, which do not always touch the veins, median bar  $R^3$ — $M^1$  more distal than bar  $M^1$ — $M^2$ , 6 mm. from base of  $M^1$ , all these spots black, no median bar  $R^2$ — $R^3$ , median bars  $SC^3$ — $R^2$  fused together to a triangular, blackish drab, mark, pointing posticad, 8 mm. from upper angle of cell at  $SC^5$ ; discal bars  $SC^3$ — $R^3$  fused together to a drab line, which is ill-defined, stands midway between median triangular costal patch and apex of wing, is slightly curved, and is prolonged to  $M^2$  by the black, partly obsolete, bars  $R^3$ — $M^2$ , which are somewhat heavier upon veins; postdiscal bars  $M^1$ — $SM^2$  represented by large black patches, bar  $R^3$ — $M^1$  sometimes vestigial, internal margin black at angle of wing.—Hindwing: bars black; costal area from base to beyond middle, posteriorly limited by  $SC^2$  or  $R^1$ , creamy buff, here and there pinkish; two spots, one at base of C, the other at angle of PC, representing the basal costal bar; submedian and median costal bars also developed to large round spots, submedian and median bars C— $SC^2$  represented by smaller round spots, more distal, median bar  $R^1$ — $R^2$  also a round spot; basal cell-bar joined at M to cell-bar 2 forming a ring which opens costad, cell-bar 4 joined near upper end to cell-bar 2, curved as in *etesipe*, posterior part very heavy, sending out a branch to bar D; median bars  $R^2$ — $M^2$  all joined to, or fused with, bar D at base of  $R^3$ , median bar  $M^1$ — $M^2$  about 3 to 4 mm. from base of  $M^2$ , median bar  $M^2$ — $SM^3$  fused to a heavy oblique band, 8 mm. from base of  $M^2$ , crossing  $SM^3$  several mm. proximally of its end; submedian and subbasal abdominal bars forming similar bands, extending to abdominal edge of wing, all these bars connected with one another by heavy longitudinal lines upon veins and internervular folds, the veins and internervular folds also more or less black between median and submarginal bars, but no internervular lines between median and discal bars C— $R^1$ ; discal bar C— $SC^2$  6 mm. from tip of C, bar  $R^1$ — $R^2$  7 mm. from tip of  $R^2$ , somewhat luniform, triangularly dilated basad, bars C— $R^2$  fused together as are bars  $M^1$ — $SM^3$ , but discal bars  $R^2$ — $M^1$  more isolated, represented by long triangular dashes; postdiscal series of bars similar to discal series, but dilated distad upon internervular folds, bars  $R^2$ — $M^1$  luniform, bars  $M^1$ — $SM^2$  very heavy, fused with the submarginal bars, postdiscal interspaces C— $M^1$  more or less rufous red, the upper one the smallest, spots  $R^1$ — $M^2$  halfmoon-shaped, interspaces  $M^1$ — $SM^2$  filled up by two yellow spots, the second twice as large as the first, both narrower than interspaces  $R^1$ — $M^1$ ;

submarginal bar  $C-SC^2$  somewhat curved, bars  $SC^2-R^2$  straight, bars  $R^2-M^1$  much more distal, the series being broken at  $R^2$  as in *etesipe*, slightly curved distad, bars  $M^1-M^2$  fused with the postdiscal bar and the marginal line to a large patch with which is also fused the large patch formed by the postdiscal and submedian bars  $M^2-SM^2$ ; submarginal interspaces within this black patch represented by small bluish white dots, submarginal interspaces  $C-R^2$  drab, divided at folds, followed by two more whitish ones, also divided; marginal line black, not interrupted; admarginal interspaces  $C-R^2$  rather large, rufous red, interspace  $R^2-R^3$  narrower, constricted or interrupted, the next still narrower, often obsolete, represented generally by a rufous red and an olive buff dot, no admarginal interspace  $M^1-M^2$ , while interspace  $M^2-SM^2$  is represented by a large pale yellow spot; subbasal to discal interspaces in posterior half of wing pale buff, becoming almost white towards base.

♀. Body above ochraceous, thorax slightly olivaceous, head and palpi and pronotum black, spots as in ♂, anterior tarsus pale ochraceous.

*Wings above* with a large orange area, which becomes slightly reddish in cell of forewing, this area larger than in ♂.—Forewing: apex blunt, outer margin faintly concave in middle, internal angle rounded; cell all reddish orange, with the dots of the underside all marked, but partly only vestigial; broad bar D also mostly isolated, the orange colour penetrating outside bar D to  $SC^{4-5}$ ; heavy median bars  $SC^3-R^2$  at least vestigial, median bar  $R^2-R^3$  represented by a black dot, which is absent from underside, median bar  $R^3-M^1$  a conspicuous dot, a little more distal than in ♂; submedian and median dots  $M^1-M^2$  vestigial; the black outer area about 10 mm. at  $SM^2$ , narrowing costad, of nearly equal width from  $SC^5$  or  $R^1$  to  $R^3$ ; cellules  $R^1$  to costal margin black, except postdiscal spot  $SC^5-R^1$  (which has sometimes a distinct spot in front); the discal bars are sometimes clearly marked, angle-shaped or linniform, black or rufous red, separating a series of spots from the orange area, of which spots  $M^1-SM^2$  are generally small; veins black near outer area.—Hindwing: outline nearly as in ♂, anteriorly less rounded, the wing produced into a lappet from  $M^1$  to ( $SM^1$ ), this lappet divided by an incision at fold  $M^1-M^2$  into a smaller and slightly longer, rounded, anterior, and a broader, obliquely rounded, posterior portion; orange or pale orange area wider than in ♂, extending 3 to 5 mm. beyond apex of cell, its outer edge irregular; bar D and median bar  $R^2-R^3$  often marked, also sometimes median bars  $SC^3-R^2$ , while the other bars in the basal half generally shine through from the underside; outer half of wing not so deep black as in ♂, with three series of markings: a series of small postdiscal spots, reddish orange, the posterior ones paler, the upper ones often obsolete, a series of submarginal dots, the series broken at  $R^2$  and again at  $M^1$ , the upper portion often obsolete, orange, the second portion of 4 dots rather heavy, orange, the last of the 4 whitish, and the third portion (still more distal) white; an admarginal series consisting of spots  $C-R^3$  which are complete, spot  $R^1-R^2$  large, orange, and of spots  $R^3-SM^2$  which are yellow, spot  $R^3-M^1$  interrupted, spot  $M^2-SM^1$  also interrupted, the upper portion generally absent, or at least minute, the second portion a rounded or ovate patch, spots  $M^2-SM^2$  often fused to a narrow line.

*Underside* appearing somewhat paler than in ♂, the bars being on the whole not so heavy, and consequently the pale interspaces larger.

Length of forewing: ♂, 34—38 mm.

„ „ ♀, 41—45 mm.



Length of SC<sup>2</sup> of hindwing (from base) : ♂, 23 mm ; ♀, 30 mm.

„ M + M<sup>2</sup> „ „ ♂, 27 mm ; ♀, 33 mm.

Clasper more complicated than in the allied species, the dorsal margin produced mesiad into a tooth which is deeply grooved on the upperside, apex of clasper beyond this tooth broad, then narrowed into a hook ; ventral edge of clasper armed on the inner side with a tooth which points distad (Pl. VIII. f. 30, subdorsal view) ; penis-funnel long, very slender, apical third convex above, almost rod-like, end curved downwards, forming a hook ; penis thick, apex compressed, a short denticulated dorsal ridge before the end ; tenth abdominal tergite with two processes.

*Hab.* West Africa, from Sierra Leone to the Upper Congo. In the Tring Museum 22 ♂♂, 11 ♀♀, from : S. Leone, Pt. Lokkoh, Suza country, vii. '99 (Capt. Stevens) ; Sherboro ; Accra ; Warri, Niger, 4. v. '76 (Dr. Roth) ; Stanley Pool to Lnkolele, and Bopoto, Congo ; Great Forest on Upper Congo, three days' march from Ft. Beni, 7. v. '99 (Dr. Ausorge).

This species has been separated generically from *Charaxes* on account of the outline of the hindwing. The absence of tail R<sup>3</sup> and the shortness of tail M<sup>2</sup> give the insect a peculiar appearance, but do no more justify a generic separation from *Charaxes*, than the difference in the outline of the wings does in the case of *varanes*, *mycerina*, etc. In our opinion *Ch. zingha* is closer related to *Ch. etesipe* than this is to *Ch. jasius*, *candiope*, *polyxena*, etc. It is in colour of an acraeoid appearance.

*h*<sup>1</sup>. Cell-bar 4 of forewing below not separated into rounded spots.

*i*<sup>2</sup>. Bars of underside chestnut tawny with black or brown borders, heavy.

*m*<sup>3</sup>. Discal and postdiscal bars of hindwing below not regularly arched.

*m*<sup>4</sup>. Band of upperside of hindwing distal of middle of wing in ♂.

#### 64. *Charaxes etesipe*.

♀. *Papilio Nymphalis Phaleratus etheocles*, Drury (non Cramer, 1777), *Illustr. Es. Ins.* III. p. 12. t. 10. f. 1. 2. and Index (1782) (S. Leone) ; Fabr., *Ent. Syst.* III. 1. p. 64. n. 200 (1793) (pt.).

♀. *Nymphalis etesipe* Godart, *Enc. Méth.* IX. p. 335. n. 19 (1823) (S. Leone).

♂. *Nymphalis etheta* Godart, l.c. p. 356. n. 20 (1823) (Afr. occ. ; ♂ of *etesipe* ?).

♂. *Body above* olivaceous black, head, pronotum and anterior portion of mesonotum bistre ; dots on head and pronotum and line behind eye prominent, mesial dot of pronotum mostly concealed by the hair-like scaling ; *underside* cream colour, palpi white, stripes on sterna underneath legs, posterior part of metasternum and upperside of anterior tibia and tarsus brown or black, four posterior femora black on upperside, with dispersed white scales.

*Wings above*, blackish blue, glossy blue in side-light, more glossy towards base, with a greenish tint.—Forewing : outer margin generally obviously denticulate ; a spot in upper angle of cell and a series of five discal spots SC<sup>5</sup>—M<sup>1</sup> white, mostly edged with blue, spot R<sup>2</sup>—R<sup>3</sup> minute or absent, close to cell, spot R<sup>1</sup>—R<sup>2</sup> also small, the other three about 1 to 1½ mm. in diameter, no discal spots from M<sup>2</sup> to internal margin ; a complete postdiscal series of spots, the posterior ones the largest, often developed to large patches, pale blue, the upper four or five small, more or less white, generally blue at edges, spot R<sup>1</sup>—R<sup>2</sup> the smallest, the series parallel to outer margin, curving costad in front ; a complete series of admarginal spots, pale blue, whitish upon internervular folds.—Hindwing : a postdiscal series of pale blue spots, the series somewhat angled before R<sup>3</sup>, in some forms the spots dilated basad to the apex of the cell and fused together, the upper ones

mostly excepted, representing a broad disco-postdiscal band, bar D and median bars C—R<sup>2</sup> sometimes vestigial, a white discal patch C—SC<sup>2</sup> either isolated or joined to the respective blue postdiscal spot; submarginal dots white, mostly blue at edges, spot R<sup>1</sup>—R<sup>2</sup> small, sometimes vestigial; admarginal spots R<sup>2</sup>—M<sup>2</sup> generally continuous, feebly interrupted by the black veins, extending far into tails, pale blue, mostly white at veins, spots SC<sup>2</sup>—R<sup>2</sup> rufous red, heavy, or vestigial, or absent; anal spot buffish: the submarginal and admarginal series broken at R<sup>2</sup> owing to the wing being suddenly dilated at R<sup>2</sup>; a white and pale blue patch at abdominal margin near anal angle.

*Underside* variegated with cream colour and drab; basal to median bars rufous red, edged with black.—Forewing: markings in cell and submedian and median bars heavy; basal cell-spot present, with a costal spot in front; bar 3 more or less rounded, bar 4 strongly angled, interspaces more or less creamy white; submedian bar M<sup>1</sup>—M<sup>2</sup> before base of M<sup>1</sup>, more distal than bar M<sup>2</sup>—(SM<sup>1</sup>), the latter extended black, often joined to respective discal one, no submedian bar R<sup>3</sup>—M<sup>1</sup>; discal bars M<sup>1</sup>—(SM<sup>1</sup>) continuous or nearly so, bar R<sup>3</sup>—M<sup>1</sup> more distal, about 4 mm. from base of M<sup>1</sup>, somewhat luniform as a rule, bar R<sup>2</sup>—R<sup>3</sup> more proximal, bar R<sup>1</sup>—R<sup>2</sup> more distal than bars SC<sup>3</sup>—R<sup>1</sup>, these latter fused to one marking, median bars with milky white patches at outer side; discal bars black, standing in a slightly curved series, bar M<sup>2</sup>—(SM<sup>1</sup>) sometimes touching median bar, bars SC<sup>4</sup>—M<sup>1</sup> short, more like spots than bars, not luniform, all at outside with milky, or creamy, white patches—posterior ones externally shaded with rufous in some individuals—which are well separated from one another and reach to the postdiscal black bars, which stand in a series about parallel to outer margin, the posterior bars patch-like, the middle ones represented by rather small spots, the upper two larger again, especially patch SC<sup>4</sup>—SC<sup>5</sup>, which has often a rufous red centre; submarginal bars thin, forming a blackish drab line which is more or less interrupted at veins, very widely so at R<sup>3</sup>, edge of wing thinly blackish drab, admarginal interspaces with white or creamy patches between veins, patches SC<sup>3</sup>—SC<sup>4</sup> and R<sup>1</sup>—R<sup>2</sup> small.—Hindwing: basal costal bar represented by a brown spot, PC edged with blackish brown, costal submedian, median and discal bars wanting, the costal area up to postdiscal bar creamy white; subbasal to discal bars C—SC<sup>2</sup>, cell-bar 2 and upper portion of cell-bar 4, as well as median and discal bars SC<sup>2</sup>—R<sup>1</sup>, heavy; subbasal to median bars C—SC<sup>2</sup> close together; bar D thin; basal cell-spot black, veins SM<sup>2</sup>, SM<sup>3</sup>, and (SM<sup>1</sup>) more or less black, a line between these veins and sometimes one beyond SM<sup>3</sup> also black; median bars M<sup>2</sup>—SM<sup>2</sup> zigzag; discal and postdiscal bars black, parallel, bars R<sup>2</sup>—R<sup>3</sup> more distal than bars R<sup>1</sup>—R<sup>2</sup> and R<sup>3</sup>—M<sup>1</sup>, postdiscal bars R<sup>3</sup>—SM<sup>2</sup> arched, the respective discal ones not or only slightly arched; submedian white spots prominent, submedian interspaces drab, this colour extending between C and R<sup>2</sup> to discal bars or more basal; blackish brown submarginal bars C—R<sup>2</sup> straight, bars R<sup>2</sup>—M<sup>1</sup> enlarged, black, bars M<sup>1</sup>—SM<sup>2</sup> much shaded with blue; admarginal spots C—R<sup>2</sup> rufous red, bordered all round with white, transverse, upper one triangular, spot R<sup>2</sup>—R<sup>3</sup> olive buff, small, often very thin, spots R<sup>3</sup>—M<sup>2</sup> larger, more or less yellow, not interrupted at M<sup>1</sup>, anal spot olive buff; tails slender, long.

♀. *Body above*, less black than in ♂, bistre brown; *underside* as in ♂, but abdomen brown, with buffish or whitish edges to the segments; anterior tarsi white.

*Wings, upperside*: purple black, with a slight bluish gloss, which is stronger and more greenish in basal area.—Forewing: the markings creamy white, or from M<sup>2</sup> to costal margin pale tawny ochraceous; discal spots as in ♂, but smaller,

spots  $R^3-M^2$  either separate or fused with the postdiscal patches, in which case bars  $R^3-M^2$  are vestigial; postdiscal spots always large, except upper three, about 6 to 8 mm. wide at  $SM^2$ , the series oblique; no distinct admarginal spots.—Hindwing: a mediano-discal band from costal to abdominal margin, white, straight, at right angles to  $R^1$ , narrowest between  $SC^2$  and  $R^1$ , much shaded with olive buff or blue (except in front), bordered with that colour at both sides; submarginal white spots as in ♂, sometimes obsolete, except the last ones; admarginal spots less conspicuous than in ♂, often more or less obsolete.

*Underside*: similar to that of ♂, disco-postdiscal creamy or milky white patch of forewing large, no discal bar  $M^2-(SM^1)$ ; tails less pointed, sometimes slightly spatulate.

Length of forewing: ♂, 34—41 mm.

" " ♀, 39—45 mm.

Tenth tergite of abdomen (♂) rounded; clasper essentially as in *Ch. achaemenes*; penis-funnel shorter than in that species, otherwise similar in shape; penis with a triangular ridge about 3 mm. before end, similar to that of *Ch. etheoetes*, but dorso-lateral; the size and outline of the ridge is variable; there are often some small teeth before the ridge.

*Hab.* Tropical West and East Africa, and Madagascar.

The geographical representative forms which we unite here under one species are constantly and conspicuously different in the width of the postdiscal band across the upperside and in some other details; the East African *taretensis* stands exactly intermediate between the West African *etesipe* and the Malagassic *cacuthis*, while *abyssinicus* connects *taretensis* with *etesipe*.

#### a. *Ch. etesipe cacuthis*.

*Charaxes cacuthis* Hewitson, *Exot. Butt.* III. *Charaxes*. t. 3. f. 12. ♀. 13. ♂ (1863) (Madagascar); Butl., *Proc. Zool. Soc. Lond.* p. 629. n. 26 (1865) (Madag.); Saalm., *Lep. Madag.* p. 88. n. 127 (1884); Mab., in Grandid., *Hist. Nat. Madagasc.*, Lép. I. p. 185. n. 4. t. 22. f. 1. 2. 3 (1885-87) (E. and N.E. Madag.; Nossibé); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 399. n. 145 (1896) (Madag.); Auriv., *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 234. n. 15 (1899) (Madag.).  
*Nymphalis cacuthis*, Kirby, *Cut. Diurn. Lep.* p. 269. n. 25 (1871) (Madag.).  
♀. *Charaxes antanala* Lucas, *Ann. Sc. Nat.* (5). XV. no. 22. p. 1 (1872) (Madag.).

♂. *Wings above*, band broad.—Forewing: rather more elongate than in *etesipe etesipe*, outer edge denticulate, postdiscal band 7 to 10 mm. wide behind  $SM^2$ ,  $5\frac{1}{2}$  mm. behind  $M^2$ ; white discal spot  $M^1-M^2$  touching or almost touching postdiscal patch; admarginal spots small, last two seldom fused.—Hindwing: white costal patch  $C-SC^2$  contiguous with blue postdiscal one, blue patch  $SC^2-R^1$  about 6 mm. long, band not interrupted from  $R^1$  to  $(SM^1)$ , broader from  $R^1$  to  $M^2$  than black outer area, outwardly concave between veins  $R^3-SM^2$ , crossing  $M$  between bases of  $M^1$  and  $M^2$ , generally two white spots  $SC^2-R^2$  marked within band close to its proximal edge; admarginal, rufous red, spots  $SC^2-R^2$  present as a rule, but often obsolete.

*Underside*: white colour somewhat more extended than in the other two races.—Forewing: submarginal bars  $R^2-M^1$  present, discal bars  $M^2-SM^2$  close to median bars.

♀. *Wings above*.—Forewing: markings from  $M^2$  to costal margin pale tawny ochraceous or whitish ochreous buff; discal spots  $R^3-M^2$  fused with the postdiscal ones, respective median bars vestigial within the patches thus formed, postdiscal and discal spots  $R^2-R^3$  joined together by means of chestnut scaling which extends

sometimes to apex of cell, spots  $R^1$ — $R^2$  sometimes joined together in the same way. —Hindwing: band bordered with blue, the blue scaling extending basad beyond base of  $M^2$ ; submarginal dots  $C$ — $R^2$  obsolete as a rule; admarginal spots  $SC^2$ — $R^2$  vestigial.

*Underside*.—Forewing: outer half of cellules  $R^2$ — $M^1$  for the greater part drab, the submarginal bars present.—Hindwing: postdiscal bars and white submarginal spots somewhat wider apart than in the continental forms.

Length of forewing: ♂, 34—38 mm.

" " ♀, 39—42 mm.

*Hab.* Madagascar. In the Tring Museum 11 ♂♂, 2 ♀♀: Antonambé, baie d'Antongil, iii. iv. '98 (A. Mocquerys); Antanosy country.

#### b. *Ch. etesipe tavetensis* (Nov. Zool. V. t. 5. f. 4. ♂).

*Charaxes tavetensis* Rothschild, *Nov. Zool.* I. p. 535. n. (1894) (Taveta); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 399. n. 146 (1896); Auriv., *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 234. n. 14 (1899).

*Charaxes cacuthis*, Lantz (non Hewitson, 1863), *Iris* IX. p. 142 (1896) (Parumbira, X.).

♂. *Wings above*: as in *cacuthis*, but posterior postdiscal patches of forewing narrower, patch  $M^2$ — $SM^2$  measuring 4 mm. at the widest point, discal spots  $R^3$ — $M^2$  widely separated from postdiscal ones as in *etesipe*.—Hindwing: postdiscal blue patches  $C$ — $R^2$  much smaller than in *cacuthis*, separated from one another, the upper ones not entirely contiguous with white discal patch, no white discal spots  $SC^2$ — $R^2$ , black outer area wider from  $R^2$  to  $SM^2$  than in both *etesipe* and *cacuthis*; white submarginal dots all present, but dot  $R^1$ — $R^2$  minute as a rule; admarginal spots  $SC^2$ — $R^2$  obsolete.

*Underside*: as in *etesipe*, the creamy white discal spots of the hindwing larger on the whole.

♀. *Wings above*.—Forewing: markings creamy white; discal spots  $R^3$ — $M^2$  fused with the postdiscal ones to ovate patches, bars within these patches vestigial.—Hindwing: band bordered and shaded over with olive buff; rufous red admarginal spots  $SC^2$ — $R^2$  at least vestigial, bluish grey admarginal spots  $R^2$ — $M^2$  present.

*Underside*: somewhat more extended drab than in *cacuthis*.—Forewing: cellules  $R^2$ — $M^1$  white for the greater part from discal bars to outer margin, discal bars  $R^3$ — $M^2$  obsolescent.

Length of forewing: ♂, 35—41 mm.

" " ♀, 42 mm.

*Hab.* East Africa. In the Tring Museum 3 ♂♂ from: Taveta, July 1891 (*type*); Dar-es-Salaam; Zomba, Nyassaland, xii. 1895 (Dr. Perey Rendall). 2 ♀♀ in the Berlin Museum from Dar-es-Salaam.

The Zomba example has the blue postdiscal patches of the forewing above more proximal than the other specimens, the patches being the same in position as in *cacuthis*, and the band of the hindwing is also more proximal.

#### c. *Ch. etesipe abyssinicus* Rothsch. subsp. nov.

*Charaxes etesipe*, Oberthür (non Godart, 1823), *Ann. Mus. Civ. Genova* XV. p. 165. n. 44. (1879) (Let Marefia, Shoa, Aug. '77); id., *l.c.* XVIII. p. 727. n. 55 (1883) (Felek, XII., Sciotalit, I. IV.); Auriv., *l.c.* (pt.).

♂. Differs from *Ch. etesipe tavetensis* as follows: *Upperside*, forewing, postdiscal patch  $M^2$ — $SM^2$  larger, patch at internal margin extended to angle of wing;



admarginal spots larger, spots  $M^2-SM^2$  merged together to one spot, which is somewhat 3-shaped and touches the veins.—Hindwing: pale blue band of more even width, being narrower behind, and broader in front than in *taretensis*, patch  $SC^2-R^1$  measuring nearly 5 mm. in length, while patch  $R^3-M^1$  is very little over 5 mm. long.

*Underside*: ground colour more cinnamon, the white patches as well as the red bars near the end of the cell of the hindwing much less distinct.

♀. Unknown.

In the form of the band of the hindwing intermediate between *Ch. etesipe taretensis* and *Ch. etesipe etesipe*.

Length of forewing: ♂, 40 mm.

*Hab.* Abyssinia: Sciotalit, Scioa (Shoa), 23. i. '80 (Antinori), 1 ♂.

#### d. *Ch. etesipe etesipe*.

*Papilio Nymphalis Plateratus theocles*, Drury (non Cramer, 1777), *l.c.*; Fabr., *l.c.*

(?). *Papilio Eques Achivus theocles*, Herbst, *Naturs. Schm.* IV. p. 71. n. 157. t. 65. f. 5 (1790) (pt.).

♀. *Nymphalis etesipe* Godart, *l.c.*; Doubl., Westw. & Hew., *Gen. Diurn.* II. p. 308. n. 9 (1850).

♂. *Nymphalis etheta* Godart, *l.c.*; Guér., *Icon. Règne An.* t. 78. f. 4 (1829) & p. 477 (1844); Griffith, *Anim. Kingdom, Ins.* t. 2. f. 4 (1832); Doubl., Westw. & Hew., *l.c.* n. 10 (1850).

♀. *Charaxes etesipe*, Butler, *Proc. Zool. Soc. Lond.* p. 629. n. 25 (1865) (S. Leone).

♂. *Charaxes etheta*, Butler, *l.c.* n. 27.

♀. *Charaxes theocles*, Butler, *Cat. Diurn. Lep. descr. by Fabr.* p. 52. n. 9 (1869) (pt.).

♂ ♀. *Charaxes etesipe*, Butler, *Tr. Ent. Soc. Lond.* p. 273. t. 5. f. 6, ♂ (1869) (*etheta* = ♂ of *etesipe*); Mab., in Grandid., *Hist. Madag.*, *Lép.* I. p. 189. n. 8 (1885-87) (Madagascar *ex err.!*); Dewitz, *Nov. Act. Leop. Car. Ak. Naturf. L.* 4. p. 371 (1887) (Mukenge, IV. VIII.); Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 146. n. 80 (1890) (Gaboos); Smith, *Proc. Zool. Soc. Lond.* p. 472. n. 87 (1890) (Aruwimi); Godm. & Salv., in Jameson, *Story of Rear Column* p. 440. n. 81 (1890) (Aruwimi); Upper Congo; Auriv., *Ent. Tidskr.* XII. p. 215. n. 140 (1891) (Cameroons; Gaboon); id., *l.c.* XV. p. 311. n. 196 (1894) (Cameroons, IV. XI.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 399. n. 147 (1896) (S. Leone; Accra; O. Calabar; Isubu; Cameroons); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 234. n. 13 (1899) (S. Leone to Angola and Aruwimi; Abyssinia and Madagascar *loc. err.*).

♂ ♀. *Nymphalis etesipe*, Kirby, *Cat. Diurn. Lep.* p. 269. n. 24 (1871) (Afr. occ.); Dewitz, *Nov. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 29 (1879) (N. Angola).

♂. *Wings* shorter and broader than in the other races; *above* with postdiscal macular bands narrow.—Forewing: discal spot  $M^1-M^2$  nearer to cell than to postdiscal spot; postdiscal spot  $M^2-SM^2$  proximally incised, distally produced into a short line upon ( $SM^1$ ), somewhat shaped like figure 3, about half as wide again transversely as in basi-distal direction, spot  $M^1-M^2$  convex proximally, somewhat concave distally, diameter about  $1\frac{1}{2}$  mm., spot at internal margin very variable in length; posterior admarginal spots rather heavier than in the other races.—Hindwing: postdiscal spots nearly equal in width, spot  $C-SC^2$  often small, sometimes obsolete, spots  $R^3-SM^2$  distinctly halfmoon-shaped, all separated from one another, the last ones, however, mostly touching each other.

*Underside* more extended drab than in *cacuthis*.—Forewing: discal bars  $M^1-SM^2$  widely separated from median ones; cellule  $M^2-SM^2$  much shaded with black, with scarcely any or with few white scales at outer side of median bar, the discal bar  $M^2-SM^2$  very heavy, as in *taretensis*; cellules  $R^2-M^1$  with a large creamy patch, the submarginal bars more or less obliterated.—Hindwing: discal bars  $R^3-M^2$  very short.

♀. *Wings, above*: markings varying individually from white to creamy buff.—Forewing: spots smaller than in *taretensis*, discal spots  $R^3-M^2$  as a rule

separate from postdiscal ones, seldom close to them, or, if fused with them, very small.—Hindwing: admarginal line  $R^2-M^2$  obsolete or very thin and interrupted; white submarginal dots  $C-R^2$  more or less obsolete in the specimens from Sierra Leone to Gold Coast.

Length of forewing: ♂, 35–40 mm.

“ “ ♀, 41–45 mm.

*Hab.* West Africa, from Sierra Leone to Angola and Unyoro. In the Tring Museum 36 ♂♂, 11 ♀♀ from: Sierra Leone; Kumassi to Mansu, iv. '99 (Northcott); Mamfi, Accra, Begoro; Warri, 20. ix. '97 (Dr. Roth); Cameroons; Great Forest of Upper Congo, two and three days' march from Ft. Beni, 6. v. & 7. v. '99 (Dr. Anson); Congo; Kassai; Wakibara, Unyoro, 23. vii. '97, Warringo R., Unyoro, 8. vii. '97, Fajao, Unyoro, 10. xii. '97 (Dr. Anson).

Dr. Roth caught a ♀ at night at a lamp (!) at Warri, Niger Coast Protectorate. Pl. V. of Nov. Zool. V. represents a curious aberration from Sierra Leone.

$n^4$ . ♂ with band of hindwing above in middle.

#### 65. *Charaxes penricei* Rothsch., sp. nov.

♂. Body as in *Ch. etesipe*.

*Wings, upperside*, bluish black, somewhat metallic green towards base.—Forewing: markings similar in position to those of *Ch. etesipe cacuthis*, all white, the posterior patches slightly edged with blue, postdiscal spots  $SC^4-R^3$  larger than in *cacuthis*, patch  $M^2-SM^2$  6 mm. wide, more proximal than in *cacuthis*, being 9 mm. distant from end of  $SM^2$ .—Hindwing: a band across the wing as in the ♀ *etesipe*, but the band is blue for the greater part, the white colour being restricted to spots which correspond to the white spots of the underside, externally the band is incised upon the veins, point of origin of  $M^1$  about in middle of band; median bar  $C-SC^2$  and bar D appear as black lines within the band; submarginal and admarginal spots essentially as in *etesipe etesipe*.

*Underside* nearly as in *etesipe* ♂, but the white markings larger and purer in colour, the red bars brighter.—Forewing: black discal bars  $R^2-SM^2$  placed as in *etesipe* ♀, being much more proximal than in *etesipe* ♂, discal bar  $M^2-SM^2$  not clearly separated from the respective median one, white postdiscal interspace  $M^2-SM^2$   $3\frac{1}{2}$  mm. broad at  $M^2$ , and 5 mm. at  $SM^2$ , black postdiscal patch  $M^2-SM^2$  larger than in *etesipe* ♀.—Hindwing: rufous red postdiscal spots  $C-R^2$  very conspicuous, the following postdiscal interspaces also more or less rufous red, median and submedian bars  $M^2-(SM^1)$  closer together than in *etesipe*.

Length of forewing: ♂, 38 mm.

Genital armature not essentially different from that of *Ch. etesipe*.

*Hab.* Quebe R., Angola (Penrice), 1 ♂.

This curious species resembles much more the ♀ of *Ch. etesipe* than the ♂ on the upperside of the hindwing, while on the forewing the pattern recalls that of *Ch. etesipe cacuthis* from Madagascar.

$n^3$ . Discal and postdiscal bars of hindwing below regularly arched, forming halfmoons together.

#### 66. *Charaxes achaemenes* (Nov. Zool. VII. t. 12 f. 1. ♀).

*Charaxes jocaste* Doubleday, *List. Spec. Lep. Ins. Brit. Mus.* I. Append. p. 28 (1844) (*nom. nud.*); Butl., *Proc. Zool. Soc. Lond.* p. 628, n. 21 (1865) (*nom. nud.*; Senegal); id., *Tr. Ent. Soc. Lond.*

p. 274 (1869) (*achaemenes* = *jocaste*); id., *Ann. Mag. N. H.* (4). XVIII. p. 481 (1876) (Atbara); id., *l.c.* (6). VII. p. 42. n. 11 (1891) (Kandera, X.); id., *Proc. Zool. Soc. Lond.* p. 648. n. 17 (1893) (Zomba, VII.).

*Nymphalis jocaste* Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 17 (1850) (*nom. nud*; Senegal).

*Charaxes achaemenes* Felder, *Reise Novara, Lep.* p. 446. n. 729. t. 59. f. 6. 7 (1867) (Natal); Butl., *Tr. Ent. Soc. Lond.* p. 121. n. 20 (1870) (= ♂ of *jocaste*); Obertb., *Ann. Mus. Civ. Genova* XVIII. p. 727. n. 56 (1883) (Shoa, August); Trim. & Bowk., *S. Afr. Butt.* I. p. 340. n. 113 (1887) (Natal; Del. Bay; Bechuanaland); Mab., *Ann. Soc. Ent. Fr.* p. 23 (1890) (Assinie); Trim., *Proc. Zool. Soc. Lond.* p. 80. n. 35 (1891) (S.W. Afr.; Omrora, VIII.; Ehanda, IX.); Monteiro, *Delagoa Bay* t. 1. f. 2 (1891); Trim., *l.c.* p. 41. n. 65. t. 5. f. 7. ♀ (1894) (Manica); Carpent., *Proc. Roy. Dublin Soc.* (2). VIII. (1895) (Lokoja); Butl., *Proc. Zool. Soc. Lond.* p. 256. n. 18 (1895) (Zomba); id., *Journ. Linn. Soc. Lond.* XXV. p. 356. n. 15 (1896) (Senegal; Atbara; Kandera; Zomba; Zambesi; Del. Bay); id., *Proc. Zool. Soc. Lond.* p. 822. n. 11. (1896) (Deep Bay, Nyassa, III.); id., *l.c.* p. 852. n. 11 (1896) (Nyassa); Lanz, *Iris* IX. p. 142. (1896) (Tanganyika); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 234. n. 16 (1899) (Senegal; Ivory Coast; Lokoja; Angola; S.W. Africa; Bechuanaland; Natal to the Tanganyika, Somaliland and Abyssinia).

*Nymphalis achaemenes*, Kirby, *Cat. Diurn. Lep.* p. 269. n. 20 (1871); Dewitz, *Nor. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 28 (1879) (Angola).

♂. *Body above* olive drab, head and pronotum nearly walnut brown, abdomen drab colour; white dots on head and line behind eye conspicuous; *underside* creamy white, with brown oblique streaks on breast underneath femora, anterior tibia brown in front.

*Wings above* olive black, bistre colour towards base; markings white.—*Forewing*: elongate as in *Ch. fabius fabius*; cell mostly with an obscure spot in upper angle; a discal band of four patches from R<sup>3</sup> to internal margin, oblique, patch M<sup>2</sup>—SM<sup>2</sup> 5 mm. broad at SM<sup>2</sup>, patches R<sup>3</sup>—M<sup>2</sup> mostly somewhat narrower, separated, convex proximally, somewhat concave distally, especially patch R<sup>3</sup>—M<sup>1</sup>, this band preceded by three discal spots; spot R<sup>2</sup>—R<sup>3</sup> close to cell, small, the other two, SC<sup>5</sup>—R<sup>2</sup>, at about  $\frac{1}{3}$  the way from cell to apex of wing; an oblique postdiscal series of spots from SC<sup>4</sup> to M<sup>2</sup>, decreasing in size posticad, the upper one  $1\frac{1}{2}$  to  $2\frac{1}{2}$  mm. wide, spots R<sup>3</sup>—M<sup>2</sup> close to discal patches, with which they are sometimes completely fused; a series of admarginal elongate dots from SC<sup>4</sup>—SM<sup>2</sup>, standing upon the internervular folds, the spots of about the same size throughout.—*Hindwing*: a discal band from costal margin to abdominal fold as prolongation of the band of the forewing,  $4\frac{1}{2}$  mm. broad at SC<sup>2</sup>, generally widened basad in cell, its outer edge nearly straight, crossing M at, or a little beyond, origin of M<sup>1</sup>; a complete series of submarginal dots, all prominent, more or less heavily shaded with glaucous blue; admarginal spots linear, glaucous blue, somewhat white at veins as a rule, extending into tails, spots R<sup>1</sup>—R<sup>3</sup> thin, SC<sup>2</sup>—R<sup>1</sup> absent or vestigial, C—SC<sup>2</sup> absent, anal one more or less yellow, wing suddenly widened from R<sup>2</sup> to SM<sup>2</sup>, hence the admarginal and submarginal series of spots broken at R<sup>2</sup> (which is especially evident on underside); abdominal fold grey in middle, especially near SM<sup>3</sup>, with an ill-defined white patch before anal angle.

*Underside*: greyish white, variegated with drab colour; basal to median bars rufous chestnut, edged with black, except thin bars SC<sup>2</sup>—SM<sup>3</sup> of hindwing, which have the black edges seldom vestigial.—*Forewing*: basal cell-spot present, cell-bar 3 represented by a spot behind SC, bar 4 very oblique, curved costad, somewhat comma-shaped, but of nearly the same thickness throughout, closer to M<sup>2</sup> than M<sup>1</sup>; bar D somewhat dilated costally; submedian and median bars about at right angles to veins, interspaces M<sup>1</sup>—(SM<sup>1</sup>) of about the same width, bars M<sup>1</sup>—M<sup>2</sup> more distal



than bars  $M^2-(SM^1)$ , no submedian bar  $R^3-M^1$ , median bar  $R^3-M^1$  1 to  $1\frac{1}{2}$  mm. more distal than median bar  $M^1-M^2$ , 3 mm. from base of  $M^1$ , slightly curved, bar  $R^2-R^3$  a little more proximal, bars  $SC^3-R^1$   $6\frac{1}{2}$  mm. from apex of cell, forming one continuous, oblique, straight line, bar  $R^1-R^2$  more distal, small, convex distad : discal bars  $SC^4-M^2$  widely separated from one another, small, the upper two, which are the heaviest, with drab coloured patches at proximal side, bar  $R^2-R^3$  generally a mere dot, bar  $R^3-M^1$  mostly curved, no discal bar  $M^2-SM^2$ , the discal interspaces milky white, much wider than the median ones, proximal portions of postdiscal interspaces also white, fused with the discal ones, so that the discal bars  $R^1-M^2$  are placed within the white area, rest of postdiscal interspaces drab colour with a series of internervular, cadmium yellow, spots which decrease in size costad and are distally bordered by the black postdiscal bars, of these latter bars  $SC^5-R^3$  are minute, bars  $SC^3-SC^5$  subtriangular, bars  $M^2-SM^2$  fused to one, nearly quadrangular, patch, the diameters of which are about 2 and 3 mm. ; submarginal bars tawny olive, uniform, convex distally,  $1\frac{1}{2}$  mm. from edge of wing between veins, last three less curved, last two joined together and more black, submedian interspaces ecru drab with darker centres, posterior ones like posterior admarginal interspace shaded with pale blue ; marginal line drab ; longitudinal, whitish, dashes at ends of internervular folds.—Hindwing : basal costal bar vestigial, close to base of wing, PC edged with rufous chestnut, no submedian and median costal bars ; all the basal to median bars thin, except bars  $C-SC^2$ , which are close together, and cell-bar 2, as well as upper portions of cell-bar 4 ; subbasal bar  $M^1-(SM^1)$  joined along  $(SM^1)$  to submedian bar, median bars  $M^2-(SM^1)$  and  $(SM^1)-SM^2$  both curved basad near  $(SM^1)$ , the prolongations soon fused to a line which extends to submedian series ; median bar  $SC^2-R^1$  at or beyond  $D^2$ , bar  $R^2-R^3$  about 1 mm. more distal than bar  $D$  ; discal bars black, uniform, the upper three heavier than the others, bar  $R^2-R^3$  the most distal of the series, bars  $M^2-SM^3$  almost straight, slightly oblique to veins, somewhat inclining basad posteriorly : discal interspaces drab colour at discal bars, this colour filling up the greater part of interspaces  $R^2-M^2$ , while the rest of the discal interspaces (as well as cell) is creamy white ; postdiscal bars thin, uniform, the series parallel to the discal one, but the upper three bars are little wider apart from the discal ones than bars  $R^2-M^2$ , postdiscal interspaces obscurely cadmium yellow and greenish buff, the upper ones more yellow than the others ; admarginal black bars shaded with pale blue, upper three straight, but not continuous, the following ones more distal (owing to the form of the wing) and also heavier, except bar  $M^1-M^2$  which is nearly entirely replaced by blue scaling ; white submarginal spots larger than the black ones, submarginal interspaces ecru drab ; admarginal interspaces  $C-R^2$  cadmium yellow, well-defined, edged with creamy white, the others greenish buff, more or less white at veins ; tails long, upper one pointed, 4 to 7 mm. long, second of nearly even width, 6 to 11 mm. long.

♀. Larger than ♂, body above as in ♂, or olivaceous tawny. Wings broader than in ♂, tails longer. Upperside of wings umber brown towards base, or basal area rufous tawny ; markings larger than in ♂.—Forewing : markings yellowish buff or orange buff, discal band paler behind, discal and postdiscal spots  $SC^5-R^3$  more or less fused together to long streaks, discal bars  $R^3-M^1$  absent or vestigial.—Hindwing : discal band like that of forewing, rather paler : submarginal spots as in ♂, larger ; admarginal spots  $C-R^1$  more or less tawny, sometimes faint.

*Underside* : as in ♂, submarginal pale blue patches  $R^2-SM^2$  of hindwing large.



Length of forewing; ♂, 34—39 mm.

" " ♀, 39—45 mm.

Tenth tergite of abdomen (♂) rounded triangular, subtruncated, with the trace of a sinus; clasper slender, almost gradually narrowed to a point from beyond middle to end, the apical third very slender, slightly curved mesiad, armed on the dorsal edge by a tooth which points sharply mesiad (Pl. VIII. f. 36); penis-funnel short, narrow, apex convex dorsally, extreme tip suddenly narrowed and curved downwards, forming a sharp hook; penis with a dorsal series of teeth, the proximal teeth a little larger and placed towards the left side.

The seventh ventral segment of the abdomen of the ♀ (Nov. Zool. V. p. 559, f. 14) convex in middle postically forming a cavity at the mouth of the vagina.

*Hab.* East Africa, from Natal (?) to Abyssinia, and from there to Senegambia and the hinterlands of the West Coast as far south as the Niger; not known from the true West African forest region. A rather common insect in British Central Africa. In the Tring Museum 50 ♂♂, 9 ♀♀ from: Gold Coast; Bathurst; R. Gambia; Abyssinia; Wakibara, Unyoro, 9. vii. and 23. vii. '97 (Dr. Ansorge); Ndi, Brit. E. Afr., 20. iii. '95 (Dr. Ansorge); Kilwezi, 5. ii. '95 (Dr. Ansorge); Zomba, Nyassaland, xii '95 (Dr. Percy Rendall); Likoma, Nyassaland, 1. vi., 2. vi., 12. vi., 15. vi., 16. vi., 17. vi., 3. vii., 11. vii., 15. vii., 17. vii., 20. vii., 21. vii., 1896 (Rev. Dutton); Lauderdale, Nyassaland; Chipaika Estate, Bandawe, Nyassaland (F. Watkinson); Delagoa Bay, vi.; at various places between Lialui and Njoko, Upp. Zambesi, iv. '98 (Coryndon); Calweha R., Angola, 29. iii., 15. iv., 30. iv., 1. v., 11. v., 12. v., 20. vi. '98 (Penrice); Olimbinga R., Angola, 3. iv. and 2. v. '98 (Penrice); Benguella to Caconda, Angola, v. '97 (Penrice); Natal (Felder; correct ?); Zambesi (Felder).

The similarity between the ♀ of *Ch. achaemenes*, *Ch. guderiana*, and ♂♀ *Ch. pelias saturnus* is very striking (see Nov. Zool. VII. t. 12. f. 1. 2. 3.).

Mr. Coryndon, when trekking down the Zambesi from Lialui, observed this species being often attracted by the meat (antelopes, etc.) hung on to the waggon; he found it also feeding on the trunk of a small wounded tree.

j<sup>2</sup>. Bars in basal half of *underside* thin, black, seldom tawny, but in the latter case not edged with black; or partly absent.

o<sup>3</sup>. Discal bars of fore- and hindwing, below, black, regularly arched.

o<sup>4</sup>. Discal bars M<sup>1</sup>—SM<sup>2</sup> of forewing below absent, or vestigial, placed within a white disco-postdiscal band; fore- and hindwing below with red or yellow postdiscal spots.

k<sup>5</sup>. Band and spots of upperside cream colour or yellow.

#### 67. *Charaxes fabius*.

*Papilio Eques Achirus fabius* Fabricius, *Spec. Ins.* II. p. 12. n. 47 (1782) (India).

♂♀. *Body above* bistre brown, thorax slightly olivaceous; *underside* creamy buff to clayish buff, palpi paler.

♂. *Wings, upperside*: brownish black, bistre brown at base, with creamy white or deep maize yellow markings.—Forewing rather pointed; a band of three patches runs straight across veins from M<sup>1</sup> to internal margin which it reaches beyond middle; these patches are homologous of the discal and postdiscal interspaces which are fused together, the band is continued costad and apicad by two series of spots, an inner, discal, series, of which spot R<sup>3</sup>—M<sup>1</sup> is often absent, spot

$R^2$ — $R^3$  stands closer to cell, and spots  $SC^1$ — $R^2$ , often partly absent, are placed at  $\frac{1}{3}$  of the way from cell to apex of wing; and an outer, postdiscal, series of 4 or 5 spots running apicad but curving costad at  $SC^5$ , spot  $SC^4$ — $SC^5$  often absent; a series of submarginal dots, becoming minute or obsolete costad, the last three always present.—Hindwing: an almost straight discal band, which is pale in front, extends from costal margin to  $M^2$  or ( $SM^1$ ), its inner edge crosses  $M$  at origin of  $M^1$ , its width variable according to locality; a series of small white or yellowish submarginal spots, the last two with some blue or olive buff scaling at outside; admarginal spots maize yellow or creamy, narrow upon internervular folds or divided into triangular spots, spot  $C$ — $SC^2$  always absent, often also the next one, the last one or ones mostly olive buff.

*Underside*: ecru drab or fawn colour, the outer region sometimes deeper drab colour or shaded with tawny olive, bars black.—Forewing: cell-bar 1 absent, 2 a dot, 3 represented by two spots or complete, 4 nearly straight or angled; bar D not, or little, dilated in front; submedian bar not distal of base of  $M^1$ , generally midway between bases of  $M^1$  and  $M^2$ , submedian bar  $R^3$ — $M^1$  absent; median bars  $R^3$ — $SM^2$  at right angles to veins (or nearly so), bar  $M^1$ — $M^2$  sometimes arched, bar  $R^2$ — $R^3$  in front of  $R^3$ — $M^1$  or more proximal, bars  $SC^3$ — $R^2$  at nearly  $\frac{1}{3}$  the way from cell to apex of wing, discal interspaces at outer side of median bars with creamy white or pale yellow patches, which are partly absent in some forms; discal bars more or less arched, bars  $SC^1$ — $M^1$  forming the proximal border of postdiscal spots, which correspond in size and position to those of the upperside, discal bar  $R^3$ — $M^1$  sometimes very close to median one, with the interspace between of the ground colour; the creamy or pale yellow patches  $M^1$ — $SM^2$  represent the discal and postdiscal ones fused together, sometimes patch  $M^1$ — $M^2$  divided by a luniform discal bar into a discal and postdiscal portion; submarginal bars represented by black spots, of which spots  $M^2$ — $SM^2$  form a large double patch, contiguous with this series (and marked even if the submarginal spots are obsolete) is a series of chrome yellow or deep chrome spots which are larger than the black submarginal spots and gradually decrease in size costad; the submarginal patches  $M^1$ — $SM^2$  with creamy scaling at outside which forms a spot between  $M^2$  and  $SM^2$  which resembles the figure 3.—Hindwing: subbasal costal bar and basal cell-spot absent; submedian series stopping at ( $SM^1$ ), crossing  $M$  at, or close to, base of  $M^2$ ; median series somewhat irregular, but nearly straight from costal margin to  $R^3$ , bars  $M^2$ — $SM^2$  about at right angles to ( $SM^1$ ), the series reaching  $M$  at or a little beyond base of  $M^2$ ; veins  $SM^2$  and  $SM^3$  sometimes partly black; discal interspaces in most forms with creamy white patches at median bars; discal bars thin, arched, lunule  $R^3$ — $M^1$  more proximal,  $R^2$ — $R^3$  more distal, than the others, hence the series angled at  $R^3$ ; the discal lunules followed at 1 to 2 mm. distance by a series of chrome yellow or red halfmoons, of which the second is sometimes obsolete; these halfmoons are contiguous with the black postdiscal bars, which are obliterated in some forms; white submarginal dots  $C$ — $R^2$  sometimes obsolete, black submarginal bars linear, with blue spots at proximal side, the bars contiguous with yellow or olive buff admarginal interspaces which are paler at veins; tails acute, second at least as long as first.

♀. Like ♂, but larger, wings broader, tails longer and less pointed, the first longer than second, creamy white or yellow marking wider.

Length of forewing: ♂, 30—40 mm.

“ “ ♀, 34—48 mm.

Clasper apically produced into a hook, variable in the different subspecies, the thickened basi-ventral part armed with a tooth or dentate process; penis-funnel curved downwards, forming a strong and sharply pointed hook; penis armed with teeth, dilated, 1 or 2 mm. before the end, into a ridge; tenth tergite bluntly triangular, with the apex more or less sinuate.

*Hab.* From Ceylon and N. India to Sumatra, Borneo, the Philippines, Celebes, and the Sula Is.; not found in Java, not recently on the Andaman and Nicobar Islands, but recorded by Godart (1823) from the Nicobars (by mistake?).

The sexual armature of the ♂♂ is obviously different in the several geographical races (compare figs. 20—23, 37—44, 50—53 of Plate VIII.).

The species is of an African type and lives in more open country, not in the dense forest.

#### a. *Ch. fabius lampedo*.

*Eriboea lampedo* Hübner, *Samml. Er. Schm.* II. t. 52. f. 3. 4. ♀ (1816-?).

*Nymphalis lampedo*, Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 31 (1850).

*Charaxes lampedo*, Butler, *Proc. Zool. Soc. Lond.* p. 628. n. 20 (1865); Semper, *Tagf. Philipp.* p. 79.

n. 99 (1887) (Mariveles, Luzon; Cebu); id., *l.c.* p. 335. n. 99 (1892) (S.E. Mindanao; Palawan);

Butl., *Journ. Linn. Soc. Lond.* XXV. p. 356. n. 17 (1896) (Palawan).

♂. *Charaxes zephyrus* Butler, *Cist. Ent.* I. p. 5 (1869) (hab. ?); id., *Lep. Exot.* p. 27. n. 4. t. 10. f. 1. (1870).

*Nymphalis fabius* var. a. *Eriboea lampedo*, Kirby, *Cat. Diurn. Lep.* p. 269. sub n. 18 (1871).

*Charaxes fabius* var. *lampedo*, Staudinger, *Iris* II. p. 82 (1889) (Palawan).

♂♀. *Wings above*: yellowish olivaceous buff towards base, markings deep maize yellow.—Forewing: discal and postdiscal spots  $R^3$ — $M^1$  separate, of the same size, or the discal one somewhat smaller, no streaks in front of discal spot  $SC^5$ — $R^1$ ; postdiscal spot  $SC^4$ — $SC^5$  absent; of the submarginal series spots  $SC^4$ — $R^3$  are absent, spot  $R^3$ — $M^1$  is generally obsolete.—Hindwing: discal band somewhat wider behind than between  $SC^2$  and  $R^2$ , approaching admarginal spots posteriorly; the latter constricted but not divided between veins in ♀, more or less divided into triangular spots in ♂.

*Underside*: fawn colour.—Forewing: discal bar  $M^1$ — $M^2$  at least vestigial, arched; yellow postdiscal spots deep chrome colour.—Hindwing: the discal luniform bars all well marked, postdiscal rufous red spots all present, spot  $SC^2$ — $R^1$  not obsolete; no black postdiscal bars; median bars bordered white distally, with or without white patches at outer side; admarginal buff spots slightly more yellow or olive buff between veins; tails ♂, first 4, second 5 to 6 mm.; ♀, first 7 to 9, second  $5\frac{1}{2}$  to 7 mm.

Length of forewing: ♂, 37—40 mm.

“ “ ♀, 44—46 mm.

Sexual organs of ♂ on Pl. VIII.: clasper (f. 37 side view, f. 38 dorsal view) with a long irregularly dentate subventral process, apex of clasper with a hook of which the outer edge is slightly denticulated, and a short round lobe; penis dilated about 2 mm. before the end (f. 20), the dilated dorsal part dentate; penis-funnel short, but slender.

*Hab.* Philippine Islands: Palawan, 1 ♂, 1 ♀ (Dr. Platen); Mindoro, 1 ♀ (Dr. Platen); Mindanao, 1 ♂, 1 ♀ (Dr. Platen); Luzon (Semper); Cebu (Semper); Mariveles (Semper).

The discal interspaces of the hindwing below are in the Palawan specimens we have seen more extended white than in those from Mindoro and Mindanao, especially

in the ♀; whether this difference is constant, we do not know, as we have not examined a longer series of *lampedo*. Hübner's figure (without locality) agrees best with Palawan examples, while the type of *zephyrus*, which has also no locality, is without distinct white discal band on the *underside* of the hindwing.

**b. *Ch. fabius hannibal* (Nov. Zool. V. t. 7. f. 1. ♂).**

*Charaxes hannibal* Butler, *Lep. Exot.* p. 14. n. 3. t. 6. f. 5 (1869) (Tondano; Macassar); Rothsch., *Iris* V. p. 437 (1892) (S. Celebes); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 357. n. 19 (1896) (Tondano; Macassar; ♀ of *echo*?).

*Nymphalis fabius* var. *b. Ch. hannibal*, Kirby, *Cat. Diurn. Lep.* p. 269. sub n. 18 (1871) (Celebes). *Nymphalis fabius*, Pagenstecher, *Ab. Senk. Gesellsch.* XXIII. p. 403. n. 183 (1897) (Minahassa).

♂ ♀. *Wings above*: with the markings cream colour.—Forewing: discal and postdiscal spots  $R^3-M^1$  of the same size, or discal one larger, sometimes fused together; patch  $M^2-SM^2$  at least twice as long as (in direction of veins) broad; submarginal dots  $M^1-SM^2$  small, the others absent.—Hindwing: band narrowing behind; admarginal spots mostly divided into triangular dots.

*Underside*: fawn colour.—Forewing: median bar  $R^2-R^3$  continuous with bar  $R^3-M^1$  or very little more proximal; discal luniform bar  $R^3-M^1$  marked, at least vestigial, but bar  $M^1-M^2$  not present, except a vestige of it behind  $M^1$ ; postdiscal yellow spots small, deep chrome colour, sometimes tinged with rufous.—Hindwing: series of median bars straight to ( $SM^1$ ), with a narrow white band at outside; discal bars well-marked, black, regularly arched, postdiscal rufous red spots all present, no black bars at their outside; admarginal spots smaller than in *lampedo*, farther from margin.

♀. Like ♂, but band of upperside twice as wide, that of hindwing at least as wide behind as in front, approaching submarginal dots behind; admarginal dots  $R^3-M^1$ , or even  $R^2-M^1$ , of forewing vestigial; tails longer, especially upper one.

Length of forewing: ♂, 37–40 mm.

„ „ ♀, 46–48 mm.

Sexual organs of ♂♂, see Pl. VIII.; clasper with a sharp hook and a blunt lobe at apex (f. 39 side view, f. 40 dorsal view), inner ventral armature consists of a rectangular ridge which is not produced into a distinct tooth; penis (f. 21) armed dorsally with a series of teeth, which becomes doubled and trebled, where the penis is dilated, and turns round towards the ventral side where the denticulation is very heavy; penis-funnel slender, much less curved than in *fabius fabius*, suddenly hooked at end (f. 50).

*Hab.* Celebes: Maros country, S. Celebes, W. Doherty, August–September 1891, 4 ♂♂, 1 ♀; Talant, W. Doherty, February–March 1892, 1 ♀; Sangir, W. Doherty, February–March 1892, 1 ♀.

In the Sangir examples the rufous red postdiscal spots of the underside of the hindwing are rather larger than in the ♀♀ from Celebes and Talant.

**c. *Ch. fabius mangolianus* Rothsch., subsp. nov.**

♀. *Wings above*: with the markings nearly as yellow as in *lampedo*, except the submarginal spots of the forewing, which are creamy white; band of fore- and hindwing from  $M^1$  of forewing to ( $SM^1$ ) of hindwing narrower than in *hannibal* ♀.—Forewing: more elongate than in *hannibal* ♀, submarginal spots  $R^1-SM^2$  present, spot  $SC^5-R^1$  vestigial, the last two fused together.



*Underside*: median bars and black postdiscal spots of forewing, and discal arched bars of hindwing obviously heavier than in *lampedo*; discal interspaces of forewing more suffused with white; rufous red postdiscal patch  $SC^2-R^1$  of hindwing absent.

Length of forewing: ♀, 48 mm.

*Hab.* Mangoli, Sula Islands, 1 ♀ (Dr. Platen); also in Dr. Staudinger's collection.

*d. Ch. fabius echo* (Nov. Zool. V. t. 7. f. 2. ♀).

*Charaxes echo* Butler, *Ann. Mag. N. H.* (3). XX. p. 400. t. 8. f. 5. 6. ♂ (1867) (Singapore); Druce, *Proc. Zool. Soc. Lond.* p. 346 (1873) (Malacca); Dist., *Rhop. Mal.* p. 103. n. 1. f. 38 (1883) (Singapore); Mal. Pen.; Borneo); Nicév. & Martio, *Journ. As. Soc. Beng.* LXIV. 2. p. 437. n. 260 (1895) (Selesseh); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 357. n. 18 (1896) (Labuan; Sarawak); Hagen, *Iris* IX. p. 183. n. 241 (1896) (N. E. Sumatra). *Nymphalis fabius* var. *c. Char. echo*, Kirby, *Cat. Diurn. Lep.* p. 269. sub n. 18 (1871). *haraxes echo sumatranus* Rothsch., *Nor. Zool.* V. expl. of Pl. VII. (1898) (Sumatra).

♂. *Wings above*: slightly olivaceous at base, markings sulphur or cream yellow.—Forewing: discal spots  $R^3-M^1$  and  $R^1-R^2$  absent, only spots  $SC^5-R^1$  and  $R^2-R^3$  being marked; patches  $M^1-SM^2$  rather widely separated; the postdiscal series extending to  $SC^5$ ; last three submarginal dots present.—Hindwing: band very narrow, about  $1\frac{1}{2}$  to 2 mm. broad behind  $SC^2$ , narrowing behind or of nearly the same width; submarginal dots very prominent, as large as or much larger than the admarginal spots; the latter separated into small dots.

*Underside*.—Forewing: discal creamy white patches  $M^1-SM^2$  rather larger than above, no discal patches  $SC^5-M^1$ , but the discal interspaces sometimes suffused with white scaling; discal bar  $M^1-M^2$  absent; postdiscal spots  $SC^5-M^1$  much shaded with drab colour, postdiscal yellow spots chrome colour, the last two generally much larger than the others; cell-bar 3 not distinctly divided into dots, generally complete, cell-bar 4 straight; median bars  $R^2-M^1$  continuous.—Hindwing: median bars  $C-R^3$  continuous, with a white band at outside; discal luniform bars bordered with bluish white distally (which is not the case in any of the preceding subspecies), bar  $SC^2-R^1$  sometimes obsolete; postdiscal spots deep rufous red, spot  $SC^2-R^1$  obsolete, or, if marked, more yellow than the others and far apart from discal bar, nearly all the spots with an indication of the black postdiscal bar at outside; black submarginal spots more or less linear.

♀. Like ♂, but the markings of the upperside rather wider.

Length of forewing: ♂, 30—33 mm.

” ” ♀, 34 mm.

Clasper more widened dorsally at end than in the other forms (Pl. VIII. f. 41. 42.), the internal subventral ridge produced into a short tooth; penis very short, thick, dorsally with 2 to 4 curved teeth about  $1\frac{1}{2}$  mm. before the end (f. 22); penis-funnel slender, rather long (f. 51), much less curved than in *fabius fabius*.

*Hab.* Malay Peninsula, Singapore (*type*), and Borneo: Perak, 1 ♂; Pengaron, S.E. Borneo, 1 ♂; N.E. Sumatra: Selesseh, 1 ♀, 21. xi. '93, and Battak Mts., 1 ♂, 8. vii. '94 (Dr. Martin).

I considered at first the individuals from Sumatra, in which the white discal band of the underside of the hindwing is obsolete, to represent a separate subspecies. but on comparing more material from Borneo and the Malay Peninsula I find that the difference does not hold good in every case.

*e. Ch. fabius sulphureus* Rothsch., subsp. nov.

*Charaxes fabius*, Nicéville, *Bull. of India* II. p. 280. n. 570 (1886) (Thoungyeen; Mepley); Adams, *List Burm. Lep.* p. 20 (1889) (Arakan, III. to V.); Manders, *Tr. Ent. Soc. Lond.* p. 526. n. 92 (1890) (Shan States, XII., 5000 ft.); Wats., *Journ. Bombay N. H. Soc.* VI. p. 41. n. 93 (1891) (Pauk to Tilin, X.; Tilin, III.); id., *l.c.* X. p. 657. n. 121 (1895) (Chin Hills, IV.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 356. n. 16 (1896) (pt.; Thoungyeen; Tilin Yaw); Moore, *Lep. Ind.* II. p. 249 (1896) (pt.).

♂. *Wings above*: olive black, more greenish olive towards base; markings brimstone yellow.—Forewing: discal spot  $R^3$ — $M^1$  absent, spot  $R^1$ — $R^2$  absent or minute; postdiscal spot  $SC^4$ — $SC^5$  about as large as spot  $R^1$ — $R^2$ ; submarginal dots marked up to  $R^3$  or  $R^2$ .—Hindwing: band tapering behind, about 3 to 4 mm. broad behind  $SC^2$ ; admarginal spots divided into triangular dots, except anal one which is complete and bluish olive buff.

*Underside*: ecru drab; postdiscal yellow spots of both wings chrome yellow.—Forewing: cell-spots heavy as a rule, cell-bar 4 angled in middle, bar D heavier than in all the preceding races; white discal spots  $SC^5$ — $R^1$  and  $R^1$ — $R^2$ , and postdiscal ones  $SC^4$ — $M^1$  clearly marked; median bar  $M^1$ — $M^2$  almost straight, discal bar  $M^1$ — $M^2$  very seldom vestigial and then placed close to median one; no white patch between discal and median bars  $R^3$ — $M^1$ ; postdiscal yellow spot  $SC^4$ — $SC^5$  obsolete.—Hindwing: discal interspaces more or less white, this band stopping sometimes at  $M^2$ , sometimes reaching abdominal margin; discal luniform bars bordered with bluish white externally; postdiscal chrome yellow spots all present, bordered outwardly by the olive black postdiscal bars, the spots surrounded with more or less conspicuous greenish olive scaling; admarginal spots yellow between, creamy white at veins, except at veins C and  $SC^2$ ; basal costal bar short, but rather heavy.

♀. Unknown.

Length of forewing: ♂, 32—36 mm.

Clasper similar to that of *fab. fabius*, but the dorsal lobe triangular and more prominent; penis as in *fabius*; penis-funnel short, denticulate beneath (f. 52).

*Hab.* Tenasserim and Shan States. 3 ♂♂ in the Tring Museum from: Muong Gnow, vii. to ix. '94, Ynuzalun, xi. '91 (Bingham), Thaungyin valley, 14. v. '93 (Bingham).

*f. Ch. fabius fabius.*

*Papilio Eques Achirus fabius* Fabricius, *Spec. Ins.* II. p. 12. n. 47 (1781) (India; Mus. Banks); id., *Mant. Ins.* II. p. 7. n. 52 (1787); Gmel., *Syst. Nat.* I. 5. p. 2235. n. 304 (1790).

*Papilio Nymphalis fabius* Fabricius, *Ent. Syst.* III. 1. p. 64. n. 201 (1793).

*Papilio Nymphalis solon* Fabricius, *Ent. Syst.* III. 1. p. 69. n. 216 (1793) (hab.?).

*Papilio Eques Achirus euphanes* Esper, *Aust. Schmett.* p. 238. t. 59. f. 1. ♂ (1785-98).

*Nymphalis fabias*, Godart, *Enc. Méth.* IX. p. 353. n. 8 (1823) (Nicobar Is.); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 28 (1850) (India); Horsf. & Moore, *Cat. Lep. Ins. Mus. E. I. C.* 1. p. 205. n. 416 (1857) (N. India); Kirby, *Cat. Diurn. Lep.* p. 268. n. 18 (1871) (India).

*Charaxes fabius*, Doubleday, *List Spec. Lep. Ins. Brit. Mus.* I. p. 110 (1844) (N. India); Butl., *Proc. Zool. Soc. Lond.* p. 628. n. 19 (1865) (India; Indian Is.); id., *Cat. Diurn. Lep. descr. by Fabr.* p. 52. n. 10 (1869) (Madras); Moore, *Lep. Ceyl.* I. p. 29. t. 15. f. 1 (1880-81); id., *Proc. Zool. Soc. Lond.* p. 238 (1882) (Dharmasala, VII., at sugar); Swinh., *ibid.* p. 130. n. 42 (1885) (Poona, IV. XI.; Belgaum; Bombay, XI.); Nicéville, *Journ. As. Soc. Beng.* LIV. 2. p. 45. n. 52 (1885) (Calcutta); Swinh., *l.c.* p. 425. n. 33. (1886) (Mhow, VI. X.); Doherty, *Journ. As. Soc. Beng.* LV. 2. p. 124. n. 93 (1886) (Kumaon, foot of hills); Wood-Mas. & Nicéville, *ibid.* p. 363. n. 101 (1886) (Cachar, IX.); Nicéville, *Bull. of Ind.* II. p. 280. n. 570 (1886) (pt.; Oudh; Chumba, III.; Mundi, VII. IX.; Sikkim; Assam; Cachar; Calcutta, common; Orissa;

Poona ; Belgaum ; Bombay ; Travancore ; Ceylon) ; Aitk., *Journ. Bombay N. H. Soc.* I. p. 133. n. 26 (1886) (Khandeish ; Tanna) ; Hamps., *Journ. As. Soc. Beng.* LVII. 2. p. 355. n. 82 (1888) (Nilgiris, 3 to 4000 ft.) ; Elwes, *Tr. Ent. Soc. Lond.* p. 368. n. 211 (1888) (Sikkim) ; Davids. & Aitk., *Journ. Bombay N. H. Soc.* V. p. 278. n. 39. t. A. f. 3. 3a (1890) (metam.) ; Betham, *ibid.* V. p. 285. n. 50 (1890) (Centr. Prov.) ; Fergus., *ibid.* VI. p. 440. n. 81 (1891) (Travancore) ; Davids., Bell & Aitk., *ibid.* X. p. 258. n. 66 (1895) (Canara, habits) ; Moore, *Lep. Ind.* II. p. 251. t. 183. f. 1. 1a. 1b. 1c. 1d., 1, p., ♂, ♀ (1896) ; Bntl., *Journ. Linn. Soc. Lond.* XXV. p. 356. n. 16 (1896) (pt.) ; Mhow ; Bombay ; Poona ; Nilgiris ; Madras ; Ceylon) ; Nicév. & Mackinn., *Journ. Bombay N. H. Soc.* XI. p. 377. n. 123 (1897) (Mussorie, IV. and IX., rare).

*Nymphalis solon*, Godart, *Enc. Méth.* IX. p. 357. n. 24 (1823) ; Donbl., Westw. & Hew., *l.c.* p. 309. n. 26 (1850).

*Charaxes solon*, Butler, *Proc. Zool. Soc. Lond.* p. 628. n. 22 (1865).

♂. Like *Ch. fabius sulphureus*, but markings of upperside deep maize yellow postdiscal spots of forewing above larger, penis-funnel more evenly convex beneath, not denticulate. There are one or two short streaks in front of the discal spot  $SC^5-R^1$  of the forewing above ; the discal spot  $R^3-M^1$  of the upperside of the forewing is sometimes indicated by an obscure lunule.

♀. Like ♂, but markings of upperside larger, sometimes all the submarginal spots of the forewing present ; discal spot  $R^1-R^2$  of forewing always vestigial, patches  $M^1-SM^2$  touching one another at veins.

Length of forewing : ♂, 33—41 mm.

” ” ♀, 34—43 mm.

Penis (f. 23) compressed, the right side more or less membraneous, a series of teeth above, the most distal rather high, the others forming a ridge ; penis-funnel strongly curved, forming a very sharp hook (f. 53) ; clasper produced into a sharp slender tooth at end, dorsal edge raised before end into a lobe (f. 43. 44.).

*Hab.* Sikkim (low country) to S. India and Ceylon ; 20 ♂♂, 5 ♀♀.

In the Ceylon specimens the postdiscal interstitial spots of the forewing above are on the whole smaller than in the individuals from the Continent.

l<sup>5</sup>. Band of upperside white, shaded with pale blue at edges.

## 68. *Charaxes hildebrandti*.

*Nymphalis hildebrandti* Dewitz, *Nov. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 28. t. 2. f. 16. ♂ (1879) (Angola).

*Charaxes hildebrandti*, Aurivillius, *Ent. Tidskr.* XV. p. 311. n. 195 (1894) (Cameroons) ; Bntl., *Journ. Linn. Soc. Lond.* XXV. p. 363. n. 32 (1896) (Ondo country, Lagos) ; Auriv., *Kongl. Sr. Vet. Ak. Handl.* XXXI. 5. p. 236. n. 27 (1899) (Ashanti ; Lagos ; Cameroons ; Ogowé R. ; Kuilu R. ; Bena-Bendi, Congo ; Angola).

*Charaxes galba* Distant, *Proc. Zool. Soc.* p. 709 (1879) (= *hildebrandti* accord. to Distant ; hence “*galba*” nom. max. superfl.).

*Charaxes talagugae* Holland, *Tr. Amer. Ent. Soc.* XIII. p. 332. t. 8. f. 3 (1886) (Ogowé R.).

♂. *Body above* blackish olive, more russet in front, four dots on head and a line, behind eye white, no dorsal dots on pronotum ; *underside* greyish creamy white, femora blackish above ; antennae chestnut, club black.

♂. *Wings, upperside* : brownish black ; a creamy white band runs across both wings, edged with pale glaucous blue.—Forewing : band separated into spots, except behind, 6 mm. broad at internal margin, tapering in front, spot  $SC^4-SC^5$  often absent, spots  $SC^4-R^2$  a little more distal than the others, 6 to 7 mm. from

outer margin, the band proximally without pale blue edge between  $SC^{4.5}$  and  $M^1$  or  $M^2$ ; there is occasionally a vestige of a median bar within patch  $R^3-M^1$ .—Hindwing: band inclusive of pale glaucous blue borders 7 to 8 mm. broad in middle, stopping at ( $SM^1$ ), no blue scaling proximally between C and  $R^1$ ; submarginal white dots minute, mostly vestigial, anal admarginal interstitial spot linear, blue, a trace of a blue admarginal spot behind  $R^3$ , no other admarginal markings.

*Underside*: ecrn drab, bars black.—Forewing: cell-bar 2 short, bar 3 represented by two conspicuous dots, bar 4 angled in middle, the angle pointing distad, much nearer base of  $M^2$  than that of  $M^1$ ; bar D very thin; submedian bar  $M^2-(SM^1)$  heavy, bar  $M^1-M^2$  about 1 mm. more distal than bar  $M^2-(SM^1)$  and than cell-bar 4; median bars  $SC^{4.5}-R^3$  almost continuous, very thin, 6 mm. from cell at  $R^1$ , bar  $R^3-M^1$  about 1 mm. more distal, bars  $M^1-SM^2$  gradually a little more proximal, all the bars more or less straight, at right angles to the veins; discal interspaces  $R^3-SM^2$  milky white; discal bars brown, regularly arched, concave distally, thin, vestigial, or absent, bar  $R^3-M^2$  close to median bar, postdiscal interspaces milky white, last ones merged together with discal patches; postdiscal bar ( $SM^1$ )- $SM^2$  represented by a black patch, 4 mm. distant from outer margin, all the others replaced by wax yellow spots, which show distally sometimes vestiges of the black bars; these spots are homologous to the proximal borders of the discal bars, the series about parallel to outer margin, upper ones 5 to 6 mm. distant from it.—Hindwing: no basal and subbasal costal bars, subbasal bar C- $SC^{12}$  also absent; submedian series nearly continuous, or more obviously broken at veins, the bars more or less straight; median bars thin, continuous, the line crossing M at base of  $M^2$ , broken at  $SM^2$ , proximal half or more of discal interspaces white; discal bars arched, concave distally, all well marked, of even thickness, the series slightly convex in middle, all the bars with very thin, milky white, distal edges, followed by postdiscal, wax yellow, halfmoons which are bordered distally by the thin, black, postdiscal bars; submarginal white dots larger than above, posterior ones with purplish blue scales at outer side, followed by the black, short, submarginal bars; admarginal interspaces wax yellow, anal one more greyish olive buff; tails acute, upper one 3 to 4 mm., second 2 mm. long.

♀. Unknown.

Length of forewing: 34 to 36 mm.

$D^3$  of hindwing reaches M before joint of origin of  $M^1$ .

Clasper broad, dorsal edge convex, irregularly notched before end, apex gradually narrowed into a short-pointed hook; the ridge which extends from the end of the hook to the inner surface of the clasper notched, appearing denticulated; tenth tergite rounded.

*Hab.* West Africa from the Gold Coast to Angola. In the Tring Museum 4 ♂♂ from the Kailu R., French Congo, and from Leopoldville.

Resembles on the upperside *Ch. brutus*.

Specimens from N. Angola have generally more pale blue scaling on the hindwing than those from the countries farther north.

$p^1$ . Discal bars  $M^1-SM^2$  of forewing below present; if absent (some ♀♀), admarginal interspaces C- $R^3$  of hindwing occupied by thin, linear, rufous red bars.

$m^5$ . Median bars  $SC^3-SM^2$  of forewing below not continuous, bar  $R^2-R^2$  being more proximal than the others.



- m*<sup>6</sup>. Hindwing above with broad postdiscal, blue, band in ♂ ; ♀ ♀ unknown, except that of *guderiana*, which bears on upperside a close resemblance to *Ch. pelias* (see Nov. Zool. VII. t. 12).  
*y*<sup>7</sup> Forewing without large white submarginal spots ; admarginal interspaces C—R<sup>3</sup> of hindwing above not white.  
*c*<sup>8</sup>. Forewing above with a series of discal and a series of postdiscal blue spots.  
*c*<sup>9</sup>. Forewing above without obvious pale blue marginal patches ; median and discal interspaces of underside more or less glossy white.

69. *Charaxes blanda* (Nov. Zool. V. t. 6. f. 3. ♂).

*Charaxes blanda* Rothschild, Nov. Zool. IV. p. 507. n. 1 (1897) (Mikindani) ; Auriv., Kongl. Sc. Vet. Ak. Handl. XXXI. 5. p. 236. n. 25a and p. 538 (1899).

♂. *Body above* olive black, white dots on head and pronotum very prominent ; *underside* creamy buff, palpi and middle of breast creamy white, stripes on breast underneath legs black, anterior tibia black above.

♂. *Wings above* black, with a strong greenish blue gloss.—Forewing : more greenish in basal and internal marginal areas ; shaped as in *guderiana*, but outer margin obviously dentate ; a very small spot in upper angle of cell, a discal row of five somewhat larger spots SC<sup>4,5</sup>—M<sup>2</sup>, spots R<sup>2</sup>—R<sup>3</sup> however obsolete, being represented only by a very few scales, more proximal than the other spots, a postdiscal series of spots from SC<sup>4</sup> to internal margin, parallel to outer margin, but curving costad anteriorly, the first six spots small ( $\frac{1}{2}$  to  $\frac{2}{3}$  mm. in diameter), the last three measuring  $1\frac{1}{3}$ ,  $2\frac{1}{2}$ ,  $3\frac{1}{2}$  mm. respectively, the first 9 mm. from apex, the third 5 mm. from outer margin ; all the markings pale blue, the five upper postdiscal ones with large white centres : no admarginal spots ; fringe restricted white between veins. —Hindwing : a large disco-postdiscal patch pale blue, 9 mm. wide behind, 8 mm. in middle, while its two sections SC<sup>2</sup>—R<sup>2</sup> measure  $3\frac{1}{2}$  and 6 mm. respectively, two pale blue spots before SC<sup>2</sup>, the one in front of the patch, the other more basal and less distinct, behind the latter spot there are a few blue scales between SC<sup>2</sup> and R<sup>1</sup> ; white submarginal spots thin, linear, shaded with pale blue, the last two with reddish purple ; admarginal interstitial spots transverse, greenish blue, anal one ochraceous, upper ones absent, spots R<sup>3</sup>—M<sup>2</sup> continuous, with a yellow tint upon internervular folds ; abdominal fold wood brown, with a greyish white patch before anal angle.

*Underside* : broccoli brown, paler at base, bars heavy, proximal portions of discal interspaces, the median interspaces, inclusive of the apical interspace of the cell of the forewing greyish white, almost silvery, postdisco-marginal area of forewing also shaded with grey glossy scaling, except a small patch at costal margin, a larger one between M<sup>1</sup> and SM<sup>2</sup>, and a rather broad marginal band which terminates anteriorly at SC<sup>5</sup>.—Forewing : bars nearly in the same position as in *guderiana*, but submedian bar M<sup>1</sup>—M<sup>2</sup> exactly behind point of origin of M<sup>1</sup>, hence much nearer median bar M<sup>1</sup>—M<sup>2</sup> than in *guderiana* ; discal bars M<sup>1</sup>—SM<sup>2</sup> black, more proximal than in *guderiana*, the others brown, less conspicuous ; postdiscal bars M<sup>2</sup>—SM<sup>2</sup> represented by two elongate, black, patches ; between these and the discal bars two pale blue spots.—Hindwing : discal, arched, bars very prominent, postdiscal bar M<sup>2</sup>—SM<sup>2</sup> also very heavy ; white submarginal spots ill-defined, rather large,

transverse, except last two which are very small, with conspicuous blue dots at outer side between  $R^2$  and  $SM^2$ ; admarginal interstitial markings C— $R^3$  maroon red, with a fine white outer border, the other admarginal spots less sharply defined, yellowish olive buff; anal angle less produced than in *guderiana*, dentition heavy, tails slender, upper one 6 mm., second 7 mm. long.

♀. Unknown.

Length of forewing: ♂, 31 mm.

Clasper essentially different from that of *Ch. etheocles* and allies; the apical lobe of *Ch. etheocles* developed in *blanda* to a tooth, dorsal edge of clasper angled in apical third, dentate (f. 31. 32.); penis-funnel, in a dorsal view (f. 47), with almost parallel sides, then suddenly narrowed, the narrower portion compressed and slightly curved downwards; penis with some minute teeth dorsally, the row beginning about 1 mm. from end, some more teeth on the left side and also a few ventrally about 2 mm. from end; tenth tergite triangular, not sinuate.

*Hab.* German East Africa: Mikindani, 1 ♂ in the Tring Museum, caught between January and May (Reimer).

*d*<sup>9</sup>. Forewing above with pale blue marginal patches.

#### 70. *Charaxes northcotti* (Nov. Zool. VI. t. 8. f. 5. ♂).

*Charaxes northcotti* Rothschild, *Entom.* XXXII. p. 171. n. 1 (1899).

♂. *Body above* olive black, bistre brown in front, white dots on head and pronotum conspicuous; *underside* clayish buff, palpi and middle of breast creamy buff, upperside of anterior tibia mummy brown.

♂. *Wings upperside*: black, somewhat olive at base, marked with pale greenish blue and white.—Forewing: a small spot in upper angle of cell, consisting of blue and white scales, another very minute one behind  $R^2$  at outer side of  $D^3$ ; a series of discal spots, upper two white with some blue scales at edges, the third more proximal, spots  $R^3$ — $M^2$  more or less halfmoon-shaped, spots  $M^2$ — $SM^2$  vestigial or absent; a postdiscal series of spots parallel to outer margin, upper two white with blue edges and placed more proximal, the spots increasing in size posteriorly; admarginal spots large, pale blue; some dispersed blue scales between discal and admarginal series; fringe white, except at ends of veins.—Hindwing: a large discal patch, narrowing behind, limited by vein  $R^1$ , preceded by a small spot, outwardly concave between veins; white submarginal dots transverse, small, rather heavily bordered pale blue, last ones shaded with reddish purple; admarginal pale blue spots heavy, anal one ochraceous.

*Underside*: as in *Ch. ethalion*, wood brown, slightly cinnamon, with a silky gloss.—Forewing: discal interspaces greyish at outer side of median bars; postdiscal black patch  $M^2$ — $SM^2$  prominent, the respective postdiscal and submarginal interspaces grey.—Hindwing: postdiscal interstitial halfmoons not prominent; upper four admarginal interstices rufous red, the others olive yellow.

♀. Unknown.

Sexual organs similar to those of *Ch. etheocles*, the ventral ridge of the penis higher than in fig. 16.

*Hab.* Hinterland of the Gold Coast, 2 ♂♂: Gambaga, near the Volta R., 28. viii. '98 (Northcott); Kumassi to Cape Coast Castle, iv. '99 (Capt. Giffard).

A third ♂ from the same country in Miss Sharpe's collection.

Colonel Northcott, the discoverer of this species, fell in the battle on the Modder River.

*d*<sup>8</sup>. Forewing above without blue discal spots between *R*<sup>2</sup> and *M*<sup>2</sup>.

#### 71. *Charaxes kheili*.

♂. *Charaxes kheili* Standinger, *Iris* IX. p. 216. t. 2. f. 4 (1896) (Njam-Njam); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 237. n. 33 (1899) (Niam-Niam; Zongo; Sassa).

♂. Differs from *Ch. northcotti* in the following points:—

*Upperside*.—Forewing: more falcate, spot in cell larger, discal series of interstitial spots consisting only of two spots *SC*<sup>4.5</sup>—*R*<sup>2</sup>; posterior postdiscal and admarginal spots smaller.—Hindwing: the blue band is narrower, though it varies considerably in width, a little farther away from the submarginal dots than in *northcotti*.

*Underside* essentially as in *northcotti*.

♀. Unknown.

Length of forewing: ♂, 36 mm.

*Hab.* Njam-Njam, coll. Standinger; Congo: Zongo, Mokoanghay (Lt. Tilkens), Sassa, Mns. Bruxelles.

*k*<sup>7</sup>. Forewing above with white marginal patches.

#### 72. *Charaxes guderiana* (Nov. Zool. VII. t. VII. f. 7. ♂, t. XII. f. 3. ♀).

*Nymphalis guderiana* Dewitz, *Nov. Act. Leop. Cur. Ak. Naturf.* XLI. 2. 2. p. 29. t. 2. f. 18. ♂ (1879) (Angola).

*Charaxes guderiana*, Trimen, *Proc. Zool. Soc. Lond.* p. 81. n. 37 (1891) (S.-W. Afr.: Omrora, VIII.; Ebanda, IX.; S. Mashonaland); Butl., *ibid.* p. 648. n. 18 (1893) (Brit. C. Afr., I. VIII. XII.); Trim., *l.c.* p. 42. n. 66. t. 5. f. 8. ♀ (1894) (Manica, III. IV.); Butl., *l.c.* p. 561. n. 16 (1894) (Brit. E. Afr., Fuladoya); Reb. & Rog., in Baumann, *Massailand* p. 332. n. 99 (1894) (Ussuri; Sogonoi); Butl., *l.c.* p. 254. n. 14 (1895) (Fwamba, Nyassaland); id., *l.c.* p. 720. n. 9 (1895) (Zomba); id., *Journ. Linn. Soc. Lond.* XXV. p. 358. n. 21 (1896) (L. Mweru; Zomba; Fwamba; Brit. E. Afr.); id., *Proc. Zool. Soc. Lond.* p. 822. n. 12 (1896) (Deep Bay, Nyassaland); id., *l.c.* p. 852. n. 12 (1896) (Nyassaland); id., *Ann. Mag. N. H.* (6). XVIII. p. 68. n. 4 (1896) (Henga, Nyassaland, I. II.); Lanz, *Iris* IX. p. 142 (1896) (Tanganika); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 238. n. 35 (1899) (Angola; Omrora; Mashonaland; Manicaland; Nyassaland; Mero See; Tanganyika; Ussure; Brit. E. Afr.).

*Charaxes pelias* Cr. (*sic!*), var. *tanganika* Robbe, *Ann. Soc. Ent. Belg.* XXXVI. p. 133 (1892) (Tanganyika).

♂ ♀. *Body above* in ♂ olive black, russet or wood brown in front, in ♀ all russet, four dots on head, a line behind eye, and two dots at each side of prothorax, white; *underside* varying from greyish white to drab grey, palpi with a thin white ventro-lateral line in the darker specimens, *upperside* of four posterior femora black with rather dense white scaling, anterior tibia brown above.

♂. *Wings, upperside*, black.—Forewing: basal area with a strong, metallic, greenish or purplish blue gloss, a similar gloss near outer margin, but much feebler; a transverse spot in apex of cell, narrowed behind, generally reaching *R*<sup>3</sup>, white; two white discal spots *SC*<sup>4.5</sup>—*R*<sup>2</sup> 6 mm. from cell, mostly preceded by one or two thin white lines; a postdiscal series of spots parallel to outer margin, curving costad anteriorly, spot *R*<sup>2</sup>—*R*<sup>3</sup> 4 mm. and spot *M*<sup>1</sup>—*M*<sup>2</sup> 3 mm. from outer margin, white, edged with pale blue, especially the posterior ones, spots *M*<sup>2</sup> to internal margin mostly entirely pale blue; a series of white admarginal spots, upper

ones elongate, small, spots  $M^2$ — $SM^2$  merged together to one single, large, patch, all more or less edged with pale blue; fringe white, except at ends of veins.—Hindwing: a pale blue postdiscal band of variable width, upper partitions mostly separated, often obsolete, partitions  $R^3$ — $SM^2$  more or less convex proximally, regularly concave distally, width of band 2 to  $3\frac{1}{2}$  mm. between  $R^3$  and  $M^1$ ; white submarginal dots transverse, with pale blue borders which are in most specimens very heavy and not rarely joined at veins  $M^1$ ,  $M^2$ , ( $SM^1$ ), to the postdiscal band, black bars  $R^1$ — $SM^2$  separating the postdiscal band and the submarginal spots as thin as, or very much thinner than, the submarginal blue and white markings; admarginal interstices  $C$ — $R^3$  creamy white, heavy, separated by the thinly black veins, often with ochreous dots upon the internervular folds, interstices  $R^3$ — $SM^2$  pale blue, mostly with creamy white, longitudinal, subtriangular, small spots at veins, and with ochreous dots in middle, anal one nearly all ochreous; abdominal fold brown, greyish near margin.

*Underside* drab, with a vinaceous tint, shaded with grey except median and a great portion of discal interspaces.—Forewing: cell-bar 2 elongate-ovate, bar 3 represented by two heavy dots, bar 4 somewhat oblique, curved distad in middle, mostly slightly concave near ends, reaching  $M$  midway between  $M^1$  and  $M^2$ , a white spot in apex as above, but a little smaller and often less well-defined; submedian bar  $M^2$ —( $SM^1$ ) about 1 mm. distal of base of  $M^2$ , bar  $M^1$ — $M^2$  generally a little more distal than the lower end of cell-bar 4, but often touching it; median bars  $R^3$ — $SM^2$  gradually 1 or 2 mm. more proximal, bar  $R^3$ — $M^1$   $3\frac{1}{2}$  mm. from base of  $M^1$ , bar  $R^2$ — $R^3$  just in front of it or more proximal, bars  $SC^3$ — $R^3$  5 mm. from cell, with contiguous, white, patches at outside, similar patches often at outside of median  $R^3$ — $M^2$ , but here mostly reduced to a white line; discal bars arched, all black, well marked, with white spots at outside, which are variable in size and distinctness; postdiscal bars represented by patches, patches  $M^1$ — $SM^2$  black, often large, the others brown, halfmoon-shaped, concave proximally, upper ones often obsolete; admarginal spots as above, but not well-defined, more buffish.—Hindwing: basal and subbasal costal bars and subbasal bar  $C$ — $SC^2$  absent, submedian and median bars thinner than those on forewing, both costal bars a little more proximal than the respective bars  $C$ — $SC^2$ , the two lines of bars about parallel, concave distally between  $C$  and  $R^3$  resp.  $M$ , median bars ( $SM^1$ )— $SM^3$  not continuous, at right angles to the veins, or pointing somewhat basad with hinder ends; discal bars regularly arched, black, with heavy, yellowish or greyish olive buff, outer borders, followed by rufous red halfmoons which are distally bordered by the black postdiscal bars, these bars thin, often absent, bar  $R^1$ — $R^2$  often developed to a patch; white submarginal spots small, transverse, not sharply defined as a rule, posterior ones pinkish, submarginal black bars  $C$ — $R^3$  thin, often obsolete, bars  $R^3$ — $SM^2$  heavier but shorter, with a blue dot at proximal side; admarginal interstices  $C$ — $R^3$  creamy white, the others white only at veins, all with an ochreous spot in middle; thin marginal line drab; fringe white except at ends of veins; anal angle produced, wing triangular; tails slender, acute, upper one 4 mm., second 5 mm. long.

♀. *Wings above*.—Forewing: brownish black, basal area hazel tawny; a triangular patch in apex of cell, a discal and a postdiscal band of interstitial patches buff yellow; the discal patches  $R^3$  to internal margin large, often contiguous, patch  $R^3$ — $M^1$  the smallest of them, spot  $R^2$ — $R^3$  more proximal, small, often absent, spots  $SC^{4,5}$ — $R^2$  about 5 to 6 mm. from cell, contiguous, or very slightly separated, mostly



with one or two thin lines in front; the postdiscal spots all well separated, spot R<sup>1</sup>—R<sup>2</sup> 5½ mm. and spot M<sup>1</sup>—M<sup>2</sup> 6 mm. from outer margin, the series curving costad anteriorly, on the whole almost parallel to outer margin stopping at M<sup>2</sup>, spot M<sup>2</sup>—(SM<sup>1</sup>) seldom vestigial; admarginal spots all large, dull ochraceous rufous, often paler in middle, spot M<sup>2</sup>—SM<sup>2</sup> shaded with bluish white at proximal edge.—Hindwing: basal area rather paler than base of forewing, abdominal fold grey, blackish outwardly, with a grey, ill-defined, rather small patch before anal angle; a black or dark brown median patch C—R<sup>1</sup>; discal band of forewing continued to (SM<sup>1</sup>), tapering behind, outer edge more or less sinuate between R<sup>2</sup> and M<sup>2</sup>, crossing R<sup>3</sup> proximal of bent; white submarginal spots transverse; upper ones sometimes obsolete, all shaded and edged with pale blue, this blue scaling extended to patches between R<sup>3</sup> and SM<sup>2</sup>; admarginal interstices as prominent as in ♂, interstices C—R<sup>3</sup> orange buff, the others greenish blue, with an orange buff spot upon internervular fold; submarginal bars rather deeper black than disco-submarginal area, bars M<sup>1</sup>—SM<sup>2</sup> more or less isolated, often reduced to mere dots; discal bar C—SC<sup>2</sup> sometimes vestigial within discal band.

*Underside* : spot in apex of cell of forewing, and discal band of patches of both wings creamy white, disco-submarginal area of forewing and submarginal area of hindwing shaded with grey.—Forewing : interstitial patches smaller than above, spot in apex of cell often small, shaded with drab, postdiscal interstitial spots reduced to lunules, middle ones creamy white, double one  $M^2-SM^2$  grey ; postdiscal bars  $M^1-SM^2$  represented by three black, triangular, patches, the last two contiguous, the other postdiscal bars represented by clayish, indistinct, patches ; no admarginal spots, or only vestiges of them.—Hindwing : discal interstitial band much narrower than above, costal median bar in front of median bar  $C-SC^2$  ; admarginal interstitial markings  $C-R^3$  rufous orange,  $R^3-SM^2$  olive buff with gallstone yellow centres ; tails less slender than in ♂, upper one slightly spatulate, length 6 to 7 mm. and  $5\frac{1}{2}$  to  $6\frac{1}{2}$  mm. respectively.

Length of forewing: ♂, 29—35 mm.

“ “ ♀, 31—40 mm.

Clasper as in *Ch. etheocles*, apical lobe short ; penis with a ventro-lateral tooth, not ridge, from this tooth a series of small teeth extends dorsad as in *etheocles* ; tenth tergite triangular, rather produced mesially.

*Hab.* Angola; German S.W. Africa; Manicaland; Mashonaland; Nyassaland; Tanganyika; German and Brit. East Africa. In the Tring Museum 33 ♂♂, 7 ♀♀ from : Angola : Bolombo R. 28. iv., 8. v., 24. vi. '98 (Peurice), Calweha R., 1. v., 15. v. '98 (Peurice), Cubal R., ii. and ii., '99 (Peurice), Kuhiriri R., xi. '99 (Peurice); Nambooma, Upper Zambesi, iv. '98 (Coryndon); Arlington, near Ft. Salisbury, ii. '95 (Coryndon); Blantyre; Ft. Abercorn, Nyassaland; Zomba, xii. '95 (Dr. Rendall); Chipaika Estate, Bandawe, Nyassaland, 3. v. '99 (Watkinson); Mineni Valley, Manicaland, 9. and 13. iii. (Selous); Ruanda, Tanganyika, 23. xi. '93 (Dr. Ansonge); Magwangware, 15. i. '94 (Ansonge); Parumbira, 24. x. '93 (Ansonge).

In one ♂ the costal submedian and median bars of the underside are absent, as in *Ch. achaemenes*.

The remaining allies of *Ch. guderiana* with "black" males are a puzzle to Lepidopterists. The authors who have had to deal with them were startled by the great differences between the numerous forms of the female sex, while they vainly endeavoured to discover constant distinguishing characters between the various

*males*, and hence were inclined to express, more or less tardily, doubts about the number of distinct species being really so large as some authors accepted it to be. Only Dr. Butler speaks with great confidence on the question. He tells us more than once that there is no great difficulty either in distinguishing certain species which others had not recognised, or in mating the sexes correctly. However, in looking over Dr. Butler's various lists of African Butterflies and his Revision of the genus *Charaxes*, it will be noticed that sometimes individuals which Dr. Butler pronounced in one place to belong undoubtedly to one species are, in another paper, referred to a different one. The question of mating and distinguishing the *males* can, therefore, hardly be so easy to solve as Dr. Butler thinks it to be. In fact, it will be seen further on that, for instance, the *males* which Dr. Butler calls *rosae* in his Revision belong partly to *ethalion*, while his *males* of *viola* are not at all the *males* of this form. To show the difficulties that meet here the classifier we mention that eighteen names have been bestowed on the insects under consideration, and that Dr. Butler, in 1896, enumerated these *Charaxes* as ten distinct species (five of which have Dr. Butler as author), while Aurivillius, in 1899, treated them as belonging to six species, of which he did not venture to give distinguishing characters except in the *female* sex. Moreover, "it is singular," as Dr. Butler says, *l.c.*, "that even careful Lepidopterists have agreed in regarding two distinct *females* as sexes in more than one instance." It is indeed surprising that Hewitson (*phaeus*, *cedreatis*), Butler (*alladinis*), Dewitz (*alladinis*), Trimen (*phaeus*), and Standinger (*chiron*) all blundered in describing a *female* as a *male*. But, to us, this shows only that great care should be exercised before one confidently expresses any opinion on these insects.

We are sorry to say that it was the long time we spent on the study of *Charaxes ethalion* and allies and the tawny Indian *Charaxes* which has prevented the speedy publication of this monograph.

Negative results are seldom satisfactory. And almost entirely negative would be the results of our researches in the present group of forms of *Charaxes*, if we considered it the aim of the Lepidopterist merely to find constant distinguishing characters between forms which appear to him to represent distinct species. Very positive and hence satisfactory, however, we find our results, if we regard them from the higher standpoint of the systematist who searches for the degree of blood-relationship of the forms, and of the biologist who wants reasonable explanations of great differences in closely allied insects and of similarities in forms which are not so nearly related.

By comparing a very large material and dissecting a great number of *males* from different localities—there are over 220 ♂♂ in the Tring Museum, about half of which we have examined as to their sexual organs—we feel justified in regarding it as a fact that only two kinds of *males* are constantly distinguishable. And from this **fact** we draw the **conclusion** that there are neither ten, nor six, but only two distinct species, the one (*ethalion*) occurring only in East Africa, from Natal to Taveta and most likely farther north, while the second (*etheocles*) inhabits the whole of tropical Africa from Senegambia and Abyssinia to Damaraland, Transvaal, and Delagoa Bay; the former is relatively constant in both sexes, and the latter is polymorphic in either sex, but especially in the *female*.

This result, we confess, is not in accordance with our anticipation. We thought that close researches would show that there were three distinct forms of *males* (not connected by intergraduate specimens): namely (1) *viola* in Senegambia, Abyssinia and East Africa in two subspecies (*viola* and *kirkii*), (2) *ethalion* in

East Africa from Natal to Brit. E. Afr., and (3) *etheocles* all over tropical Africa, except the north and south, in numerous individual varieties. However, the Senegalese *viola* males are, as we have found, not always distinguishable from certain East African examples, and these are gradually connected by intermediate specimens with *etheocles* males. Hence we do not see that there is any justification in classifying these insects as more than two species, *ethalion* and *etheocles*.

The polymorphism, or better, the polychromatism, in the *female* sex of *Ch. etheocles* is astonishingly great, but does not surpass that of certain other *Nymphalidae*, or of *Papilionidae*.

The variously coloured *females* of *etheocles* can be grouped according to the pattern of the upper surface into six main forms, these forms being :

- (1) similar to the ♀♀ or ♂♂ of the many other *Charaxes*, for instance, *ameliae* and *imperialis* ;
- (2) similar to the *male etheocles*, the white markings of the upperside having almost entirely disappeared ;
- (3) similar to the ♀♀ of *Ch. violetta* and *cithaeron* ;
- (4) similar to the ♀ of *Ch. bohemani* ;
- (5) similar to the ♀♀ of *Ch. tiridates* and *numenes* ;
- (6) similar to the ♂ of *Ch. bohemani*.

If we look upon the *females* of *Ch. etheocles* from this point of view, the polychromatism becomes less perplexing, the acquisition of various patterns in the same species assuming a definite meaning. The pattern of form (1) is the normal one from which the other patterns have been derived; it is very variable. If the more or less great similarity between the *females* of this form and other *Charaxes* is due to all these insects having preserved a pattern which approaches the ancestral one, the agreement between the other forms of *etheocles*-♀ respectively with *bohemani*, *tiridates*, etc., must accordingly be the outcome of parallel development caused, as one is wont to say, by the protection which similarity in colour affords the individuals that associate together. Such an association of *etheocles*-♀ with other similarly coloured *Charaxes* is a **fact** observed first by Selous ; but we have very little further information on this point. It need scarcely be mentioned that in a group so difficult to deal with as the present one mistakes as to identification are hardly avoidable ; for this reason the lists of captures are not wholly reliable, and hence there is some difficulty in ascertaining the geographical distribution of the various forms. So much, however, is certain that the various ♀-forms of *Ch. etheocles* have not the same distribution. In this respect it is very interesting to note that, for instance, the ♀-form called *cedreatis* is found only in West Africa, where *Ch. tiridates* occurs commonly, the *female* of which it resembles, and that the forms agreeing in appearance with the sexes of *Ch. bohemani* are also restricted to the area inhabited by this species ; the *females* of form (3) do also not seem to go farther north than the Congo, occurring commonly in East and South-West Africa ; while the form (1), which is the only one met with in the coast districts of Sierra Leone, is apparently very rare in the Congo basin. The ♀-form *kirki* found in British and German East Africa has no representative in West Africa except in Senegambia. It is evident that there is an important geographical element in the variation of *Ch. etheocles*, but the data available do not allow us to differentiate more than two subspecies of *Ch. etheocles*, the one which inhabiting Senegambia and the **Hinterlands** of Sierra Leone, Gold Coast, Niger and probably of the Cameroons (*Ch. etheocles viola*) is monochromatic



in either sex, while the other found in the other districts of tropical Africa is very variable (*Ch. etheocles etheocles*).

Dr. Butler, in his Revision of *Charaxes*, mentions also seasonal variation. But that was merely a guess; we have no evidence whatever that the individuals treated as such by Dr. Butler are seasonal varieties. On the other hand we know that series of individuals of the male sex caught at the same place on the same day exhibit considerable differences.

*Ch. etheocles* has been bred by Dr. Junod.

n°. Hindwing above in ♂ without a heavy postdiscal band.

7. Penis with a ventral series of teeth; ♀, a series of discal and a series of postdiscal spots on forewing, the posterior discal ones enlarged, no spot in apex of cell.

### 73. *Charaxes ethalion* (Nov. Zool. VII. t. 12. f. 4. 6. ♀).

*Charaxes ethalion* Boisduval, in Delegorgue, *Voy. Afr. Austr.* II. p. 593. n. 83. ♀ (1847) (Pt. Natal); Butl., *Proc. Zool. Soc. Lond.* p. 625. n. 15 (1865) (Zulu; Pt. Natal); Gooch, *Entom.* XIV. p. 6. (1881) (Natal); Trim. & Bowk., *S. Afr. Butt.* I. p. 342. n. 114 (1887) (Cape Colony; Caffraria; Natal; Delagoa Bay); Butl., *l.c.* p. 255. n. 15 (1895) (Zomba); id., *l.c.* p. 720. n. 10 (1895). (Zomba); id., *Journ. Linn. Soc. Lond.* XXV. p. 362. n. 31 (1896) (pt.; Caffraria; Natal; Zulu; Delagoa B.; Zomba); id., *Ann. Mag. N. H.* (6). XVIII. p. 68. n. 5 (1896) (Nyassaland); Staud., *Iris* IX. p. 218 (1896) (Natal; Nguru; Germ. E. Afr.); Dist., *Ann. Mag. N. H.* (7) I. p. 51 (1898) (Barberton).

*Nymphalis erithalion* Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* t. 48. f. 1 (1850).

*Nymphalis ethalion*, id., *l.c.* p. 309. n. 21 (1850) (Pt. Natal; Zulu); Trim., *Rhop. Afr. Austr.* p. 170. n. 98. and p. 340 (1862-66) (Pt. Natal); *Science Gossip* p. 281 (1883).

*Nymphalis erythalion* (!), Lucas, in Cheny, *Enc. d'Hist. Nat., Pap.* p. 152. f. 267 (1851-53).

*Nymphalis ephyra*, Trimen, *Rhop. Afr. Austr.* p. 340 (1866); Kirby, *Cat. Diurn. Lep.* p. 269. n. 22 (1871) (pt.; Natal).

*Charaxes ephyra*, Staudinger, *Exot. Tagf.* p. 170. t. 58. ♂ (1886) (pt.; Natal); Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 192. n. 56 (1894) (sub syn.).

*Charaxes etheocles* var. *ethalion*, Aurivillius, *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 237. sub n. 34 (1899).

♂. *Charaxes rosae* Butler, *Journ. Linn. Soc. Lond.* XXV. p. 360. n. 25 (1896) (pt.).

♂. *Wings* short, broad.—*Upperside* velvety black, with very little metallic gloss.—*Forewing*: blue spot in cell seldom marked, one discal spot near costa, also pale blue, often absent, one postdiscal dot of the same colour, often wanting, seldom followed by a second dot.—*Hindwing*: postdiscal greenish lunules seldom vestigial; admarginal spot C—SC<sup>2</sup> not marked, the next three either rufous red or greenish olive buff, sometimes very faint, posterior ones yellowish olive buff, often very thin; submarginal white and blue dots small, upper ones vestigial or absent.

*Underside* clayish fawn colour, often with a vinaceous flush, rather uniform in colour, the discal interspaces being very little paler.

♀. Resembling *Ch. eth. etheocles* ♀-f. *etheocles*.—*Upperside*, forewing: discal patches larger than the postdiscal ones, the two series widely separated down to M<sup>2</sup>, seldom only to R<sup>3</sup>, the upper spots yellowish or white, the last patches white, more or less edged and shaded with blue, occasionally quite pale blue; discal spot R<sup>2</sup>—R<sup>3</sup> vestigial or absent; patch at internal margin 8 to 12 mm. long; posterior postdiscal spots mostly very small; no spot in cell; no marginal spots.—*Hindwing*: a broad discal band, white, much shaded with pale blue or all pale blue, extending to base of M<sup>2</sup> and beyond bent of R<sup>3</sup>, externally somewhat convex; admarginal spots SC<sup>2</sup>—R<sup>3</sup> bright rufous.

*Underside*, proximal portions of discal interspaces more or less white, these



white patches often absent from hindwing and occasionally obscure also on forewing; ground varying in tint from clay colour to clayish drab.—Forewing: postdiscal interspaces  $M^2$ — $SM^2$  mostly white, the other postdiscal interspaces less pale, not so prominent as in ♀-f. *etheocles*; submarginal interspaces  $M^2$ — $SM^2$  greyish white, forming a patch which resembles the number 3, the other submarginal interspaces less pale, not strongly arched; black postdiscal double patch  $M^2$ — $SM^2$  as in ♀-f. *etheocles*, but the preceding patches not so well marked as in that form.—Hindwing: postdiscal bicolourous halfmoons smaller than in ♀-f. *etheocles*, the postdiscal bars at their distal side not enlarged to patches.

There are four principal forms of the ♀-sex according to the development of the band of the upperside:

- a. Discal and postdiscal spots and band white, shaded with blue.
- b. Upper spots of forewing buff.
- c. Discal and postdiscal spots  $R^3$ — $M^2$  not completely separated (Pl. XII. f. 4). Chipaika Estate, Bandawe, Nyassaland, 17. iv. '99.
- d. Band and spots pale blue (Pl. XII. f. 6), except upper postdiscal spots. Taveta (July); Zambesi.

Forms *a* and *b* are the ordinary ones which are in the Tring Museum from Natal, Nyassaland, Delagoa Bay, and Taveta.

Length of forewing: ♂, 29—35 mm.

” ” ♀, 38—42 mm.

The penis differs from that of *Ch. etheocles* constantly in the series of teeth not turning towards the upperside, but remaining ventro-lateral (Pl. VIII. f. 19), the most distal teeth are, therefore, not visible in a view of the penis from the right side.

*Hab.* Cape Colony, Natal to British East Africa. In the Tring Museum 32 ♂♂, 14 ♀♀ from: Natal, Pinetown (♂♂, ♀♀); Rikatla, Delagoa Bay (♂♂, ♀♀); Lauderdale, Bandawe, Zomba (xii.), Nyassaland (♂♂, ♀); Chipaika Estate, Bandawe (F. Watkinson); Tanganyika (♂♂); Dar-es-Salaam (♂); Taveta, vi. vii. (♂♂, ♀♀); Kibwezi, Brit. E. Afr., 7. iv. '94 (♂) (Dr. Ansonge).

“I met with this interesting *Charaxes*,” says Dr. Trimen, *loc.*, “sparingly at Port Natal in January and February 1867, but succeeded in capturing female examples only. One of the latter was seated quite on the bare ground, and had evidently only just emerged from the chrysalis. I was attracted to the spot by seeing her flutter downward from a neighbouring tree. Colonel Bowker found both sexes on the wing in the same locality in August 1878. I believe that I noticed a ♂ in the edge of the wood at Knysna, in the Cape Colony, as long ago as 1858, and Mr. Streatfeild, C.M.G., informed me that he took the species in the George district in 1877, and in Kaffraria Proper in 1878.”

7. Penis with the series of teeth turning dorsad distally; ♀, forewing above with white band curved, or basal area blue, or band as in *ethalion*, but cell with apical spot.

74. *Charaxes etheocles* (Nov. Zool. VI. t. VIII. f. 6. ♂. 7. ♀; and Nov. Zool. VII. t. 12. f. 5. 7. 8. ♀♀).

♀. *Papilio Eques Achivus etheocles* Cramer, *Pap. Exot.* II. p. 34. t. 119. f. D. E (1777).

♂. *Nymphalis ephyra* Godart, *En. Méth.* IX. p. 355. n. 18 (1823).

♂. *Body above* olive black, with a greenish tint, white dots on head and pronotum prominent; *below* varying from clayish buff to creamy white.

*Wings, upperside* : black, often with a distinct greenish tint, especially in basal area.—*Forewing* : a spot in apex of cell, one to three discal ones  $SC^4-R^3$  about 6 mm. from cell, spot  $SC^6-R^1$  the largest, a postdiscal series of dots parallel to outer margin, upper two larger and more proximal, all these spots grey blue, postdiscal ones generally more white, the number of these spots variable, sometimes all wanting, while in other examples the postdiscal series is complete reaching to  $SM^2$ , occasionally there is also a discal dot  $R^3-M^1$  marked ; outer margin with or without bluish grey or greenish grey markings, which vary much in size and distinctness.—*Hindwing* : a series of postdiscal lunules from  $R^1-(SM^1)$ , bluish grey, or glossy green, seldom with a russet tint, varying from being very distinctly marked to being scarcely traceable ; white submarginal dots shaded at edges with pale green, last two with pale blue ; admarginal interspaces greenish grey, more or less distinct, sometimes vestigial only, interspaces  $SC^2-R^3$  mostly with a rufous bar.

*Underside* : ground colour varying from greyish white to russet, often vinaceous, mostly with an obvious silky gloss which assumes a greenish tint in certain lights ; bars of basal half black.—*Forewing* : cell-bar 1 absent, 2 a heavy dot, 3 separated into two dots, 4 oblique, curved distad in middle, reaching M about midway between  $M^1$  and  $M^2$  ; submedian bar  $M^2-(SM^1)$  about 1 mm. distal of base of  $M^2$ , bar  $M^1-M^2$  again 1 to 2 mm. more distal, but always proximal of base of  $M^1$  ; median bar  $M^2-SM^2$  curved distad in middle, similar in shape to cell-bar 4, median bar  $M^1-M^2$  concave distally, or straight,  $\frac{1}{2}$  to 1 mm. more distal than bar  $M^2-SM^2$ , bar  $R^3-M^1$  at right angles to  $R^3$ , again more distal, while bar  $R^2-R^3$  is  $\frac{1}{2}$  to 1 mm. more proximal, median bar  $R^1-R^2$  not continuous with bars  $SC^4-R^1$  ; discal bars regularly concave, upper ones generally less distinct, posterior ones black, postdiscal series parallel to discal one, last bars forming two black patches as a rule, the others are also patch-like, but are less black being generally russet, often vestigial.—*Hindwing* : basal and subbasal costal bars as well as subbasal bar  $C-SC^2$  absent ; submedian and median costal bars a little more proximal than the respective bars  $C-SC^2$ , occasionally united at costal margin to a half-ring ; no bars beyond  $SM^2$  except the median bar ; discal bars regularly concave, postdiscal ones parallel to them, but seldom well marked, postdiscal interspaces accordingly halfmoon-shaped, the greater distal portions rufous red, these red spots very variable in distinctness, the discal bars externally with a greenish or yellowish grey, or yellowish olive buff border, which is often vestigial only ; black submarginal bars  $C-R^3$  transverse, often indistinct, bordered proximally by the white submarginal dots, the following ones appear as black dots to which are joined proximally blue and white spots ; admarginal interspaces  $C-R^3$  more or less conspicuously rufous red, edged at both sides with thin, glossy, greyish white, lines, upper half of interspace  $R^3-M^1$  often of the same colour, interspaces  $R^3-SM^2$  yellowish olive buff ; marginal black line thin ; tails acute, upper one generally somewhat longer than the second.

♀. *Body above* olive black, more russet in front ; *underside* of palpi and breast more or less cream colour, abdomen brownish black, or dark clay colour.

*Wings above* : very variable in pattern, never so black as in ♂, brownish black with a purplish tint, basal half of forewing and nearly the whole hindwing pale tawny olive in one form.—*Forewing* : a series of discal and another of postdiscal interstitial spots paler than the ground colour, white, buff, tawny olive, or blue, a spot in apex of cell white or buff or pale blue ; the discal spots from  $R^2$  to internal margin and the cell-spot often forming a continuous, curved, band.—*Hindwing* : with a white, pale blue, or buff band across disc, or without a band ; white sub-

marginal spots mostly larger than in ♂; admarginal interspaces also generally larger, their colour variable, anal one (sometimes the last three) of an olive buff tint, the others more or less tawny orange, this colour sometimes restricted to interspaces C—R<sup>3</sup>, which occasionally are much shaded purplish black.

*Underside*: bars essentially as in ♂, median bars R<sup>2</sup>—M<sup>1</sup> of the forewing mostly absent in the specimens with a curved band; discal and postdiscal interspaces of forewing and the median and discal ones of hindwing paler than in ♂; often a discal band of a bluish white or buffish white colour present; tails longer than in ♂, less acute, upper one often spatulate, sometimes truncate.

Length of forewing: ♂, 30—40 mm.

" " ♀, 35—44 mm.

Clasper narrowed into a concave lobe (Pl. VIII. f. 33. 34. 35) which is very little curved mesiad, the armature being formed by a sharp long tooth into which the ridge is produced that runs from the ventral edge of the apical lobe to the inner surface of the clasper, this tooth has a ventral position, it projects mesiad and is, therefore, best seen in a dorsal (f. 35), or ventral view (f. 33); tenth tergite not divided, rounded triangular; penis-funnel (f. 45, 46) short, broad, free portion triangular, extreme tip compressed, forming a short, sharp, hook; penis with a triangular, dextro-lateral ridge ventrally about 2½ mm. before the end, this ridge is variable in height and outline, always more or less dentate, an irregular series of teeth of variable size runs on the left side of the penis, from the ridge obliquely towards the dorsal side of the penis, the series ending about ½ mm. before the tip (Pl. VIII. f. 12—18), number, size, and position of teeth variable, the ridge and the portion of side of the penis immediately before it often rugate and rather densely denticulated, while in other individuals this portion is smooth and the series of teeth is regular; but this difference is individual only.

*Hab.* All over Africa south of the Sahara, except Cape Colony and Natal. In the Tring Museum over 220 ♂♂, and 48 ♀♀.

We distinguish two subspecies: *Ch. etheocles etheocles* and *Ch. etheocles viola*.

#### a. *Ch. etheocles etheocles*.

- ♀. *Papilio Eques Achirus etheocles* Cramer, *Pap. Ex.* II. p. 34. t. 119. f. D. E. (1777) Sierra Leone; Goeze, *Ent. Beytr.* III. 1. p. 85. n. 59 (1779); Fabr., *Spec. Ins.* II. p. 12. n. 46 (1781) (Afr. occ.); id., *Mant. Ins.* II. p. 6. n. 51 (1787); Herbst, *Naturs. Schmett.* IV. p. 71. n. 157. t. 65. f. 3. 4 (1790); Gmel., *Syst. Nat.* I. 5. p. 2234. n. 299 (1790).
- ♀. *Papilio Nymphalis etheocles*, Fabricius, *Ent. Syst.* III. 1. p. 64. n. 200 (1793) (syn. pro parte).
- ♀. *Eriboea etheoclessa* (!), Hübner, *Verz. bek. Schmett.* p. 47. n. 431 (1816-27).
- ♀. *Nymphalis etheocles*, Godart, *Enc. Méth.* IX. p. 355. n. 17 (1823); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 308. n. 7 (1850) (pt.); Kirby, *Cat. Diurn. Lep.* p. 269. n. 21 (1871).
- ♂. *Nymphalis ephyra* Godart, l.c. p. 355. n. 18 (1823) (Afr. occ.; pt.); Doubl., Westw. & Hew., l.c. p. 308. n. 8 (1850) (pt.); Kirby, *Cat. Diurn. Lep.* p. 269. n. 22 (1871) (pt.); Mab., *Bull. Soc. Zool. Fr.* I. p. 280 (1876) (Congo; synonym. ex parte); Dewitz, *Nor. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 8. n. 28 (1879) (N. Angola).
- ♀. *Charaxes etheocles*, Thon, *Naturg. Schmett.* p. 74. t. 37. f. 547. 548 (1837); Butl., *Cat. Diurn. Lep. descr. by Fabr.* p. 52. n. 9 (1869) (pt.; *ephyra* = ♂ of *etheocles*?); Capronn., *C. R. Soc. Ent. Belg.* XXXIII. p. 125. n. 69 (1889) (Kassai).
- ♀. *Charaxes etheocles* (!), Butler, *Proc. Zool. Soc. Lond.* p. 629. n. 23 (1865) (pt.).
- ♂. *Charaxes ephyra*, Butler, l.c. p. 629. n. 24 (1865) (pt.); Plötz, *Stett. Ent. Zeit.* XLI. p. 194. n. 106 (1880) (Cameroons; VIII. XII.); Staud., *Exot. Tagf.* p. 170 (1886) (pt.; Gold Coast; Gaboon; Angola); Capronn., l.c. p. 146. n. 79 (1889) (Gaboon); Godm. & Salv., *Proc. Zool. Soc. Lond.* p. 440. n. 85 (1890) (Aruwimi); Trim., *ibid.* p. 80. n. 36 (1891) (S.W. Afr.:



- Ebanda VIII. IX.; small); Auriv., *Ent. Tidskr.* XII. p. 215. n. 139 (1891) (Cameroons); Trimen, *l.c.* p. 43. n. 67 (1894) (Manica, III.); Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 192. n. 56 (1894) (pt.); Auriv., *l.c.* XV. p. 311. n. 194 (1894) (Cameroons, III. V. XI.; *ephyra* = ♂ of *etheocles*?).
- ♀. *Charaxes ephyra*, Butler, *Ent. Mo. Mag.* XI. p. 57 (1874) (♀, Gold Coast; distinct from *ethalion*!).
- ♂ ♀. *Charaxes etheocles*, Trimen, *l.c.* p. 80. note (1891) (*etheocles* = ♀ of *ephyra*); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 359. n. 24 (1896) (Lagos; Gold Coast; Cameroons; Congo); Staud., *Iris* IX. p. 218 (1896); id., *l.c.* p. 363. t. 3. ♀ ♀ (1896); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 237. n. 34 (1899).
- ♀. *Charaxes alladinis* Butler, *Cist. Ent.* I. p. 5 (1869) ("♂" ex err.!!; hab.?).; id., *Lep. Exot.* p. 27. n. 5. t. 10. f. 2 (1870) ("♂" ex err.); Dewitz, *Nov. Act. Leop. Car. Ak. Naturf.* L. 4. p. 371. t. 17. f. 8. ♀. 9. ♀ (1887) (fig. 8 "♂" ex err.!!; N. Angola).
- ♀. *Nymphalis alladinis*, Kirby, *Cat. Diurn. Lep.* p. 269. n. 23 (1871).
- ♀. *Charaxes cedreatis* Hewitson, *Ent. Mo. Mag.* X. p. 247 (1874) (W. Afr.; "♂" ex err.!!); id., *Exot. Butt. V. Charaxes* t. 5. f. 22. 23. 24 (1876).
- ♀. *Charaxes phaeus* Hewitson, *l.c.* XIV. p. 82 (1877) (Del. Bay; "♂" ex err.!!); Trim. & Bowk., *S. Afr. Butt.* I. p. 344. n. 115 (1887) ("♂" ex err.); id., *l.c.* III. p. 408 (1889); Monteiro, *Delagoa B. t.* 1. f. 4 (1891); Trim., *Proc. Zool. Soc. Lond.* p. 43. n. 68 (1894) (Manica, IV.); Lanz, *Iris* IX. p. 143 (1896) (Tabora); Auriv., *l.c.* p. 236. n. 28 (1899) (Del. Bay; Nyassaland; L. Mero; Tabora).
- ♀. *Charaxes kirki* Butler, *Ent. Mo. Mag.* XVIII. p. 105 (1881) (Mamboia).
- ♂ ♀. *Charaxes carteri* Butler, *l.c.* p. 108 (1881) (Accra); Godm. & Salv., in Jameson, *Story Rear Column* p. 440. n. 86 (1890) (Nkalama R., IV.).
- ♂ ♀. *Charaxes ephyra* var., Dewitz, *Nov. Act. Leop. Car. Ak. Naturf.* L. 4. p. 371. t. 17. f. 10. ♂. 11. ♀ (1887) (N. Angola).
- ♂. *Charaxes kirki* Butler, *Proc. Zool. Soc. Lond.* p. 60. n. 17 (1888) (Foda, X.); id., *Ann. Mag. N. H.* (6). VII. p. 42. n. 12 (1891) (Kandera, Germ. E. A., X.).
- ♂. *Charaxes alladinis* Butler, *Proc. Zool. Soc. Lond.* p. 648. n. 19 (1893) (Brit. C. Afr., I. VIII.).
- ♀. *Charaxes manica* Trimen, *Proc. Zool. Soc. Lond.* p. 43. n. 69. t. 4. f. 9 (1894) (Manica); Butl., *ibid.* p. 822. n. 13 (1896) (Songwe Valley, III.; Deep Bay, VII.).
- ♂ ♀. *Charaxes hollandi* Butler, *Ann. Mag. N. H.* (6). XII. p. 266 (1893) (S. Leone); id., *Journ. Linn. Soc. Lond.* XXV. p. 362. n. 30 (1896) (S. Leone; O. Calabar).
- ♀. *Charaxes rosae* Butler, *Proc. Zool. Soc. Lond.* p. 255. sub n. 16 (1895) (Delagoa B.); Lanz, *Iris* IX. p. 143 (1896) (Tanganyika).
- ♀. *Charaxes dewitzi* id., *l.c.*
- ♂. *Charaxes phaeus*, Butler, *l.c.* p. 255. n. 16 (1895) (Zomba); id., *l.c.* p. 852. n. 13 (1896) (Nyassaland).
- ♂ ♀. *Charaxes phaeus*, id., *Journ. Linn. Soc. Lond.* XXV. p. 361. n. 27 (1896).
- ♂ ♀. *Charaxes chanleri* Holland, *Proc. U. St. Nat. Mus.* XVIII. p. 262. ♂. p. 753. ♀ (1895) (Brit. E. Afr.).
- ♂. *Charaxes ephyra* var. *phaeacus* Staudinger, *Iris* IX. p. 216 (1896) (Germ. E. Afr.; Niam Niam).
- ♂. *Charaxes ephyra* ab. *catochrous* id., *l.c.* p. 218 (1896) (Cameroons).
- ♂. *Charaxes hollandi*, Sharpe, *Proc. Zool. Soc. Lond.* p. 533. n. 34 (1896) (Walenso, Somaliland, X.).
- ♂ ♀. *Charaxes fulgurata* Aurivillius, *Kongl. Sv. Vet. Ak. Handl.* XXX. 1. 5. p. 236. n. 30 (1899) (Angola).

As we must regard, according to our researches on the dead specimens, the individuals occurring in the same place so closely related as if they were the immediate offspring of the same mother individual, there is no justification in maintaining that a certain *male* of that series of individuals is the mate of one certain form of *female*. Unless there is evidence to the contrary, we have to assume that the individuals of the same place copulate indiscriminately. The Angola ♂ figured by Dewitz, for instance, is not the mate of only one of the three Angola ♀♀ represented on the same plate, but of all three. Hence we consider it wrong to apply the same varietal name for the ♂ and one of those ♀♀, and other varietal names for the remaining two ♀♀. Such a nomencla-



ture is, moreover, very misleading, if employed in lists of captures, because the use of the same name for a certain ♂-form and for a certain ♀-form obscures the geographical distribution of the varietal forms. For instance, "*alladinis*" is recorded by Butler in his Revision from Lagos, Cameroons and Gaboon; the form inhabits most likely these places, but all the specimens mentioned from there by Butler are *males*, while *alladinis* is the name of a certain kind of *female*. Therefore the record of *males* is no evidence that the particular ♀ "*alladinis*" occurs in Lagos, Cameroons and Gaboon. What we want is a precise knowledge of the distribution of the ♀-form *alladinis*, and this knowledge will not be furthered by employing the name *alladinis* for something that is not the ♀-form *alladinis*. Therefore, in the following synopsis a name employed for a ♂-form will not be used again for a ♀-form.

♂. Variable; transitions between the different forms numerous; form 4 is apparently the most constant of all.

A. Forewing *above*: marginal greenish grey or bluish grey spots large; at least two postdiscal spots.

a. Forewing *falcate*, *above* with more than two postdiscal spots, the spots not deeply arched; the series mostly consisting of five to eight spots; admarginal spots SC<sup>2</sup>—R<sup>3</sup> of hindwing *above* rather large, greenish grey, with red centres; postdiscal pale bluish green lunules of same wing often heavy, sometimes vestigial. Discal spots R<sup>2</sup>—M<sup>1</sup> of forewing *above* more or less marked (type), or absent. Reminding one of *guderiana*, but the broad, pale blue, postdiscal band of the hindwing of the latter species consists in the present form of lunules, which are, at the utmost, 1 mm. broad.

1. ♂-f. *picta* Rothsch., f. nov.

We possess this form, which seems to be confined to East Africa, from: Unyoro: Kitanwa, 9. x. '97 (*type* !); Fajao, 25. xi. '97; Kasokwa, 25. viii. '97 and 5. x. '97; Warringo River, 8. and 9. vii. '97; Wakibara, 23. vii. '97; Kiorbezi, 4. i. '98; Kikoyero, 31. iii. '97; Hoima, 23. viii. '97; Fovira, 9. v. '97; Busilika, Bulamwezi, 11. ii. '98; Karunga, Kyanika, Bulamwezi, 20. iii. '97.—Quilimane, Portug. E. A., 23. vii. '93.—A long series, collected by Dr. Ansorge.

b. Forewing *above* with more than two postdiscal spots, but the spots forming deeply arched, greenish, halfmoons, the horns of which reach the marginal spots.

2. ♂-f. *fulgurata*.

*Ch. ephyra* var., Dewitz, l.c. t. 17. f. 10 (1887).

*Ch. fulgurata* Aurivillius, l.c.

c. Forewing *above* with two postdiscal spots; hindwing *above* with the postdiscal spots SC<sup>2</sup>—R<sup>3</sup> heavily red in many specimens; *underside* varying from whitish grey to greyish clay colour; generally somewhat smaller than the form *picta*, sometimes (Angola specimen) resembling in shape *Ch. ethalion*.

3. ♂-f. *chanleri*.

*Ch. chanleri* Holland, l.c.

*Ch. ephyra* var. *phaeacus* Staudinger, l.c.

In the Tring Museum from: Unyoro, Fajao, 15. and 20. vii. '97, Warringo R., 8. vii. '97 (Dr. Ansorge); Somaliland: Walenso, Sheik Husein, Upper Shebeli R., 5 to 7000 ft., wet country, 26. x. '94 (Dr. Donaldson Smith). German E. Afr:

Dar-es-Salaam. Rhodesia : Nambooma, Upp. Zambesi, beginning of April 1898, Njoko, April 1898 (Coryndon). Transvaal : Rustenburg, ix. x. '94 (Ayres). Angola : Cnbal R., iii. '99 (Peirice).

One of the Nambooma specimens is figured in Nov. Zool. VI. t. VIII. f. 6 ; the ♂ individuals from that place, as well as the Njoko example, have the underside very much variegated ; the ♀, figured on the same plate, which Mr. Coryndon obtained in practically the same district, has the *underside* more uniform in colour. Our two specimens from Somaliland, Walenso, are the same in size as ♂-f. *picta*.

*B. Forewing above* : marginal spots small, or absent ; if large, there is only one (or no) postdiscal spot.

*d. Forewing above* with two, rather large, postdiscal spots ; *underside* clayish chocolate, very uniform in colour ; wings broad, resembling in shape those of *Ch. ethalion*, but are larger. 4. ♂-f. *cytila* Rothsch., f. nov.

We received a series of this peculiar form from near Bandawe, Nyassaland, some of them being caught in April, and also a few specimens from Ft. Abercorn, Nyassaland. Together with them came the *female* form represented on Plate XII. f. 7, which has precisely the same underside as regards the tint of the ground colour. Several specimens from Angola, caught by Mr. Peirice (Kuhiriri R. and Longa R., Nov. '99), as well as specimens from Zomba in Mr. Adams's collection, agree on the upperside fairly well with this form, but have the underside flushed with a strong vinaceous tint, the forewing being, moreover, more variegated. With these ♂♂ come two kinds of ♀♀, which are mentioned under forms 12 and 13.

*e. Forewing above* with one or no postdiscal spot, or ground colour of *underside* not uniformly clayish chestnut.

*a*<sup>1</sup>. Basal two-thirds of *underside* almost white. Upperside : forewing with three dots along costal edge, one or the other of them often absent, seldom all wanting ; marginal dots, if marked, very small ; admarginal spots of hindwing not centred red. 5. ♂-f. *catochrous*.

*Charaxes ephyra ab. catochrous* Staudinger, *Iris* IX. p. 218 (1896).

This is the form of which Dr. Butler says : " Mr. Godart's description (of *ephyra*) is sufficiently good to identify the species with certainty." However, Godart's description seems to us to apply much better to form 8.

In the Tring Museum from : Cameroons ; Warri, Niger Coast Protectorate, v. and vi. (Dr. Roth) ; Leopoldville, Congo ; Unyoro : Fajao, 15. and 16. vii. '97, Wakibara, 23. vii. '97, Karunga, Kyanika, Bulamwezi, 20. iii. '97 ; Masindi, 28. vii. '97 (Dr. Ansonge).

*b*<sup>1</sup>. Basal two-thirds of underside not white, the median interspaces always much darker in tint ; discal interspaces of *underside* at outside of median bars and part of submedian interspaces more or less pale clay colour, sometimes almost grey.

*a*<sup>2</sup>. Marginal spots of forewing above absent or small ; ground colour of *underside* broccoli brown. 6. ♂-f. *hollandi*.

*Ch. hollandi* Butler, *l.c.*

A common West African form, occurring from Sierra Leone to the Congo and British E. Africa ; dated specimens in the Tring Museum from : Rau, Nandi country, 14. iii. '98, and Kabras, Uganda Protectorate, 13. xii. '96 (Dr. Ansonge) ; Warri, Niger Coast Protectorate, 22. viii. '97 ; Kumasi to Cape Coast Castle, iv. '99

(Capt. Giffard); Great Forest of Upper Congo, fifteen days' march from Ft. Beni, 19. v. '99 (Dr. Ansorge).

b<sup>2</sup>. Like preceding, but *underside* with an obvious reddish purple tint, especially on the darker coloured portions of the wings.

7. ♂-f. *carteri*.

*Ch. carteri* Butler, l.c.

Also common in West Africa from Sierra Leone to the Upper Congo; intergradations between this and forms 6 to 10 numerous. This is what Dr. Butler puts as ♂ to ♀-f. *alladinis*. Dated specimens in the Tring Museum from Warri, Niger Coast Protectorate, iv. '96 (Dr. Roth); Yanga, Ituri R., 29. v. '99 (Dr. Ansorge).

c<sup>2</sup>. *Underside* as in 6 or 7; *upperside*, marginal spots of forewing conspicuous, white submarginal dots of hindwing large, one postdiscal dot, the second seldom vestigial; admarginal spots of hindwing without red centres.

8. ♂-f. *ephyra*.

*Nymphalis ephyra* Godart, *Enc. Méth.* IX. p. 355. n. 18 (1823).

*Charaxes viola*, Butler (non Butler, 1865), *Journ. Linn. Soc. Lond.* XXV. p. 359. n. 23 (1896) (Ashanti; O. Calabar; Angola).

Distributed over West Africa from Sierra Leone to the Congo basin; resembling the East African forms 1 and 3. In the Tring Museum from: S. Leone (Capt. Stevens); Kumasi to Cape Coast Castle, iv. '99 (Capt. Giffard); Kumasi to Kintampo, iv. '99 (Col. Northcott); Agawasso, Gold Coast, middle of vii. '97; Great Forest on Upper Congo, four days' march from Ft. Beni, 8. v. '99 (Dr. Ansorge).

d<sup>2</sup>. *Upperside*, forewing: spot in cell generally large, the other two costal spots small, the postdiscal one of them mostly absent, marginal spots absent or vestigial, basal area green; hindwing: admarginal spots SC<sup>2</sup>—R<sup>3</sup> more or less ochraceous, or ochraceous rufous. *Underside* dark clay colour, bars heavy.

9. ♂-f. *lutacea* Rothsch., f. nov.

Known to us from the Congo basin and Unyoro. In the Tring Museum from: Lukolele, Stanley Pool; Great Forest, two and three days' march from Ft. Beni, 6. v. '99 and 7. v. '99 (*type*) (Dr. Ansorge); Fajao, Unyoro, 23. vii. '97 (Dr. Ansorge).

e<sup>2</sup>. *Upperside* violet blue; forewing: with or without marginal spots, costal spots sometimes all wanting; hindwing: admarginal spots obscurely marked. *Underside* as in form 6, seldom as in 7.

10. ♂-f. *violacea* Rothsch., f. nov.

In the Tring Museum from: Kumasi to Mansu, Gold Coast, iv. '99 (Col. Northcott); Ogowé R. (*type*); Bopoto, Congo; Sakarumbi, one day's march from Ft. Beni, Congo Free State, 5. v. '99, and three days' march from Ft. Beni, 7. v. '99 (Dr. Ansorge); Yanga, Ituri R., 29. v. '99 (Dr. Ansorge).

Besides these ten forms, which can be subdivided almost infinitely, there exist in collections individuals which agree on the *upperside* with one or the other of forms 5 to 10, but have the ground of the *underside* much more uniform in colour. Two such individuals in the Tring Museum have the *upperside* obviously oily green; the marginal markings of the forewing above and the submarginal dots of the hindwing are as in ♂-f. *ephyra*. A specimen from Buaia, Busiro, Uganda, 24. iii. '99 (Dr. Ansorge), has the shape and size of ♂-f. *chanleri*, the costal

spots of the forewing are obsolete, and the underside is conspicuously flushed with purple red.

Figs. 12 to 17 of Pl. VIII. represent various penis forms : f. 14, Warringo R. = ♂-f. *picta* ; f. 15, Kiorbezi = ♂-f. *picta* ; f. 13, Nambooma = ♂-f. *chanleri* ; f. 12, Bandawe = ♂-f. *cytila* ; f. 16, Wakibara = ♂-f. *catochrous* ; f. 17, Warri, Niger = ♂-f. *catochrous*.

♀. Polychromatic.

A. Forewing *above* with a discal and a postdiscal series of paler spots, or the spots nearly all absent, base not pale blue, no white curved band.

a. Hindwing with a broad discal band across disc, white, buff, blue.

a<sup>1</sup>. Discal and postdiscal patches of forewing merged together, only the upper two or three pairs separated, the band thus formed creamy buff, anteriorly and distally ochraceous ; hindwing with admarginal spots SC<sup>2</sup>—R<sup>3</sup> orange, the following ones olive buff, discal band white, slightly bluish proximally, and with a faint tint of ochraceous at distal edge. *Underside*, discal interspaces white.

1. ♀-f. *kirki*.

(?) *Charaxes viola* Butler, *Ann. Mag. N. H.* (4). XVIII. p. 481 (1876) (Atbara ; *haec forma ?* aut *Ch. etheocles viola ?*).

*Ch. kirki* Butler, *l.c.* (Mamboia).

*Ch. chanleri* Holland, *l.c.* p. 753. ♀ (Brit. E. Afr. ; Kikuyu ?).

Resembling the Senegalese *Ch. etheocles viola*. It is known from British E. Africa (Kikuyu or Kenia district ?), Taveta, May 1891 (Mus. Tring), German E. Africa, Mamboia ; possibly the Abyssinian individuals recorded by Butler, *l.c.*, as *viola* belong here also.

b<sup>1</sup>. Discal and postdiscal patches of forewing more or less joined together, or nearly all separated, ochraceous ; band of hindwing buffish ochraceous or buff, admarginal spots all orange, except anal one. *Underside* flushed with reddish purple, discal and postdiscal interspaces of forewing with buff patches, discal interspaces of hindwing forming a buff coloured band.

2. ♀-f. *ochracea* Rothsch., f. nov.

*Ch. ephyra*, Standinger, *Iris* IX. t. 3. f. 6 (1896) (Gaboon).

Occurs in West Africa : Congo (Mus. Tring).

c<sup>1</sup>. Discal and postdiscal patches of forewing above as before, upper ones buffish, posterior ones white, slightly bluish ; band of hindwing white, and shaded with blue at edges. Resembling ♀ of *Ch. ameliae*.

3. ♀-f. *etheocles*.

*P. E. A. etheocles* Cramer, *l.c.*

*Ch. ephyra*, Standinger, *Iris* IX. t. 3. f. 3, 4 (1896).

A West African form, the commonest in S. Leone ; known from S. Leone, Gold Coast, Cameroons, Gaboon.

d<sup>1</sup>. Like b<sup>1</sup> or c<sup>1</sup>, but the last discal patch of the forewing and the band of the hindwing blue. Resembles *Ch. imperialis* ♀.

4. ♀-f. *regalis* Rothsch., nov.



*Ch. hollandi* Butler, l.c. ♀, non ♂.

*Ch. ephyra*, Staudinger, *Iris* IX. t. 3. f. 5 (1896) (S. Leone).

Occurs on the West Coast : Sierra Leone (*type*), O. Calabar.

*e*<sup>1</sup>. Like ♀-f. *regalis*, but forewing : discal patches blue up to R<sup>2</sup>, post-discal spots (except upper two) absent; hindwing: blue band broader, its outer edge convex, parallel to margin of wing. Transition to the individual of ♀-f. *phaeus* with green base, mentioned below.

5. ♀-f. *dewitzi*.

*Ch. alladinis* Dewitz, l.c. t. 17. f. 8 (1887).

*Ch. dewitzi* Butler, l.c. Angola.

*b*. Hindwing without broad discal band.

*f*<sup>1</sup>. *Upperside* with a red purple gloss ; spots of forewing more or less ochraceous, the discal and postdiscal series both stopping at M<sup>2</sup>, there being no spots beyond this vein, or the external series continued to internal margin ; proximal series often reduced to two or three spots ; hindwing sometimes with a postdiscal line of ochraceous lunules.

6. ♀-f. *seriata* Rothsch., f. nov.

*Ch. ephyra*, Staudinger, *Iris* IX. t. 3. f. 2 (1896) (Gaboön).

In the Tring Museum, from the Gold Coast, R. Ogowé, and the Congo.

*g*<sup>1</sup>. *Upperside* purple blue, spots of forewing white or whitish blue, or purple, hindwing with indications of blue postdiscal patches.

7. ♀-f. *alladinis*.

*Ch. alladinis* Butler, l.c.

*Ch. ephyra*, Staudinger, *Iris* IX. t. 3. f. 1. (1896) (Gold Coast).

In the Tring Museum from the Gold Coast, Lagos and Cameroons.

*h*<sup>1</sup>. Like preceding, but hindwing with two red and blue patches.

8. ♀-f. *fulgens* Rothsch., f. nov. (Pl. XII. f. 5).

In the Tring Museum from Sierra Leone.

*i*<sup>1</sup>. Like form 6, but more steel blue, especially on hindwing, spots of forewing absent, except a small discal costal spot, which is pale blue, and the vestige of a spot in the apex of the cell.

9. ♀-f. *virilis* Rothsch., f. nov.

One specimen without precise locality in the Tring Museum, labelled W. Afr.

*B*. Forewing *above* with a curved, white, band, or basal half of wing pale blue as in *Ch. bohemani* ♂.

*e*. Forewing with white curved band ; basal third of hindwing not pale blue.

*k*<sup>1</sup>. Basal area of forewing and greater part of hindwing tawny olive.

Forewing : patch R<sup>3</sup>—M<sup>1</sup> of band long, patches M<sup>2</sup>—SM<sup>2</sup> small, obsolescent ; of the postdiscal series SC<sup>4</sup>—M<sup>2</sup> of spots only the upper two marked. Resembling ♀ *Ch. tiridates*. 10. ♀-f. *cedreatis*.

*Ch. cedreatis* Hewitson, l.c.

*Ch. carteri* Butler, l.c. ♀.

Hewitson's specimens came from Angola and Fernando Po.

In the Tring Museum from the Gold Coast and the Congo.

*l*<sup>1</sup>. Basal area of both wings brown, with a metallic gloss ; band of hindwing broad, white or pale blue ; hindwing *below* with or without white discal band. 11. ♀-f. *rosae*.

*Ch. alladinis* var., Dewitz, l.c.

*Ch. rosae* Butler, l.c.

In the Tring Museum from Delagoa Bay ; Zomba, xii. '95 (Dr. P. Rendall) ; Taveta, vi. and vii.

d. Basal two-thirds of hindwing pale blue ; forewing with white band.

m<sup>1</sup>. Basal area of forewing brown ; postdiscal markings of forewing angle-  
or halfmoon-shaped. 12. ♀-f. *lunigera* Rothsch., nom. nov.

*Ch. ephyra* var., Dewitz, l.c. t. 17. f. 11.

*Ch. fulgurata* Aurivillius, l.c. ( ♀, non ♂ ).

*Dewitzia*

Found in Northern Angola. Type : Denily's figure.

n<sup>1</sup>. Basal area of forewing blue or greenish blue. Resembling ♀ *Ch.*  
*bohemani*. 13. ♀-f. *manica*, (Plate XII. f. 7).

*Ch. manica* Trimen, l.c.

Received, together with ♂-f. *cytila*, from near Bandawe, Nyassaland, (F. Watkinson) ; Loanda ; Longa R., Angola, Nov. 1899 (Penrice).

o<sup>1</sup>. Band of forewing interrupted at M<sup>2</sup>, patch M<sup>1</sup>—M<sup>2</sup> oblique, blue colour  
more restricted than in the preceding form.

14. ♀-f. *vetula* Rothsch., f. nov. (Pl. XII. f. 8).

In the Tring Museum from the Ogoiré R.

e. Forewing without white band.

p<sup>1</sup>. Basal areas of both wings pale blue, extending on forewing to point of  
origin of M<sup>1</sup>, sometimes greenish at base, in which case the upperside  
comes near that ♀-f. *dewitzi* ; posterior postdiscal spots of forewing  
absent. Resembling ♂ *Ch. bohemani*. 15. ♀-f. *phaeus*.

*Ch. phaeus* Hewitson, l.c. : Monteiro, l.c. t. 1. f. 4 (1891).

Recorded from Delagoa Bay ; Manicaland, April ; Tabora, German E. Africa.

In the Tring Museum from Hikuenge, Loanda, viii., and "Mozambique  
(Monteiro)," the former with the base of the wings greenish ; a third specimen,  
from Angola (Penrice), agrees with that from Hikuenge.

q<sup>1</sup>. Basal areas grey green blue, not violet at edges, extended on forewing  
beyond base of M<sup>1</sup>, joining the postdiscal spots M<sup>2</sup>—SM<sup>2</sup> which are  
not obsolete, postdiscal spots of the same colour, upper two white  
proximally ; a series of minute admarginal dots up to R<sup>2</sup> ; *underside*  
with a strong vinaceous grey flush, markings not prominent.

16. ♀-f. *coryndoni* Rothsch., f. nov. (Nov. Zool. VI. t. 8. f. 7.)

I received this peculiar form, together with the ♂♂ mentioned under ♂-f.  
*chanleri*, from Mr. Coryndon, who found it at Gazungula, Upper Zambesi, in  
April 1898.

#### b. *Ch. etheocles viola*.

♂. *Nymphalis ephyra* Godart, *Enc. Méth.* IX. p. 355. n. 18. "N. B." (1823) (partim).

♂ ♀. *Charaxes ephyra*, Feisthamel, *Ann. Soc. Ent. Fr.* p. 253. n. 10 (1850) (Casamanca) ; Butl.,  
*Proc. Zool. Soc. Lond.* p. 623. n. 24 (1865) (pt.).

♂ ♀. *Nymphalis ephyra*, Kirby, *Cat. Diurn. Lep.* p. 269. n. 22 (1871) (pt.).

- ♀. *Charaxes viola* Butler, l.c. p. 627. n. 16. t. 36. f. 4 (1865) (W. Afr.); Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 187. n. 49 (1894) (Adeli, Togo); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 359. n. 23 (1896) (pt.; W. Afr.).
- ♂ ♀. *Charaxes viola* Butler, *Ann. Mag. N. H.* (4). XVIII. p. 481 (1876) (Atbara; *haec subsp. ?*).
- ♀. *Charaxes chiron* Staudinger, *Exot. Tagf.* p. 168. t. 58 (1886) (Senegal; "♂" ex err.).
- ♂. *Charaxes ephyra*, Karsch, l.c. p. 192. n. 56 (1893) (Adeli, Togo).
- ♂ ♀. *Charaxes etheocles* var. *viola*, Aurivillius, *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 238. sub n. 34 (1899) (pt.).

♂. Small, resembling *Ch. etheocles etheocles* ♂-f. *chanleri*, wings more elongate.—*Upperside*, forewing: cell-spot always present, rather large, discal spot SC<sup>5</sup>—R<sup>1</sup> also heavy, mostly accompanied by a line in front and a dot behind; two postdiscal dots, of which the second is seldom absent, occasionally traces of two more dots; marginal spots large, more or less fused together.—*Hindwing* more triangular than in the other West African specimens of *Ch. etheocles*, admarginal spots rather heavy, spots SC<sup>2</sup>—R<sup>3</sup> paler, often with orange red centres, broader than the space between them and the white submarginal dots; black submarginal dots R<sup>3</sup>—SM<sup>2</sup> obvious on account of their deep black colour; postdiscal line of lunules R<sup>1</sup>—(SM<sup>1</sup>) always present.

*Underside* clayish eern drab, rather uniform in colour, median interspaces scarcely darker than base.

*Underside* of breast, especially of metasternum, as pale as the palpi; abdomen little more buffish.

♀. Resembling *Ch. etheocles etheocles* ♀-f. *kirki*. *Wings above* purplish brown.—*Forewing*: a series of discal and one of postdiscal spots, spots SC<sup>4</sup>—R<sup>2</sup> separate, or spots R<sup>1</sup>—R<sup>2</sup> connected by tawny scales, the others merged together to a band which is cut by the brown veins, the band is 7 to 8 mm. broad at internal margin, is about 5 mm. from outer margin and, at M<sup>2</sup>, 8 mm. from cell, mostly whitish at internal margin; patch R<sup>2</sup>—R<sup>3</sup> often subdivided by brown scales, sometimes the proximal portion absent, patches R<sup>3</sup>—M<sup>1</sup> occasionally also with tawny brown scales in or near middle; outer margin with a series of large, but rather obscurely marked, tawny spots.—*Hindwing*: a broad, white, discal band, posteriorly shaded with pale blue or violet, measuring 6 to 7 mm. at SC<sup>2</sup>, 14 mm. along M<sup>2</sup>, the black postdisco-submarginal area reduced to a band which becomes very narrow behind and measures only 4 mm. in front; white submarginal dots large, edged externally with blue, especially last ones, black submarginal dots R<sup>3</sup>—SM<sup>2</sup> conspicuous; admarginal spots C—R<sup>3</sup> orange ochraceous centred with orange, the others greenish olive buff, often yellowish in middle.

*Underside* clayish eern drab.—*Forewing*: discal and postdiscal interspaces of forewing creamy buff, discal luniform bars feebly marked, posterior ones obsolete.—*Hindwing*: discal interspaces paler than on forewing, but not sharply marked; postdiscal interstitial halfmoons not prominent, their proximal halves cream buff or pale straw yellow, distal halves dark cinnamon rufous.

Length of forewing: ♂, 30—33 mm.

" " ♀, 34—37 mm.

Triangular ridge of penis much reduced in height (Pl. VIII. f. 18).

*Hab.* Senegambia and the Hinterlands of the West Coast, probably as far south as Cameroons. In the Tring Museum 9 ♂♂, 6 ♀♀ from: Bathurst; R. Gambia; Gambaga, near Volta R., 28. viii. '99 (Col. Northcott); Gambaga, Nov. Dec. '98 (Capt. Giffard).

A ♂ specimen in the Tring Museum labelled "Cameroons" agrees with *viola*.

Both sexes of this form were described by Feisthamel in 1850 as *ephyra*. Dr. Butler, in 1865 and 1896, failed to recognise the identity of Feisthamel's insect with his own *viola*. What Dr. Butler considered in 1896 to be ♂♂ of *viola* are *ephyra* Godart, not *ephyra* Feisth. = *viola* Butl. Aurivillius, with wonted carefulness, put the synonymy right.

n<sup>6</sup>. Median bars of fore- and hindwing continuous.

o<sup>6</sup>. Upperside with a very strong blue gloss (♂).

### 75. *Charaxes thysi*.

*Charaxes thysi* Capronnier, *C. R. Soc. Ent. Belg.* XXXIII. p. 125. n. 70 (1889) (Kassai); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 374. n. 66. and p. 364. sub n. 33 (1896); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 236. n. 26. t. 5. f. 7 (1899) (Congo).

♂. Body *above* olivaceous black, head and pronotum with the usual white dots; *underside* buffish white, abdomen rather darker.

♂. *Wings above* black, with a strong hyacinth blue gloss.—Forewing: a postdiscal campanula blue band from SC<sup>5</sup> to internal margin, composed of seven spots, the first, third and fourth a little more proximal than the others, the band gradually broader behind, patch M<sup>2</sup>—SM<sup>2</sup> measuring 3 mm. in width.—Hindwing: band of forewing continued across disc to abdominal fold, its proximal margin convex before cell, where the band is 4½ mm. broad, its outer margin nearly straight, but indented upon the veins; a series of purplish blue submarginal dots; admarginal interstitial markings transverse, purplish blue, extending into tails, where they become whitish, anal one olive grey; abdominal fold pale brown, a triangular, grey, patch beyond end of SM<sup>3</sup>.

*Underside* silvery white.—Forewing: cell-bars similar to those of the allied species, bar 4 bent distad in middle; submedian bar M<sup>2</sup>—(SM<sup>1</sup>) just behind base of M<sup>2</sup>, submedian bar M<sup>1</sup>—M<sup>2</sup> proximal of base of M<sup>1</sup>; median bars forming a nearly continuous line, 2½ mm. distant from cell at R<sup>2</sup>, only 1½ mm. at R<sup>3</sup>; discal bars situated in a brown band which runs from costal to internal margin, is nearly straight, begins 11 mm. from apex of wing and crosses SM<sup>2</sup> 6 mm. from its end; to this band is joined a large, double, blackish brown, patch M<sup>2</sup>—SM<sup>2</sup>; postdiscal bars, bars SC<sup>3</sup>—M<sup>1</sup> represented by a pale brown, rather indistinct, zigzag line, while bar M<sup>1</sup>—M<sup>2</sup> is larger, blackish, and halfmoon-shaped; outer margin brown; submarginal, white, interspace M<sup>2</sup>—SM<sup>2</sup> resembling the number 3.—Hindwing: basal and subbasal costal bars, and subbasal bar C—SC<sup>2</sup> absent; submedian and median bars forming two nearly continuous lines, pale russet wood brown; the series of discal and postdiscal bars parallel, situated in a faintly curved, tawny, band of 2½ mm. breadth, nearly parallel to outer margin, crossing C 3 mm. from its end, discal bars linear, curved, postdiscal ones more rounded, except the last ones which are also linear and curved; submarginal bars abbreviated, but transverse, last two rounded, minute; admarginal, interstitial, markings transverse, ochraceous, bordered at both sides with a very thin white line, anal one olive; tails slender, acute.

♀. Unknown.

Length of forewing: 31 mm.

*Hab.* Kassai, Congo Free State (Capt. Thys), in Mus. Bruxelles, Mus. Stockholm, coll. Standinger.



The scales in the basal area of the forewing *above* have very short teeth, those in the outer half have scarcely any teeth.

*p*<sup>6</sup>. Blue gloss of upperside not strong.

*k*<sup>7</sup>. ♂ with pale blue band, ♀ with white band.

## 76. *Charaxes baumanni*.

*Charaxes baumanni* Rogenhofer, *Verh. Zool. Bot. Ges. Wien*. XLI. p. 564. ♀ (1891) (Pare); id., in Baumann, *Usambara* p. 328. n. 88 (1891); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 236. n. 25 (1899) (Manicaland; Zomba; Usambara).

*Charaxes whytei* Butler, *Proc. Zool. Soc. Lond.* p. 649. n. 20. t. 60. f. 2. ♂ (1893) (Zomba, I. XII.); id., *l.c.* p. 14 note (1894); Trim., *ibid.* p. 607 (1894); Butl., *l.c.* p. 255. n. 17. t. 15. f. 3. ♀ (1895) (Zomba); id., *l.c.* p. 720. n. 11 (1895) (Zomba); id., *Journ. Linn. Soc. Lond.* XXV. p. 363. n. 33 (1896) (Zomba).

*Charaxes selousi* Trimen, *Proc. Zool. Soc. Lond.* p. 45. n. 72. t. 6. f. 10. ♂ (1894) (Manicaland).

*Charaxes ethalion*, Butler, *l.c.* p. 362. n. 31 (1896) (pt.).

♂ ♀. *Body above* dark olive, four dots on head, a line behind eye, and two dots at each side of prothorax white; *underside* clay colour, palpi and middle of breast more creamy buff, upperside of anterior tibia of ♀ black.

♂. *Wings above* black.—Forewing: a postdiscal series of white spots parallel to outer margin anteriorly curved costad, upper spots minute, edged with pale blue, last ones larger, merged together to a band which is about 5 mm. wide at internal margin, nearly all whitish blue, 3 mm. distant from outer margin before SM<sup>2</sup>.—Hindwing: a broad disco-postdiscal blue|white band, tapering at both ends, its inner edge somewhat convex, especially posteriorly, crossing M at base of M<sup>1</sup>, its outer edge nearly parallel to outer margin; a series of white, minute, submarginal dots; admarginal interstitial markings transverse, continuous or subcontinuous, tawny, shaded with blue at edges, anal one yellow, spot C—SC<sup>2</sup> absent, the next one abbreviated.

*Underside* russet wood brown, glossy, except at outer margin of forewing and in disco-postdiscal area of hindwing.—Forewing: cell-bar 2 short, bar 3 separated into two dots, bar 4 straight, somewhat oblique; bar D thin; submedian M<sup>2</sup>—(SM<sup>1</sup>) behind point of origin of M<sup>2</sup>, bar M<sup>1</sup>—M<sup>2</sup> about 1½ mm. more distal; median bars more or less straight, continuous, the line straight, crossing R<sup>3</sup> about 1 mm. from crossveins, M<sup>2</sup> 5 mm. from its base, bordered white distally, the white scaling forming an ill-defined band; discal bars represented by an obsolete line which becomes more prominent on account of the scaling at its proximal side being deeper in tint than that at its distal side, the line parallel to the median line from R<sup>3</sup> to internal margin, 4 to 4½ mm. distant from it, then curving distad and costad; postdiscal bar (SM<sup>1</sup>)—SM<sup>2</sup> represented by a small black patch about 1 mm. distant of discal line, scaling whitish at discal side of the patch; vestiges of pale postdisco-submarginal wings.—Hindwing: no basal and subbasal costal bars and no subbasal bar C—SC<sup>2</sup>, submedian bars continuous, or the line slightly broken at base of R<sup>1</sup>; median bars continuous, the line appearing as a continuation of the line of forewing, straight, curving abdominad beyond (SM<sup>1</sup>), crossing M<sup>2</sup> at base, with an ill-defined, narrow, white, band at outer side; discal bars arched, concave distally, middle ones rather feebly marked, bar R<sup>2</sup>—R<sup>3</sup> more distal than the others, often obsolete, the series slightly biconcave; postdiscal bars ill-defined, partly obsolete, parallel to the discal ones, interspaces halfmoon-shaped, cinnamon rufous, olivaceous

proximally; submarginal white dots shaded with blue at edges, small, followed by the black, abbreviated, submarginal bars, which are bordered distally with a thin bluish white line each; admarginal transverse interspaces reddish rufous, contiguous, anal one olive buff, upper one reduced; tail slender, acute.

♀. *Wings, upperside*, black brown.—Forewing: a white discal band consisting of three small spots  $SC^{4,5}-R^3$ , more or less isolated, at  $R^2$  about 4 to 5 mm. from end of cell, followed by four contiguous patches, patch  $R^3-M^1$  the smallest, triangularly sinuate distally, patch  $M^1-M^2$  of the same length as the following ones, measuring 5 to  $5\frac{1}{2}$  mm. along veins, sinuate distally, inner edge of the band, from  $R^3$  to internal margin, almost unbroken, crossing  $M^2$  5 to 6 mm. from its base; a series of white postdiscal spots  $SC^4-M^1$  or  $SC^4-M^2$ , the series forming nearly a right angle, spots  $R^3-M^2$  close to discal band, subuniform.—Hindwing: discal band of forewing continued to abdominal margin, of nearly even width (5 to 7 mm.) down to ( $SM^1$ ), then much narrower; white submarginal dots more prominent than in ♂, followed by the submarginal bars which are deeper black than the ground of the wing; admarginal interspaces tawny ferruginous, more or less separated at veins, edged with pale blue.

*Underside* similar to that of ♂, but the white discal band as broad as, or broader than, on upperside; postdiscal area of forewing more or less whitish; postdiscal interspaces  $C-SC^2$  and  $R^3-M^1$  of hindwing more or less white, this scaling sometimes extended to outer margin; upper tail not pointed, 6 mm. long, second pointed, 5 mm. long.

Length of forewing: ♂, 28–30 mm.

” ” ♀, 30–33 mm.

*Hab.* East Africa: Manicaland, Nyassaland, German East Africa, Usambara. In the Tring Museum 1 ♂, 2 ♀♀ from Zomba, xii. 95 (Dr. Percy Rendall), Dar-es-Salaam.

♂ Upperside black and orange.

## 77. *Charaxes anticlea* (Nov. Zool. V. t. vi. f. 4. ♀).

*Papilio Nymphalis Phaleratus anticlea* Drury, *Illustr. Ex. Ins.* III. p. 36. t. 27. f. 5. 6 (1782) (S. Leone).

*Papilio Nymphalis horatius* Fabricius, *Ent. Syst.* III. 1. p. 64. n. 202 (1793) (*hab. ?*).

♂ ♀. *Body above* olive black, head and anterior part of thorax somewhat russet, four dots on head, a line behind eye, and two dots laterally on prothorax, white; *underside*, palpi, middle of breast and legs pale clay colour, sides of breast clayish brown, abdomen clay colour, upperside of anterior tibia black, of four posterior femora also black, speckled with white scales.

♂. *Wings above* velvety black.—Forewing: a postdisco-submarginal band cadmium orange, broadest behind, more or less continuous from  $M^1$  to internal margin, partitions  $SC^5-R^1$  separated, often reduced to small spots, the upper ones often absent, the spots sometimes horseshoe-shaped, the band seldom reduced to a small spot  $M^1-M^2$  and a large patch between  $M^2$  and internal margin; black marginal border varying in width between  $M^1$  and  $SM^2$  from  $\frac{1}{2}$  to  $2\frac{1}{2}$  mm.—Hindwing: outer area cadmium orange, extending down to bent of  $R^3$ , seldom to base of  $M^1$ , the area narrowed costally; a series of black postdisco-submarginal

spots with white centres, the spots seldom so large that they almost touch each other, the middle ones mostly absent, the upper two often joined to the black basi-discal area, a thin, sharply defined, marginal line black; abdominal fold clayish brown.

*Underside* bistre brown, with a pinkish and rufous tint, basal areas, proximal part of discal areas and part of outer areas, especially in apical region of forewing, with a pinkish grey gloss.—Forewing: cell-bar 2 short, ovate or rounded, bar 3 represented by two heavy dots, bar 4 oblique, curved distad in middle, concave near ends, continuous with submedian bars  $M^1$ — $SM^2$ , submedian bar  $M^2$ — $SM^2$  generally heavy, like the respective median one; median bars more or less continuous, parallel to the submedian series, crossing  $R^2$  close to lower angle of cell, the brown median interspaces band-like; discal bars feebly marked, arched, concave distally, the series about midway between median bars and outer margin, obtusely angled at  $R^1$ ; postdiscal bars  $M^2$ — $SM^2$  represented by two ill-defined, black, patches, which are often preceded by a patch  $M^1$ — $M^2$ ; posterior postdiscal and submarginal interspaces more or less obscurely cinnamon rufous.—Hindwing: no basal and subbasal costal bars, subbasal bar  $C$ — $SC^2$  also absent; submedian and median bars forming two continuous lines, which are parallel, costal bars heavier than the others, brown median interspaces band-like; glossy scaling at outside of median line band-like; discal and postdiscal bars arched, parallel, the double series somewhat angled at  $R^2$ , interspaces rufous red, upper ones more olive; black submarginal bars thin, last two small dots, the upper ones obsolete or vestigial, the others concave proximally, edged purplish white distally, white submarginal dots shaded with purple; admarginal interspaces continuous, except upper one which is isolated, rufous red, anal one olive buff; black marginal line edged with bluish white, metallic plumbeous at anal angle; tails short, triangular.

♀. Wings broader, hindwing less triangular, outer margin of forewing less concave than in ♂. *Upperside* dull brownish black.—Forewing: a pale orange disco-postdiscal band anteriorly divided into two discal and three postdiscal spots, while the discal and postdiscal spots  $R^2$  to internal margin show seldom vestiges of a black line separating them; discal and postdiscal spots  $R^1$ — $R^2$  sometimes joined together along  $R^2$ , the band 8 to 10 mm. broad at  $SM^2$ , more or less concave between the veins at both sides.—Hindwing: the band continued to abdominal margin, narrowed beyond ( $SM^1$ ), very little narrower in front than behind, paler than on forewing, except at outer edge; submarginal white dots seldom all marked, upper ones mostly obsolete, sometimes all obsolete except the last two; admarginal interspaces orange, continuous, interstitial spot  $C$ — $SC^2$  sometimes separated, anal one thin, olive buff.

*Underside* paler than in ♂, bars heavier; discal and postdiscal interspaces of forewing pale buff, except a brown patch  $SC^3$ — $R^2$  at proximal side of discal bars, more than proximal half of discal interspaces of hindwing occupied by creamy band, tails longer than in ♂.

Length of forewing: ♂, 28—31 mm.

    "                    "      ♀, 31—33 mm.

Clasper with the rather broad apex narrowed into a hook which points mesiad; penis-funnel short, narrow, triangular, gradually curved in a side view, apex produced downwards into a sharp, rather long, pointed, tooth; penis armed about 2 mm. from end by a short row of rather heavy dorso-lateral teeth.

*Hab.* West Africa from Senegambia to Angola and Uganda.

a. *Ch. anticlea anticlea*.

*Papilio Nymphalis Phaleratus anticlea* Drury, l.c.

*Papilio Nymphalis horatius* Fabricius, l.c.

*Nymphalis anticlea*, Godart, *Enc. Méth.* IX. p. 353. n. 9 (1823) (S. Leone); Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. p. 309. n. 13 (1850) (S. Leone); Kirby, *Cat. Diurn. Lep.* p. 268. n. 14 (1871) (S. Leone).

*Nymphalis horatius*, Godart, l.c. p. 354. n. 13 (1823).

*Charaxes anticlea*, Doubleday, *List. Spec. Lep. Ins. Brit. Mus.* I. p. 110 (1844) (S. Leone); Butl., *Proc. Zool. Soc. Lond.* p. 627. n. 14 (1865) (S. Leone); Butl., *Cat. Diurn. Lep. descr. by Fabr.* p. 53. n. 11 (1869); Westw., *Thes. Oron.* p. 181. t. 34. f. 5. ♀ (1874) (S. Leone); Schaus & Clements, *Sierra Leone Lep.* p. 8 (1893); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 364. n. 34 (1896) (pt.; S. Leone); Auriv., *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 235. n. 24 (1899) (pt.; S. Leone).

*Charaxes horatius*, Feisthamel, *Ann. Soc. Ent. Fr.* p. 259. n. 11. ♂, ♀ (1850) (Cazamanca).

♂. Black border of forewing *above* 1 mm. (or less) wide between  $M^2$  and internal margin.

♀. Forewing *above*, orange patches  $R^1$ — $R^2$  completely separated; hindwing, orange admarginal markings continuous *above* and *below*.

*Hab.* Senegambia to the Niger (?). In the Tring Museum 16 ♂♂, 2 ♀♀ from Sierra Leone, vi. vii., '99 (Capt. Stevens); Accra.

As we have not seen specimens from the Niger, we do not know how far south this form extends, but judging from analogy we believe that it does not range farther south than the Niger.

b. *Ch. anticlea adusta* Rothsch. subsp. nov.

*Nymphalis anticlea*, Dewitz (non Drury, 1782), *Nov. Act. Leop. Car. Ak. Naturf.* XLI. 2. 2. p. 28 (1879) (N. Angola).

*Charaxes anticlea*, Capronnier, *C. R. Soc. Ent. Belg.* XXXIII. p. 146. n. 82 (1889) (Gabun); Butl. l.c. (part. Angola); Auriv., l.c. (pt.; Cameroons; Gabun; Angola).

♂. Black border of forewing *above* 2 mm. (or more) wide between  $M^2$  and internal margin.

♀. A ♀ from the Cameroons (Barombi) in the Berlin Museum differs from the Sierra Leone ♀♀ as follows:—*Upperside*, forewing: orange patches  $R^1$ — $R^2$  not completely separated; hindwing: admarginal orange markings thin, posterior ones separated between the veins, anal one very faint. *Underside*: discal bars heavier, interspaces between them darker; hindwing: submarginal white dots larger than in the ♀ of *ant. anticlea*, posterior admarginal orange spots interrupted between the veins.

*Hab.* Cameroons to Angola, Congo and Uganda. In the Tring Museum 5 ♂♂ from Kampala (*type*), 21. iii. '97 (Dr. Ansorge), Leopoldville, and Lukolele, Congo.

In a ♂ from Niam-Niam in Dr. Staudinger's collection the orange area of the hindwing is very wide, extending proximally to the point of the origin of  $M^1$ .

$p^3$ . Discal bars of fore- and hindwing not regularly arched.

$q^4$ . Underside not green, scaled.

$o^5$ . Markings of upperside blue.

$q^6$ . Cell of forewing above with a large blue patch.

$m^7$ . Forewing above without conspicuous, blue, marginal patches.

78. *Charaxes mycerina*.

*Nymphalis mycerina* Godart, *Enc. Méth.* IX. p. 369. n. 65 (1823) (bab?; "N. B" excepted); Lucas, *Lep. Er.* p. 124. t. 65. f. 2 (1835).



*Charaxes nausicaa* Staudinger, *Iris* IV. p. 137 (1891) (S. Leone ; Cameroons) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 373. n. 64 (1896) (O. Calabar ; R. Ogowé).  
*Charaxes mycerina*, Aurivillius, *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 244. n. 73 (1899) (S. Leone ; Cameroons ; Kuilu ; Kassai).

♂ ♀. Head, pronotum and anterior part of mesonotum olive mummy brown, rest of *upperside* olivaceous black, the dots on head white ; antennae chestnut ; *underside* of palpi and middle of prosternum creamy white, rest of underside clayish creamy buff, abdomen deeper in tint in ♀ than in ♂ ; legs tawny, with whitish grey scaling, femora nearly black ; anterior tibia mummy brown, anterior tarsus creamy white.

♂. *Wings above* blue black, markings pale blue, purplish in side-light.—Forewing : outer margin deeply concave between  $SC^5$  and  $M^2$ , more produced at  $SC^5$  than at apex proper ; cell blue, except a patch in upper angle, the blue scaling, however, not very dense, especially distally, the black underscales not all covered ; two discal spots  $SC^4-R^1$ , 3 mm. from cell, elongate, the upper short and thin, the second 3 to 5 mm. long,  $1\frac{1}{2}$  mm. broad ; a postdiscal series of five spots, uppermost spot between  $SC^5$  and  $R^1$ , 10 mm. from cell, elongate ovate,  $3\frac{1}{2}$  to 4 mm. long, no spots between  $R^1$  and  $R^3$ , four posterior spots between  $R^3$  and internal margin, in a slightly curved series, spot  $R^3-M^1$  the smallest, spot  $M^1-M^2$  rounded, diameter about  $1\frac{3}{4}$  mm., spot  $M^2-SM^2$  sometimes incised distally, subrectangular, diameters 2 and 3 mm., last spot 4 to 6 mm. from end of  $SM^2$ , 4 mm. long.—Hindwing : a discal band from C to ( $SM^1$ ), narrowing in front, continuous from  $R^1$  to ( $SM^1$ ), 4 to 5 mm. broad at  $M^1$ , partitions C— $R^1$  isolated, spot C— $SC^2$  sometimes very small, 4 to 5 mm. from end of C, inner edge of band crossing M at point of origin of  $M^1$  ; two or three minute submarginal dots near anal angle ; five transverse admarginal spots between  $R^1$  and  $SM^2$ , slightly separate at veins, or contiguous, anal one very thin, spot  $R^1-R^2$  often divided, a vestige of spot  $SC^2-R^1$  sometimes present ; abdominal fold blackish brown.

*Underside* clay colour, rather glossy ; median interspaces, and a large, subtriangular, disco-postdiscal area from C to  $M^1$  of forewing and outer margin of both wings bistre brown, hindwing shaded with grey ; bars thin.—Forewing : no basal cell-spot, cell-bar 2 absent, cell-bar 3 represented by two small dots, thinly bordered white, the second about  $1\frac{1}{2}$  mm. from base of  $M^2$ , bar 4 transverse, very little oblique, slightly irregular, reaching M midway between  $M^1$  and  $M^2$ , its upper end  $2\frac{1}{2}$  mm. from base of  $R^1$ , ground paler clay colour at proximal side of bar 4 than near bar 3 ; bar D very thin ; submedian bars  $M^1-SM^2$  continuous with cell-bar 4, forming with it a slightly curved line which crosses  $M^2$   $2\frac{1}{2}$  mm. from base of  $M^2$  ; median bars  $SC^4-SM^2$  continuous, the bars somewhat concave proximally, forming a line which begins  $4\frac{1}{2}$  mm. from base of  $SC^{4,5}$ , and crosses  $M^1$  2 mm. from base of  $M^1$ , the median and submedian lines parallel behind, divergent in front ; median bar  $M^2-SM^2$  straight, or distally concave ; discal interspaces  $SC^{4,5}-R^3$  shaded with grey, width of this greyish area  $2\frac{1}{2}$  mm. at  $SC^{4,5}$ , and 5 mm. at  $R^2$  ; no discal and postdiscal bars, but there is a disco-postdiscal, very indistinct, dark clayish line between internal margin and apex of wing, 7 mm. from outer margin at  $SM^2$ , slightly curved, proximally bordered with silvery white scales down to  $M^1$ , this scaling reaching outer margin of wing in front.—Hindwing : no basal costal bar, no subbasal bars ; submedian bars almost continuous, forming a proximally concave line from costal margin to M which crosses C 2 mm. from PC, and reaches M  $2\frac{1}{2}$  mm. from  $M^2$ , bar  $M^1-(SM^1)$  near base of  $M^2$  ; bar D extremely

thin; median bars more or less concave distally, forming a continuous line which is concave distally between costal margin and  $R^3$ , then convex, crossing  $M^1$  close to its base, and reaching abdominal margin 2 mm. beyond end of  $SM^3$ , last bar, however, indistinct; discal bars merged together to a continuous, tawny olive, line, which is somewhat concave distally, begins 2 mm. before end of C, and terminates at abdominal margin 3 mm. from end of  $SM^2$ ; close to, and nearly parallel with, this line is a postdiscal line between abdominal margin and  $R^3$ , which widens out into an indistinctly defined patch between  $R^2$  and  $SC^2$ , interspace between the two lines clay colour, postdiscal line sometimes only vestigial; a series of extremely small, white, submarginal dots, the dots about 2 to  $2\frac{1}{2}$  mm. from outer margin; edge of wing very feebly scalloped, tail  $R^3$  represented by a short triangular tooth, no second tail, abdominal angle produced but rounded.

♀. *Wings, upperside*, paler than in ♂, blue brown.—Forewing: outer margin more produced at  $SC^5$  than in ♂, discal and postdiscal spots a little larger, a vestige of a postdiscal spot  $R^1$ — $R^2$ .—Hindwing: band wider than in ♂, 5 mm. broad at  $M^2$ , patch  $SC^2$ — $R^1$  not separated.

*Underside* as in ♂, but costal submedian bar of hindwing about 2 mm. more proximal than bar C— $SC^2$ ; tail  $R^3$  5 mm. long, broad, subtruncate.

Length of forewing: ♂, 36—37 mm.

” ” ♀, 43 mm.

Clasper produced apically into a narrow, somewhat spoon-shaped lobe, which is not pointed; penis-funnel (Pl. VIII. f. 48. 49) suddenly narrowed distally, of the shape of a reversed tulip, the compressed apex not forming a hook, but a rounded mesial crest which extends upon the upperside; penis with a dorsal series of very small teeth, the series turning proximally towards the left side; tenth tergite bilobed.

*Hab.* Sierra Leone to the Congo. In the Tring Museum 2 ♂♂, 1 ♀ from: Gold Coast; Cameroons; Stanley Pool to Lukolele.

*n*<sup>1</sup>. Forewing above with conspicuous, blue, marginal patches.

## 79. *Charaxes doubledayi*.

*Charaxes mycerina*, Donbleday (non Godart, 1823), *List. Spec. Lep. Ins. Brit. Mus.* I. p. 109 (1844) (S. Leone); Butl., *Proc. Zool. Soc. Lond.* p. 638. n. 65 (1865) (S. Leone); Staud., *Exot. Tagf.* p. 171 (1886) (S. Leone; O. Calabar); Auriv., *Ent. Tidskr.* XII. p. 216. n. 143 (1891) (Cameroons); Schaus & Clements, *Sierra Leone Lepid.* p. 9 (1893); Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 192. n. 59 (1894) (Togo); Auriv., *l.c.* XV. p. 311. n. 200 (1894) (Cameroons, V.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 372. n. 63 (1896) (S. Leone; O. Calabar; Fernando Po; Cameroons).

*Nymphalis mycerina*, Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 310. n. 40. t. 53. f. 2. ♂ (1850) (syn. excl.; S. Leone); Kirby, *Cat. Diurn. Lep.* p. 270. n. 30 (1871) (pt.).

*Charaxes doubledayi* Aurivillius, *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 244. n. 74 (1899) (S. Leone, type; Ashanti; Togo; O. Calabar; Cameroons; Ogowé R.).

♂ ♀. Similar to *Ch. mycerina*; antennae much darker, the blue scaling in the cell of the forewing denser and more extended, forewing with admarginal blue spots, band of hindwing of ♂ not interrupted at  $R^1$ . On the *underside* the cell-bar of forewing more straight, more obliquely placed, its upper end being only  $1\frac{1}{2}$  mm. distant from base of  $R^1$ , median bars also straighter, the bistre brown outer marginal band more sharply defined, the clay coloured area between it and the disco-postdiscal

line divided by a band of bistre brown patches ; median bar  $M^2$ — $SM^2$  straight or distally convex ; costal median bar of hindwing 3 or 4 mm. more distal than bar  $C$ — $SC^2$  ; the white borders of the bars of both wings much more prominent than in *mycerina* ; anal angle less produced.

♀. Differs from *Ch. mycerina* in a similar way as the ♂.

Length of forewing : ♂, 35—42 mm.

” ” ” ♀, 42 mm.

*Hab.* Sierra Leone to the Congo Basin ; not rare. In the Tring Museum 28 ♂♂ from : S. Leone ; Accra and Mamfé, Begorro ; Calabar ; Cameroons ; Ogowé R. ; Upper Congo.

$r^6$ . Cell of forewing above without blue patch.

$\sigma^7$ . Hindwing above with blue band in middle.

### 80. *Charaxes porthos*.

*Charaxes porthos* Smith, *Ent. Mo. Mag.* XX. p. 57 (1883) (Cameroons) ; id. & Kirby, *Rhop. Exot.* I. *Charaxes* t. 1. f. 4. 5. ♂ (1887) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 372. n. 62 (1896) (O. Calabar) ; Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 244. n. 70 (1890) (Cameroons ; Gaboon ; Bena-Bendi, Congo).

*Charaxes midas* Staudinger, *Iris* IV. p. 135. t. 2. f. 4. ♂ (1891) (Cameroons).

♂. Body as in *Ch. zelica* ; antennae chestnut.

♂. *Wings*, upperside blue black as in *mycerina* ; an azure blue band from near apex of forewing to  $SM^2$  of hindwing which it reaches in middle, the band nearly straight, reaching internal margin of forewing 9 mm. from end of  $SM^2$ , separated, on the forewing, into more or less rhomboidal patches, patch  $R^1$ — $R^2$  about  $2\frac{1}{2}$  mm. in width, the others slightly broader, a minute dot before  $R^1$ , on hindwing the band narrows towards costal margin, being  $5\frac{1}{2}$  mm. broad along  $M^2$  and  $2\frac{1}{2}$  mm. at  $SC^2$ .—Forewing : a small discal spot  $R^1$ — $R^2$ , 4 mm. from cell, blue, seldom preceded by another spot ; outline of wing as in *zelica*, but outer margin more concave in posterior half.—Hindwing : a series of submarginal dots, dots  $C$ — $R^1$  white, edged with pale blue, the others minute, blue ; vestiges of a blue admarginal line.

*Underside* vinaceous cinnamon, shaded over with glossy grey ; a rather heavy line of burnt umber colour, faintly bordered black proximally in some places, extends from end of  $SC^5$  of forewing to abdominal margin of hindwing, which it reaches 3 mm. from end of  $SM^2$ , the line crossing  $SM^2$  of forewing and  $C$  of hindwing 8 mm. from end, slightly curved at both extremities, with two patches of glossy grey scaling proximally at its upper end ; cell-bars of forewing, and submedian and median bars of both wings as in *zelica*, but a little heavier.—Forewing : outer marginal area less greyish, more pure cinnamon, than rest of wing, slightly deeper in tint between  $SC^5$  and  $M^1$ , especially near margin.—Hindwing : a series of minute, white, submarginal dots, upper two the largest, the last two accompanied distally by a black dot each ; no tails, outer margin very faintly toothed at  $R^3$ , anal angle somewhat produced, but rounded.

♀. Unknown.

Length of forewing : ♂, 38 mm.

*Hab.* Cameroons ; Gaboon ; Congo. In the Tring Museum 1 ♂ from Carnotville Apparently as rare as *zelica*.

*p*<sup>1</sup>. Blue band of hindwing beyond middle.

*c*<sup>8</sup>. Forewing above with a series of spots near the middle of the wing.

### 81. *Charaxes zelica*.

♂. *Charaxes zelica* Butler, *Ent. Mo. Mag.* VI. p. 28 (1869) (Ashanti?); id., *Lep. Ex.* p. 12. t. 5. f. 3. ♂ (1869); Auriv., *Ent. Tidskr.* XV. p. 311. n. 199 (1894) (Cameroons, V.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 372. n. 61 (1896) (Ashanti?); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 244. n. 71 (1899) (Ashanti?; Cameroons; Angola).

♂. Body *above* olive black, mummy brown in front; *underside* of palpi, middle of prosternum, and anterior tarsi creamy white, breast olive mummy brown, four posterior tibiae and abdomen cinnamon, femora black, with white scales, tarsi clayish buff.

♂. *Wings above* blue black, glossy in basal area, with a faint greenish sheen, fringe of both wings creamy buff.—Forewing: outer margin concave, apex rounded, though produced; a discal series of small pale blue spots, the series straight from SC<sup>4.5</sup> to SM<sup>2</sup>, spot SC<sup>4.5</sup>—R<sup>1</sup> about 2 mm. long, 5 mm. from cell, spot R<sup>2</sup>—R<sup>3</sup> absent, spots R<sup>3</sup>—SM<sup>2</sup> transverse, about 1 to 1½ mm. thick, widely separated from one another, spot M<sup>2</sup>—SM<sup>2</sup> 7 mm. from outer margin, spot behind SM<sup>2</sup> more proximal, elongate; a rounded postdiscal dot SC<sup>5</sup>—R<sup>1</sup> 11 mm. from outer margin, pale blue.—Hindwing: an almost straight series of postdiscal spots, upper one transverse, about 1½ mm. thick, 4 mm. from end of C, spots SC<sup>2</sup>—R<sup>2</sup> more rounded, a little larger, spots R<sup>3</sup>—SM<sup>2</sup> transverse, 1 to 1½ mm. thick; a submarginal series of small, white, submarginal dots, edged with blue; a series of transverse admarginal pale blue spots, the spots separated, sometimes obsolete.

*Underside* olive mummy brown, a darker brown line from apex of forewing to anal angle of hindwing, crossing SM<sup>2</sup> of forewing 6 mm. from end, M<sup>1</sup> of hindwing 4 mm. from its base, slightly curved on either wing, bordering the outer marginal area which is wood brown; bars and their white borders extremely thin, sometimes just traceable.—Forewing: no cell-bars 1 and 2, bar 3 separated into two minute dots as in *mycerina*, bar 4 transverse, nearly straight, nearly parallel to cross veins; submedian bars M<sup>1</sup>—SM<sup>2</sup> continuous with cell-bar 4; median bars more or less concave distally, continuous, the line beginning 2½ mm. from base of SC<sup>4.5</sup>, bar M<sup>2</sup>—SM<sup>2</sup> concave or biconcave distally; a wood brown patch at proximal side of submedian bar M<sup>2</sup>—SM<sup>2</sup>, and another at the distal side of median bar M<sup>2</sup>—SM<sup>2</sup>, both very conspicuous; marginal area with vestiges of a submarginal and a postdiscal olivaceous band.—Hindwing: submedian and median bars similar to those of *mycerina*, but thinner; outer area with a postdiscal olivaceous mummy brown band which gradually fades away distally; white submarginal dots small but all marked, the posterior ones with small black dots at outer side; edge of wing slightly dentate, anal angle produced, rather acute, no tail.

♀. Unknown.

Length of forewing: ♂, 39 mm.

*Hab.* Recorded from Cameroons, Angola and (?) Ashanti; in the Tring Museum 3 ♂♂, one without locality, another from Carnotville, the third from between Kumassi to Kintampo, iv. '99 (Col. Northcott). Rare in collections.

*c*<sup>8</sup>. Forewing above with a series of spots close to outer margin.

### 82. *Charaxes laodice*.

♀. *Papilio Nymphalis Phaleratus laodice* Drury, *Illustr. Exot. Ins.* III. p. 34 and index. t. 26. f. 1. 2. ♀ (1782) (S. Leone).



- ♀. *Papilio Nymphalis lycurgus* Fabricius, *Ent. Syst.* III. 1. p. 67. n. 209 (1793) (Africa).  
 ♀. *Nymphalis lycurgus* Godart, *Enc. Meth.* IX. p. 364. n. 49 (1823) (S. Leone).  
 ♀. *Philonoma laodice*, Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* II. p. 311. n. 3 (1850); Butl., *Cat. Diurn. Lep. descr. by Fabr.* p. 49. n. 1 (1869); Plötz, *St. E. Zeit.* p. 194. n. 109 (1880) (Cameroons).  
 ♂. *Nymphalis nesiope* Hewitson, *Exot. Butt. I. Nymphalis* t. I. f. 5. 6 (1854) (S. Leone); Kirby, *Cat. Diurn. Lep.* p. 270. n. 31 (1871).  
 ♂. *Charaxes nesiope*, Butler, *Proc. Zool. Soc. Lond.* p. 639. n. 66 (1865); Druce, *ibid.* p. 413. n. 9. (1875) (Angola); Dewitz, *Nov. Act. Leop. Car. Ak. Naturf.* L. 4. p. 371 (1889) (N. Angola, X. II.); Capronu., *C. R. Soc. Ent. Belg.* XXXIII. p. 126. n. 73 (1889) (Congo); Auriv., *Ent. Tidskr.* XII. p. 216. n. 144 (1891) (Cameroons).  
 ♂ ♀. *Charaxes laodice*, Aurivillius, *Lc.* XV. p. 312. n. 201 (1894) (Cameroons; *nesiope* = ♂ of *laodice*); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 373. n. 65 (1896) (O. Calabar; Fernando Po; Cameroons; Angola; L. Tanganyika); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 244. n. 72 (1899) (Ashanti; O. Calabar; Cameroons; Gaboon; Congo; Angola; Tanganyika).  
 ♀. *Palla laodice*, Kirby, *Cat. Diurn. Lep.* p. 274. n. 4 (1871) (S. Leone).

♂ ♀. Body as in *Ch. mycerina*, breast deep burnt umber colour, antennae chestnut.

♂. *Wings above* blue black, with pale azure blue markings, which assume a purplish tint in side-light.—Forewing: two discal spots  $SC^6-R^2$ , 5 mm. from cell, the second sometimes vestigial; a postdiscal series of spots from  $SC^5$  to internal margin, parallel to outer margin, only  $2\frac{1}{2}$  to 3 mm. distant from it, spots  $R^1-R^3$  minute, often absent, spot  $M^2-SM^2$  the largest, transverse, diameters 2 and  $3\frac{1}{2}$  mm.—Hindwing: a postdiscal series of spots, forming a more or less interrupted, almost straight band, widest in middle, 2 to 3 mm., spot  $C-SC^2$  very small or absent, posterior spots (or all) slightly concave distally, spot  $R^2-R^3$  4 mm. distant from outer margin; a series of extremely small bluish white submarginal dots, often partly absent; admarginal spots transverse, separated at veins, upper one or two, seldom also anal one, absent; abdominal fold brownish black.

*Underside* varying from walnut to burnt umber brown; glossy grey, especially a median, a discal and a postdiscal band on forewing, and the whole hindwing except a band in postdisco-submarginal area.—Forewing: submedian and median lines of bars nearly as in *Ch. doubledayi*, white edging rather prominent, median bar  $M^2-SM^2$  more or less concave distally, cell-bar 4 oblique, nearly touching upper angle of cell, submedian bar  $M^2-SM^2$  at proximal and median bar  $M^2-SM^2$  at distal side with a cinnamon patch; discal bar indicated by brown transverse spots or lunules, which form an indistinct line anteriorly curving towards outer margin; ending at  $SC^5$ , proximally bordered by glossy white scaling, which is condensed before  $SC^5$  to a rather large, conspicuous, admarginal patch; within the postdisco-marginal, not glossy, area, there is a postdiscal and a submarginal series of ill-defined, cinnamon, interstitial spot; apex of wing produced as in *Ch. doubledayi*, outer margin angled at  $M^2$ .—Hindwing: submedian line of bars more or less broken at veins, strongly concave proximally taken as a whole; median line of bars about parallel to the submedian one from C to  $R^3$ , costal bar more distal than the concave bar  $C-SC^2$  in most specimens; a discal line, continuous, brown, slightly concave distally, beginning  $2\frac{3}{4}$  mm. from end of C, crossing  $R^3$   $3\frac{1}{2}$  mm. from base of  $M^1$ , and ending at abdominal margin near anal angle, externally bordered by a cinnamon line upon which follows a brown postdiscal band which fades away distally; a series of minute, white, submarginal dots; an admarginal cinnamon rufous line, more or less widely interrupted at the veins; a short tooth at  $R^3$ , outer margin rather more distinctly concave between veins, anal angle produced as in *zelica*.

♀. *Wings above* purplish blue brown, outer margin burnt umber colour ; markings somewhat paler than in ♂.—*Forewing*: apex more strongly produced than in ♂, angled at SC<sup>5</sup> ; two discal spots SC<sup>5</sup>—R<sup>2</sup> ; postdiscal spots smaller than in ♂, spots R<sup>1</sup>—R<sup>3</sup>, or SC<sup>5</sup>—R<sup>3</sup> absent, last spot very small or absent, spots M<sup>1</sup>—SM<sup>2</sup> transverse, more or less concave distally.—*Hindwing* : postdiscal band narrower than in ♂, slightly concave proximally, the spots composing it all isolated, transverse, more or less halfmoon-shaped, submarginal dots white, rather more prominent than in ♂, but the series not always complete ; admarginal spots absent or partly vestigial.

*Underside*, paler than in ♂, more russet brown ; tail R<sup>3</sup> 5 mm. long, dilated at apex, truncated or rounded.

Length of forewing ; ♂, 32—38 mm.

                                    ♀, 40—43 mm.

*Hab.* West Africa from the Gold Coast to Angola, the Upper Congo and the Tanganyika. In the Tring Museum 16 ♂♂, 2 ♀♀ from : Accra and Mamfé, Gold Coast ; Begoro, Ashanti ; Warri, Niger Coast Protectorate, vi. '96 (Dr. Roth) ; Sobo country, Lower Niger, iv. '95 (Dr. Roth) ; Ogowé R. ; Bopoto, Upper Congo ; Lukolelo, Congo ; Kassai ; Kitima in the great forest of the Upper Congo, twenty-one days' march from Fort Beni, Congo Free State, 25. v. '99 (Dr. Ansorge).

p<sup>5</sup>. Markings of upperside not blue.

s<sup>6</sup>. Cell-bar 4 of forewing below distal of point of origin of M<sup>1</sup>.

### 83. *Charaxes nichetes*.

*Charaxes nichetes* Smith, *Ent. Mo. Mag.* XX. p. 58. (1883) (♂, ♀, Cameroons) ; Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 244. n. 69 (1899).

♂♀. *Body above* orange to dark tawny, often with a purplish sheen, tips of palpi black ; *underside* ochraceous buff to pale tawny hazel.

♂. *Wings above* orange ochraceous rufous, varying in the depth of the tint with a beautiful reddish purple sheen in side-light.—*Forewing*: outer margin deeply concave, apex therefore much produced, most distal point between veins SC<sup>4</sup> and SC<sup>5</sup> ; cell-bar 3 represented by a brown spot ; bar D widened in costal half ; median bars R<sup>3</sup>—M<sup>2</sup> as rounded spots or patches, median bar M<sup>2</sup> (SM<sup>1</sup>) often absent, bars SC<sup>6</sup>—R<sup>2</sup> about 5 to 7 mm. from cell, as spots or small patches ; discal bars enlarged forming a purplish black band which is externally concave between the veins, often produced distad at veins to join the brown or deep tawny marginal band, the proximal edge of which is often marked by blackish bars, width of discal band very variable.—*Hindwing* : anal angle produced, outer margin rounded, slightly scalloped, no tails ; a purplish black discal band of variable width stopping at abdominal fold, widest in middle, almost parallel to outer margin, crossing R<sup>3</sup> just proximal of bent of this vein, distally dentate upon R<sup>1</sup> ; postdiscal and submarginal merged together to rings.

*Underside* tawny hazel, with a slight reddish purple gloss, bars dark cinnamon rufous, not prominent.—*Forewing* : cell-bar 1 absent, bar 2 abbreviated in front, bar 3 abbreviated behind, sometimes composed of a larger anterior and a tiny posterior spot, 4 mostly arched, seldom straight, situated near end of cell, touching (or almost so) bar D at ends ; subbasal bar M<sup>2</sup> (SM<sup>1</sup>) indicated by a dot proximally of base of M<sup>2</sup> ; submedian bars R<sup>3</sup>—SM<sup>2</sup> concave distally, the

respective median bars concave proximally, the two bars often joined together to rings; no median bar  $R^2-R^3$ , median bars  $SC^4-R^1$  oblique, straight or distally convex; discal bars  $SC^4-R^1$  proximally concave, about 8 mm. from cell; a thin, purplish black, or deep tawny, mostly continuous, line beginning at costal margin 6 mm. from apex to internal margin, crossing  $SM^2$  about 10 mm. from end; area between this line and outer margin with a whitish gloss except a line of postdiscal, triangular, spots; a white submarginal spot  $SC^4-SC^5$ .—Hindwing: basal and subbasal bars indistinct or absent; costal submedian and median bars absent; submedian line of bars generally reaching  $SM^2$ , the bars widely separated from one another, bar  $M^2-(SM^1)$  just distal of base of  $M^2$ , or exactly at the point of origin of this vein; median line of bars also widely interrupted at the veins, bar  $R^1-R^2$  close to origin of  $R^2$ ; a straight discal line, posteriorly approaching anal angle, crossing  $R^3$  about 2 mm. from base of  $M^1$ ; abdominal area and area between that line and margin glossy grey, except a series of postdiscal tawny spots, of which the upper ones are triangular pointing distad, the posterior ones luniform, being distally concave, an admarginal and a marginal line also excepted.

♀ Like ♂, ground colour less bright, black markings of *upperside* more extended; hindwing less produced at anal angle, tooth  $R^3$  and  $M^2$  a little longer than the others.

Length of forewing: ♂, 35–37 mm.

” ” ♀, 41 mm.

Clasper produced into a simple, strong, hook; the ridge which runs from the tip of the hook to the inner surface of the clasper is rather high and ends somewhat abruptly; tenth tergite divided into two sharply pointed processes; penis thin, with very minute teeth forming an irregular, oblique series beginning about 3 mm. from the end; penis-funnel short, triangular, apex compressed, rather strongly chitinated, turned down to a sharp hook.

*Hab.* Cameroons to Angola, Nyassaland; two subspecies.

The differences between the two forms *leoninus* and *nichetes* do not justify a specific separation, nor are they constant, certain Angola individuals standing intermediate in character between typical *nichetes* and typical *leoninus*.

#### a. *Ch. nichetes leoninus*.

*Charaxes leoninus* Butler, *Proc. Zool. Soc.* p. 253. n. 12. t. 15. f. 2. ♂ (1895) (Zomba); id., *l.c.* p. 720. n. 13 (1895) (Zomba); id., *Journ. Linn. Soc. Lond.* XXV. p. 372. n. 59 (1896) (Zomba); id., *Proc. Zool. Soc. Lond.* p. 823. n. 14 (1896) (Lower Nyika, VI.).

*Charaxes nichetes* var. *leoninus*, Aurivillius, *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 244. sub n. 69 (1899) (Zomba).

♂. *Body above* and wings orange ochraceous rufous; discal reddish purple, black band of wings narrow, that of forewing not extended to rounded median bars, that of hindwing mostly narrower than the interspace between itself and the thin bar D, from which it is separated, width 2 to  $3\frac{1}{2}$  mm. at  $R^1$ .

*Underside*: discal line across both wings continuous, purplish black.

♀. Paler, larger, discal band of *upperside* rather broader.

*Hab.* Nyassaland. In the Tring Museum 2 ♂, 2 ♀ from: Zomba, December 1895 (Dr. Percy Rendall); Chipaika Estate, Bandawe (F. Watkinson).

The individuals from Angola belong to the following subspecies, but are partly intermediate.

b. *Ch. nichetes nichetes*.

*Charaxes nichetes* Smith, *Ent. Mo. Mag.* XX. p. 58 (1883) (♂, ♀, Cameroons); id. & Kirby, *Rhop. Exot.* I. *Charaxes* t. 4. f. 1. 2. 3. ♂, ♀ (1890); Weym., *Stett. Ent. Zeit.* p. 120. n. 11 (1892) (*ogowensis* = *hamatus* = *nichetes*); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 372. n. 60 (1896) (Cameroons); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 244. n. 69 (1899) (pt.; Cameroons; Ogowé R.; Kassai).

♂. *Charaxes hamatus* Dewitz, *Ent. Nachr.* X. p. 285. fig. (1884) (N. Angola); id., *Nor. Act. Leop. Car. Ak. Naturf. L.* 4. p. 372 (1887) (N. Angola, XII.).

♂. *Charaxes ogowensis* Holland, *Trans. Amer. Ent. Soc.* XIII. p. 330. t. 8. f. 2 (1886) (Ogowé R.).

♂. Darker than *leoninus*, the red purple gloss stronger; discal band of *upperside* considerably wider, on forewing touching the round median spots or even extending further basad, on hindwing twice the width of the band of *leoninus*, cell and area behind cell shaded with purplish brown.

*Underside*, discal line less continuous and less black than in *leoninus*.

♀. *Upperside* of wings more shaded with black than in ♂, black discal band broader.

*Hab.* Cameroons; Ogowé R.; Congo; Kassai; Angola. In the Tring Museum 6 ♂♂ from: "West Africa"; Congo: Leopoldville, Bumba, Congo, 10. vi. '99 (Dr. Ansorge); Bolombo R., Angola, 28. iv. '99 (Penrice).

ℓ°. Cell-bar 4 of forewing below proximal of point of origin of M<sup>1</sup>.

q<sup>7</sup>. Underside with a continuous line across both wings.

g<sup>3</sup>. Forewing falcate, line across forewing below gently curved, bars in outer half of hindwing below indistinct.

84. *Charaxes paphianus* (Nov. Zool. VI. t. 8. f. 1. ♀).

*Charaxes paphianus* Ward, *Ent. Mo. Mag.* VIII. p. 120 (1871) (Cameroons); Auriv., *Ent. Tidskr.* XV. p. 311. n. 198 (1894) (Cameroons, VI. X. XI.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 402. n. 154 (1896) (S. Leone; Cameroons; Angola); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 242. n. 62 (1899) (S. Leone; Ashanti; Togo; O. Calabar; Cameroons; Ogowé; Quango; Mukenge; Aruwimi; Angola).

*Philognoma falcata* Butler, *Lep. Ex.* p. 101. t. 38. f. 1. ♂ (1872) (Gold Coast; Ashanti); Smith, *Proc. Zool. Soc. Lond.* p. 472. n. 91 (1890) (Aruwimi).

*Palla falcata*, Kirby, *Cat. Diurn. Lep.* p. 749. n. 6 (1877) (Afr. occ.); Staud., *Exot. Tagf.* p. 174. (1886) (Angola); Dewitz, *Nor. Act. Leop. Car. Ak. Naturf. L.* 4. p. 372 (1887) (Angola, Jan.).

♀. *Palla hamulosa* Weymer, *Stett. Ent. Zeit.* LIII. p. 94 (1892) (Gold Coast).

*Charaxes falcata*, Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 192. n. 58 (1893) (Togo); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 402. n. 153 (1896) (Ashanti; O. Calabar).

♂♀. Body as in *Ch. lichas*, but *below* much deeper brown.

♂. *Wings, upperside*, yellowish tawny orange, paler than in *Ch. lichas*, with a reddish purple gloss in side-light.—Forewing: outer margin concave from SC<sup>4</sup> to M<sup>2</sup>, apex produced; cell-bars 3 and 4 generally vestigial behind SC, bar D<sup>3</sup> thin; median bars R<sup>3</sup>—M<sup>2</sup> seldom traceable, but shining through from below, median bar R<sup>2</sup>—R<sup>3</sup>  $\frac{1}{3}$  to 1 mm. from cell, sometimes merged together with bar D<sup>3</sup>, median bars SC<sup>5</sup>—R<sup>2</sup> represented by two patches which are rounded distally, occasionally produced basad to cell; three discal spots SC<sup>5</sup>—R<sup>1</sup>, the upper one large, generally completely merged together with the black apical area; a black marginal band narrowing behind, mostly not extending to hinder angle of wing, dilated basad from R<sup>1</sup> or SC<sup>5</sup>, the black scaling seldom reaching to apex of cell or further down SC; three postdiscal spots R<sup>2</sup>—M<sup>1</sup> either small and isolated, or



partly or totally merged together with the marginal band, in which case the latter appears dilated between the veins.—Hindwing: median bars  $C-R^1$  more or less vestigial, discal bar  $C-SC^2$  also visible; postdiscal bars generally very feebly marked, often absent, except bar  $C-SC^2$ , which is mostly present; the bars concave distally, seldom joined at ends to the submarginal ones, which are concave proximally; the lower submarginal bars generally very short and feeble, sometimes obsolete, the upper ones a little heavier at internervular folds, bar  $C-SC^2$  heavy, extended to margin of wing, mostly merged together with the postdiscal bar at the veins; admarginal line vestigial, especially between  $SC^2$  and  $R^3$ ; abdominal fold yellowish buff.

*Underside* burnt umber brown, faintly ochreous here and there in submedian and discal interspaces; glossy, except in submarginal region of forewing posteriorly and in marginal region of hindwing; median interspaces of both wings slightly deeper in tint, band-like; bars thin, subbasal to median ones thinly edged white; a line beginning at costal margin of forewing near apex, crossing  $M^2$  7 mm. from its base,  $C$  of hindwing 7 mm. from its tip,  $M$  a little proximally of, or at, base of  $M^1$ , and ending at abdominal margin 3 mm. from end of  $SM^2$ , the line is dark mummy or walnut brown, gently curved on forewing, straight on hindwing, with a rather indistinct, thin, greyish proximal border.—Forewing: basal third or fourth of costal margin white; no basal cell-spot, cell-bar 2 concave proximally, bar 3 represented by two dots of about equal size, bar 4 very slightly oblique, a little distal of base of  $M^2$ , in most specimens distinctly angled in middle, the angle pointing distad; bar  $D^3$  very thin; submedian bar  $M^2-(SM^1)$  just before base of  $M^2$ , not continuous with cell-bar 4; median bars  $M^2-SM^2$  concave distally, bars  $R^3-M^2$  much less so, mostly straight, much more proximal than in *Ch. lichas*, bar  $R^3-M^1$  continuous with bar  $R^2-R^3$ , or a little more proximal, median bars  $SC^3-R^2$  forming a proximally concave line which is, at  $R^2$ , 6 mm. distant from cell; two oblique discal bars  $SC^4-R^1$ , the second mostly obsolete, the first also occasionally absent, both pointing distad with hinder end, the one appearing as continuation of the other; postdiscal bars triangular, tip of angles pointing distad, but mostly the tip alone clearly marked as a black dot; glossy grey scaling near margin rather more obvious than on disc.—Hindwing: costal basal and subbasal bars absent, subbasal bar  $C-SC^2$  also not marked; cell-bar 2 concave proximally; submedian and median bars forming two regularly curved, parallel, lines which are not, or slightly, broken at the veins, the median line either touching in middle the straight, discal, band-like line, or up to 2 mm. distant from it; postdiscal bars very faint, concave distally; submarginal bars also feebly marked concave proximally, bordered distally with white lines or dots, both the postdiscal and submarginal series parallel to outer margin, much less broken at  $R^2$  than in *lichas*; admarginal line obsolete; outer margin of wing more triangular than in *Ch. lichas*, tail longer.

♀. *Wings above* yellow ochraceous, more tawny ochraceous distally and at base.—Forewing: median bars  $R^2-M^2$  close to cell, bars  $SC^5-R^2$  as heavy as in ♂, discal bars  $SC^6-M^1$  present, sometimes also bar  $SC^4-SC^6$  isolated, bars  $R^2-M^1$  more proximal than the upper ones; a complete postdiscal series of patches, upper three more distal than the four others, size variable; admarginal band also variable in width, the markings at apex of wing more or less merged together (as in figure), or more or less isolated.—Hindwing: median bars  $C-R^2$  more or less vestigial, as is bar  $D$ ; discal line well marked down to  $R^1$ , then vestigial; postdiscal

spots concave distally, larger than in ♂, submarginal bars also heavy in most examples.

*Underside* much paler than in ♂, pinkish buff, shaded with clay colour, markings as in ♂, veins more obviously green.

Length of forewing : ♂, 27—32 mm.

" " ♀, 33 mm.

Clasper similar to that of *Ch. lichas*, but the tooth before the apex is more dorsal, appearing as process of the dorsal edge of the clasper ; penis-funnel shorter than in *lichas*, more suddenly narrowed, apical rod-like portion thinner ; penis with the teeth more dispersed.

*Hab.* West Africa from Sierra Leone to Angola and the Upper Congo and Aruwimi Rivers. In the Tring Museum 12 ♂♂ from : S. Leone ; Kumassi to Cape Coast Castle, iv. '99 (Capt. Giffard) ; Lukolele, Congo ; Sakarumbi, one day's march from Ft. Beni, Congo Free State, 5. v. '99 (Dr. Ansorge).

♂. Forewing not falcate, line across underside of forewing not curved, bars in outer half of hindwing below distinct.

### 85. *Charaxes lichas*.

♂. *Philognoma lichas* Doubleday, in Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. t. 49. f. 3. ♂ (1850).

♂♀. Head, pro- and mesonotum olive tawny, the last in ♀ more olive buff, metanotum and abdomen tawny (♂) or ochraceous (♀), palpi and antennae brown, four white dots on head, and a short line behind eye white, occasionally a double dot before antennae ; *underside* buff in ♂, creamy buff in ♀.

♂. *Wings, upperside*, tawny orange, with a strong reddish purplish sheen in side-light.—Forewing : in the darkest specimens apical half black, this area reaching cross-veins and extending basad at costal margin, often entering upper angle of cell, at M<sup>1</sup> the area is suddenly narrowed to a marginal band of 3 to 4 mm breadth, which reaches down to internal margin, the edge of the margin remaining generally tawny orange ; the area includes in many specimens some tawny orange spots, namely, a discal interstitial spot R<sup>2</sup>—R<sup>3</sup> close to cell, often completely merged together with the basal area, two discal spots SC<sup>5</sup>—R<sup>2</sup> about 6 to 7 mm. from cell, a discal spot R<sup>3</sup>—M<sup>1</sup> 4 mm. from base of M<sup>1</sup>, two postdiscal spots R<sup>1</sup>—R<sup>3</sup> 4 mm. from outer margin, and two postdiscal spots M<sup>1</sup>—SM<sup>2</sup>, the latter subdivided, all these spots or some of them often absent ; occasionally there is a submarginal spot M<sup>2</sup>—SM<sup>2</sup> present, in which case the admarginal, submarginal and postdiscal bars M<sup>2</sup>—SM<sup>2</sup> are recognisable ; median bars R<sup>3</sup>—M<sup>2</sup> often vestigial ; in the palest specimens the discal and upper postdiscal tawny spots are merged together with the basal area, in which case the black area is much reduced ; outer margin concave between R<sup>2</sup> and SM<sup>2</sup>.—Hindwing : postdiscal and submarginal bars thin, black, the postdiscal ones curved distad at ends, joining the submarginal ones, which are straight or very slightly curved, thus forming more or less halfmoon-shaped rings, ring-spot R<sup>2</sup>—R<sup>3</sup> small, posterior postdiscal bars often, the submarginal ones seldom, obsolete ; a thin but mostly very distinct admarginal line black, interrupted at veins R<sup>2</sup>—SM<sup>2</sup>, posterior bars sometimes obsolete ; admarginal interspace C—SC<sup>2</sup> often black, this black scaling not seldom extending basad to the vestige of discal bar C—SC<sup>2</sup> ; median bar C—SC<sup>2</sup> sometimes vestigial, as is in some specimens also

median bar  $SC^2-R^1$ ; basal half or two-thirds of abdominal fold orange buff, paler towards base.

*Underside* ochraceous; median, and greater part of discal, interspaces of both wings and postdisco-marginal area of forewing down to  $M^2$  densely shaded with brown scaling which varies from burnt umber colour to cinnamon rufous, the other interspaces also partly shaded with such scaling, but cell of forewing up to bar 4, basi-submedian interspace  $M-SM^2$ , a spot at outside of each median bar of the same wing, and the submedian and postdiscal interspaces of hindwing more or less pure ochraceous, sometimes whitish, especially the discal spots and submedian interspace of cell of hindwing; the latter wing often also with conspicuous creamy white spots at outside of median bars, spot  $R^2-R^3$  almost silvery white in some specimens; bars black, or tawny, without white edges.—Forewing: costal margin white or ochraceous at base, with a black dot 11 mm. from base, a second black mark in front of cross-veins; no basal cell-spot, cell-bar 2 convex distally, bar 3 separated into a number of dots, bar 4 straight, obliquely placed, hooked at extreme upper end, continuous with submedian bars  $M^2-SM^2$ , the line crossing  $M$  exactly at point of origin of  $M^2$ , cell-folds brown apically; median bars  $SC^3-R^2$  continuous, forming a nearly straight line 5 mm. from apex of cell, median bars  $R^2-SM^2$  deeply concave distally, bar  $R^2-R^3 \frac{1}{2}$  to 2 mm. from cell, bar  $R^3-M^1$  more distal than bars  $M^1-SM^2$ , which are continuous or nearly so; a straight or slightly curved brownish black line from costal to internal margin,  $4\frac{1}{2}$  mm. from outer margin at  $SC^4$ , 10 mm. at  $SM^2$ , partition  $SC^3-SC^4$  pointing obliquely basad, part  $SC^3-R^1$  represents apparently the postdiscal bars, while the rest is homologous to the discal bars, at proximal side of line there is glossy white scaling in costal region; discal bars  $SC^4-R^1$  concave distally, bar  $SC^3-R^3$  touching at  $R^1$  the postdisco-discal line, the two bars, taken as a whole, at right angles to costal margin; postdiscal series of thin bars very irregular, the bars arrowhead-shaped, pointing distad upon internervular folds, bar  $R^3-M^1$  generally less obvious than the others, often not visible, the cellule being scaled brown; a submarginal series of rather obscure, distally convex bars, bar at internal margin more proximal; upper admarginal interspaces more or less white.—Hindwing: basal costal bar curving distad, often reaching end of  $PC$ ; no costal subbasal bar, subbasal bar  $C-SC^2$  also often absent; submedian bars more or less concave proximally, upper ones straight in specimens with darker *underside*, the series crossing  $M$  just at point of origin of  $R^1$ , bar  $M^1-(SM^1)$  nearer base of  $M^2$ , 1 to 2 mm. distant from cell-bar 4, submedian bars  $(SM^1)-SM^3$  absent, but a bar behind  $SM^3$ , curving basad; median bars continuous (or almost so) from costal margin to  $R^1$  or  $R^2$ , the line oblique, parallel to submedian line of bars, reaching  $R^2$  2 mm. from bar  $D$ , continuous with the submedian line of the forewing, bars  $R^2-(SM^1)$  concave distally, bars  $(SM^1)-SM^3$  continuous, reaching  $SM^3$  3 to 4 mm. before its end; discal bars fused together to a distally sharply defined, brownish black, straight line, which is the continuation of the line of forewing, crossing  $C$  9 mm. from end,  $M$  at point of origin of  $M^1$ , and ending at abdominal margin near anal angle, discal interspace as on forewing glossy, median bar  $R^3-M^1$  outside that line (or is this bar a discal one, median bar  $R^3-M^1$  being part of the line?); postdiscal bars angulated at internervular folds, the angles pointing basad, bar  $R^2-R^3$  more evenly concave, bars  $C-R^2$  more proximal than the others, the series nearly parallel to outer margin, anteriorly and posteriorly approaching the discal line very closely; submarginal bars transverse, about 2 mm. from edge of wing, not abbreviated,



upper three somewhat concave distally, the others straight, continuous, the series suddenly 2 or 3 mm. more distal behind  $R^2$ , last one or two partly bordered white distally; admarginal line dark tawny, bordered white at anal angle; fringe with some white scales midway between veins; outer edge of wing, taken as a whole, triangular, produced into a blunt triangular tail at  $R^3$ , and into a blunt tooth at  $M^2$ , anal angle rounded, not produced.

♀ *Wings above* yellow buff, a little more ochraceous towards base.—Forewing: bar  $D^3$  thin, brown, median bars more or less vestigial, sometimes blackish, in the same position as below; discal line either shining through from below, or slightly marked by brown scales; postdiscal bars  $M^1$ — $SM^2$  brown, biconcave distally if well marked; submarginal bars concave proximally, interspace between them and edge of wing dark brown, or tawny, this colour mostly extending to vestiges of discal bars  $SC^4$ — $R^1$ ; outer edge of wing slightly convex.—Hindwing: postdiscal and submarginal bars wider apart than in ♂, therefore the rings formed by them larger, centres of wings assuming sometimes a creamy tint, posterior submarginal bars often obviously bordered white distally.

*Underside* almost uniformly buff or creamy buff, very much less particoloured than in ♂, the creamy buff specimens have outside the discal line two brown patches on forewing, one between  $R^3$  and  $M^1$ , the other at internal margin, and one patch in centre of hindwing; tail broader than in ♂.

Length of forewing: ♂, 29—31 mm.

“ “ ♀, 33—35 mm.

Clasper produced into a slender, long, gently curved apical hook, which is not scaled and bears on the outside a tooth which points distad; tenth tergite rounded, slightly sinuate mesially; penis thin, a patch of teeth about  $1\frac{1}{2}$  mm. before end dorsally on the left side, one dorsal tooth just before end.

Neuration:  $D^3$  of hindwing reaching M in both sexes about midway between  $M^1$  and  $M^2$ .

*Hab.* West Africa from S. Leone to Angola, the Upper Congo and German East Africa.

#### a. *Ch. lichas lichas.*

*Philognoma lichas* Donbleday, in Doubl., Westw. & Hew., *Gen. Diurn. Lep.* 11. t. 49. f. 3. ♂ (1850) (*hab.?*); Lucas, in Chenu, *Enc. d'Hist. Nat., Pap.* p. 154. f. 299 (1852) (Ashanti).

*Pallu lichas*, Mabilie, *Bull. Soc. Zool. Fr.* I. p. 281 (1876) (Congo); Dewitz, *Nov. Act. Leop. Cur. Ak. Naturf.* L. 4. p. 372 (1887) (Mukenge, I. II. IV.); Weym., *Stett. Ent. Zeit.* LIII. p. 93. n. 10. ♀ (1892) (Gold Coast); Schaus & Clements, *Sierra Leone Lepid.* p. 9 (1893).

*Charaxes lichas*, Butler, *Journ. Linn. Soc. Lond.* XXV. p. 401. n. 152 (1896) (S. Leone; Ashanti; Accra; O. Calabar; Cameroons; Angola); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 242. n. 61 (1899) (S. Leone to Angola).

♂. *Wings above*.—Forewing: black area extended to cell, sometimes the tawny postdiscal spots  $R^1$ — $R^3$  joined to the tawny basi-discal area, but in this case the veins  $R^1$ — $R^3$  black, except immediately at cell; no tawny submarginal spots between  $R^2$  and  $M^1$ .

♀. As described above.

*Hab.* Sierra Leone to Angola and the Lower Congo. In the Tring Museum 28 ♂♂, 5 ♀♀ from: Sierra Leone, 21. vii. '88; Ashanti; Accra; R. Ogowé; Lukolele, Congo.

One of the two Ogowé examples in the Tring Museum leads over to the next form.



**b. *Ch. lichas bebra* Rothsch., subsp. nov.**

♂. *Wings above*.—Forewing: black colour reduced; discal tawny patches  $SC^{4,5}$ — $R^3$  completely fused together with the tawny area, the black marginal area only 3 to 4 mm. wide between  $R^1$  and  $R^2$ , tawny postdiscal interspaces  $R^2$ — $M^1$  marked, or at least interspace  $R^3$ — $M^1$ , hence the black postdiscal patch  $R^2$ — $M^1$  not completely merged together with the black wing border.

♀. Unknown.

*Hab.* Great Forest of the Upper Congo: Diapanda, six days' march from Ft. Beni (*type*), 10. v. '99; and on the 7th, 10th, and 11th day during the march from Ft. Beni to the Ituri R., the 11th, 14th, and 15th of May 1899 (Dr. Ansorge); 5 ♂♂. A ♂ in Dr. Standinger's collection from the Pangani steppe, German East Africa (R. v. Benningsen).

♂. Underside of wings without a continuous line across discs.

**86. *Charaxes jahlusa*.**

*Nymphalis jahlusa* Trimen, *Rhop. Afr. Austr.* p. 177. n. 102. and p. 341. t. 3. f. 5 (1862) (interior of S. Afr.).

♂♀. *Body above* tawny ochraceous, mesonotum somewhat olivaceous; head with a buff spot between the antennae, the usual four white dots, and a smaller dot at each side near eye close to the posterior spots, palpi black above, antennae black, tip tawny; *underside* white, creamy white or buff, anterior tibia, stripes on sterna underneath legs, and part of the hairs on metasternum blackish brown; abdomen with two series of brownish black patches which are generally merged together to a double streak which is broadest in ♂, the patches in ♀ often small.

♂. *Wings above* buffish orange, with black markings.—Forewing: cell-bar 3 represented by a dot, bar 4 well marked, somewhat S-shaped, being concave distally in upper half and proximally in lower half, sometimes interrupted, transverse, upper end not closer to cross-veins than lower end; bar D heavy; submedian bars  $M^1$ —( $SM^1$ ) a little distal of bases of veins  $M^1$  and  $M^2$  respectively, the second rounded, the first mostly linear; median bars  $SC^4$ — $SC^5$ , 5 mm. from cell, bar  $R^2$ — $R^3$  close to cell, often merged together with bar D, bar  $R^3$ — $M^1$  4 to 5 mm. from base of  $M^1$ , slightly inclining basad, bar  $M^1$ — $M^2$  a little more proximal, bar  $M^2$ —( $SM^1$ ) rounded, again a little more proximal, seldom followed by a short, small, bar ( $SM^1$ )— $SM^2$ ; discal bars  $SC^4$ — $R^2$  triangular, patch-like, concave distally, more or less obviously joined along veins to postdiscal bars, discal bars  $R^2$ — $M^2$  gradually less distinct, bars  $R^3$ — $M^2$  often scarcely traceable; postdiscal bars halfmoon-shaped, contiguous, all produced along veins to outer margin, separating buffish orange admarginal spots from the discal area, posterior admarginal spots halfmoon-shaped, upper ones elongate triangular, spot  $SC^4$ — $SC^5$  often wanting; a thin black marginal line; fringe white between veins; outer margin deeply concave in middle.—Hindwing: a series of short median bars, bars C— $R^1$  almost continuous, or bar  $SC^2$ — $R^1$  more proximal, bars  $R^1$ — $R^3$  close together, in front of point of origin of  $M^1$ , bar  $R^3$ — $M^2$  sometimes vestigial, never clearly marked, in many specimens the median bars obsolete; one discal bar C— $SC^2$ , often merged together with the median bar C— $SC^2$ , a spot in cell and larger spots at outer side

of bars paler orange; postdiscal bars heavy, halfmoon-shaped, continuous, joined along veins to the thin, transverse, submarginal bars, isolating transverse, linear or ovate, pale orange spots, upper ones of these spots often absent; admarginal black line continuous; admarginal pale orange interspaces continuous, very seldom interrupted between  $M^1$  and  $M^2$ , shaded with olive buff at anal angle; fringe white between veins.

*Underside*, discal interspace  $SC^3-R^0$  proximally, postdiscal interstitial spots  $SC^1-R^1$  of forewing, submedian interspace  $C-SC^2$ , a spot in cell, abdominal area, proximal part of discal interspaces, and some postdiscal and submarginal spots of hindwing silvery white, apical half of forewing and submarginal area of hindwing more or less shaded over with silvery grey; veins green.—Forewing: pale rufous, apex down to  $R^3$  olive or cinnamon, bars short but heavy; no basal cell-spot, cell-bar 2 mostly abbreviated anteriorly with a black spot in front before  $C$ , bar 3 abbreviated posteriorly, mostly reduced to a dot at  $SC$  which is often followed by a smaller dot, cell-bar 4 and bar  $D$  as above; submedian bars heavier than above; median ones rather thinner, bars  $SC^3-R^1$  much smaller than bars  $R^3-M^2$ ; a discal series of thin bars from  $SC^3-SM^2$ , posterior ones vestigial, bar  $R^1-R^2$  more distal than the others, generally with a rufous spot at outside, while bars  $R^2-M^1$  are more or less obviously bordered white; the series followed by postdiscal bars of which bars  $M^1-SM^2$  are heavy, transverse, while the others are vestigial; admarginal rufous interspaces isolated, upper ones minute.—Hindwing: olive to cinnamon; basal, submedian and median costal bar short, dot-like, basal one widely separated from  $PC$ ; subbasal bar  $C-SC^2$  a dot; cell-bars 2 and 4 joined together, their hinder portions forming a ring which is filled up with silvery white, middle fold of cell black, this line connecting all the bars; submedian bar  $C-SC^2$  concave proximally, about 3 mm. from base of  $R^1$ , subbasal and submedian bars  $M^2-SM^2$  generally merged together to two rings with white centres, no subbasal and submedian bars  $SM^2-SM^3$ , but two separate bars often present behind  $SM^3$ ; median bar  $SC^2-R^1$  much more proximal than the median bars before and behind it, bar  $R^3-M^1$  more distal than bar  $R^2-R^3$ , bar  $M^2-(SM^1)$  2 to 3 mm. distant from bar  $M^1-M^2$ , bars  $(SM^1)-SM^3$  reaching  $SM^3$  near, or at, its end; discal, postdiscal, submarginal, and admarginal bars rather close together, thin, transverse, postdiscal interspace  $SC^2-R^1$  larger than the others, white, the other postdiscal interspaces rufous ochraceous, but interspace  $R^3-M^1$  often white; submarginal interspaces pinkish white, posterior ones wider than upper ones, submarginal bars mostly bordered white distally, upon these white borders follow the admarginal bars, which, however, are often absent; admarginal interspaces rufous ochraceous; marginal line black, partly glossy grey; internervular folds in distal and abdominal areas deeper in tint than ground of wing; outer margin scalloped, tails thin, triangular, acute, 3 to 4 mm.

♀. Larger than ♂, hindwing much less triangular, apex of forewing less produced. *Wings above* paler, being ochraceous with a slight reddish orange tone; black markings the same, but the submarginal and admarginal interstitial spots rather larger. *Underside* as in ♂, slightly paler, the silvery markings comparatively smaller, the grey scaling reduced; tails slender, somewhat longer than in ♂, upper one less pointed.

Length of forewing : ♂, 23—27 mm.

♀, 26—33 mm.

Clasper rather broad at the end, which is so twisted that the inner surface is

almost horizontal, tip pointed but short; tenth tergite short, rounded, with the vestige of a mesial sinus; penis-funnel long, slender, gradually narrowing towards the end, which is almost rod-like and forms a compressed hook the tip of which points somewhat proximad; penis short, swollen about 1 mm. before the end, with a dorsal row of teeth which turns towards the left side proximally.

*Hab.* East Africa from the Cape Colony to Nyassaland.

#### a. *Ch. jahlusa jahlusa*.

*Nymphalis jahlusa* Trimen, *Rhop. Afr. Austr.* p. 177. n. 102. and p. 341 (1862) (interior of S. Afr.; Grahamstown; Bashee R.; non Zambesi); Gooch, *Entom.* XIV. p. 6 (1881) (Natal); Kirby, *Cat. Diurn. Lep.* p. 273. n. 53 (1871) (Afr. mer.); Wallengr., *Öf. Vet. Ak. Förh.* XXXII. 1. (1875) (Transvaal).

*Charaxes jahlusa*, Butler, *Proc. Zool. Soc. Lond.* p. 637. n. 59 (1865) (pt.; Cap. b. sp.); Trim. & Bowk., *S. Afr. Butt.* I. p. 325. n. 106 (1887) (Cape Col.; Caffraria; non Zambesi); iid., *l.c.* III. p. 407. (1889) (Barberton, V.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 371. n. 57 (1895) (Cap. b. sp.; Natal); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 240. n. 50 (1899) (Cape Col.; Caffraria; Natal; Transvaal).

♂. Abdomen *below* with two black streaks from base to end, more or less merged together in basal half. *Wings above*.—Forewing: cell-bar 4 and submedian bars well marked; discal and postdiscal interspaces mostly obviously paler than disc.—Hindwing: submedian and median bars C—SC<sup>2</sup> rather heavy and mostly merged together, seldom entirely separate; median bars SC<sup>2</sup>—M<sup>3</sup> more or less marked, seldom absent.

*Underside*.—Forewing: apical area olivaceous, shaded with white; postdiscal white spots SC<sup>4</sup>—R<sup>1</sup> obvious, the second ovate triangular, 1 to 1½ mm. long; cell-bar 4 and submedian bars nearly 1 mm. broad.—Hindwing: olive, abdominal area white or grey, seldom clayish; white patches in discal interspaces contiguous, patches M<sup>2</sup>—SM<sup>2</sup> or M<sup>2</sup>—SM<sup>3</sup> mostly well marked, the patches very often much larger than the olive distal portions of the discal interspaces; postdiscal, interstitial, white spot SC<sup>2</sup>—R<sup>1</sup> ovate, conspicuous.

♀. Abdomen *below* with two broad black lines which are partly merged together at base.

*Wings above*.—Forewing: submedian bars about 1 to 1½ mm. broad; black discal triangular patches SC<sup>4</sup>—R<sup>1</sup> well marked, mostly followed by some more patches; discal and postdiscal interspaces SC<sup>4</sup>—R<sup>1</sup> paler than disc.

*Underside* as in ♂, but white discal patches of hindwing comparatively (often absolutely) smaller; white postdiscal spot SC<sup>2</sup>—R<sup>1</sup> of hindwing often triangular.

*Hab.* Cape Colony; Natal; Transvaal. In the Tring Museum 19 ♂♂, 8 ♀♀ from: Grahamstown; Estcourt; found from middle of August to end of September, and in February. In a ♀ from Grahamstown the submedian and median bars M<sup>1</sup>—(SM<sup>1</sup>) of the upperside of the forewing are merged together to two broad streaks, median bar R<sup>3</sup>—M<sup>1</sup> is also enlarged to an elongate patch, while cell-bar 4, bar D and median bar R<sup>2</sup>—R<sup>3</sup>, and median bars SC<sup>3</sup>—R<sup>2</sup> form three more patches. In this individual, as well as in another from Natal, bar M<sup>2</sup>—(SM<sup>1</sup>) of the hindwing is present above.

#### b. *Ch. jahlusa argynnides*.

*Charaxes argynnides* Westwood, *Proc. Ent. Soc. Lond.* (2). III. p. 10 (1864) (Zambesi); Butl., *Proc. Zool. Soc. Lond.* p. 457 (1866) (*jahlusa* distinct from *argynnides*!); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 371. n. 58 (1896) (L. Nyassa; Shiré R.; L. Tanganyika; Zambesi).

*Charaxes jahluca*, Butler, *l.c.* p. 637. n. 59 (1865) (pt. ; Zambesi) ; Trim. & Bowk., *S. Afr. Butt.* I. p. 325. n. 106 (1887) (pt. ; Zambesi) ; iid., *l.c.* III. p. 407 (1889).

*Nymphalis jahluca* Trimen, *Rhop. Afr. Austr.* p. 341 (1866) (pt. ; Zambesi).

*Nymphalis jahluca* var. *argynoides*, Kirby, *Cat. Diurn. Lep.* p. 273. sub n. 53 (1871) (Zambesi).

*Charaxes jahluca* var. *argynoides*, Aurivillius, *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 240. sub n. 50 (1899) (Zambesi ; Nyassa ; Tanganyika).

♂ ♀. Black spots on *underside* of abdomen small, widely separated, not merged together to lines.

♂. *Wings above*.—Forewing : cell-bar 4 thin, separated into dots, often obliterated ; submedian bars small, sometimes obsolete ; median bars also thinner than in the southern form.—Hindwing : median bars SC<sup>2</sup>—M<sup>2</sup> seldom vestigial.

*Underside* : apical area of forewing, and the hindwing dark tawny olive, of a more tawny tone than in *jahluca jahluca*, both wings less shaded with white, bars obviously thinner, white discal patches of hindwing smaller than in most specimens of *j. jahluca* ; white postdiscal dots SC<sup>4</sup>—R<sup>1</sup> of forewing and SC<sup>2</sup>—R<sup>1</sup> of hindwing very small, mostly clayish.

♀. Differs from *j. jahluca* like ♂ ; moreover, brown discal patches SC<sup>4</sup>—R<sup>1</sup> of forewing above obsolete ; underside of hindwing olive tawny, apical area of forewing tawny cinnamon.

*Hab.* Zambesi ; Nyassaland ; Tanganyika. In the Tring Museum 3 ♂♂, 10 ♀♀ from Likoma, Nyassa, caught in March, June, July, August, Sept., Oct. (Rev. Dutton).

The basal costal spot of the hindwing below is absent in some specimens of both sexes, the bars behind SM<sup>3</sup> are also occasionally wanting.

r<sup>4</sup> Underside green, scaling obliterated, except a few spots.

### 87. *Charaxes eupale*.

*Papilio Plebejus Urbanus eupale* Drury, *Illustr. Exot. Ins.* III. p. 7. t. 6. f. 3. and Index (1782) (S. Leone).

*Papilio Nymphalis amasia* Fabricius, *Ent. Syst.* III. 1. p. 136. n. 419 (1793) ("Surinam" loc. err.!).

♂ ♀. Palpi *above*, head, pronotum and (generally) anterior part of mesonotum pale russet, antennae green, mesonotum clothed with greyish white and oil green hairs, metanotum with long greenish grey ones, abdomen greenish cream colour ; *underside* dirty white, rostrum oil green, legs and palpi, if denuded, also green.

♂. *Wings, upperside*, membrane oil green, basal half (or more) of forewing, and the hindwing scaled greenish white.—Forewing : basal area always extending beyond apex of cell, its outer edge at right angles to costal margin, mostly sinuate between veins ; a short brown bar upon upper cross-veins, often a vestige of a bar upon D<sup>3</sup> ; green outer area covered with brownish black scales, which stand generally denser near the outer margin of the wing and at the edge of the greenish white area.—Hindwing : a series of black submarginal spots, variable in size, often with white centres, spot C—SC<sup>2</sup> minute or absent, spot M<sup>1</sup>—M<sup>2</sup> small ; outer margin brown, this scaling often so extended as to include most of the submarginal spots, sometimes restricted to the very edge of the wing.

*Underside* green, with sparse white scaling which is here and there condensed to markings, especially to transverse, short, thin lines.—Forewing : cell generally



with a white band, which is outwardly bordered by a thin black line in many specimens, which line represents cell-bar 4, the band transverse, midway between  $M^1$  and  $M^2$ ; a vestige of a bar upon upper cross-veins; a median line of bars, from  $SC^3-R^2$ , 7 mm. from cell, and again from  $R^2-M^2$  or ( $SM^1$ ), this second portion of the line a little more proximal, the line very often obliterated, often with a band of white scaling at outside in which stands a brown patch between  $M^1$  and  $M^2$ , a smaller one before  $M^1$ , and occasionally a third, small, one behind  $M^2$ ; at the outside of these spots there are often vestiges of black discal bars; a black and white postdiscal dot  $SC^5-R^1$  3 mm. from outer margin, preceded in many specimens by a minute dot  $SC^4-SC^5$  somewhat nearer the margin; seldom there is a third dot before  $SC^4$ ; in few specimens the series is continued to  $M^2$ , dot  $R^3-M^1$  5 mm. from margin.—Hindwing: the white, linear, speckles represent partly the white borders of the bars of other *Charaxes*, a more obvious line in cell is doubtless homologous to the white proximal border of cell-bar 4 of other species; a white, ill-defined, sparsely scaled, band from costal to abdominal margin which includes more or less conspicuously marked brown spots, of which spot  $R^2-R^3$  is apparently always traceable; the band crosses  $R^3$  just at the bent, it is straight, begins 4 to 5 mm. from end of C and ends about 2 mm. from end of  $SM^2$ ; traces of postdiscal, white, interstitial lunules nearly always marked; a series of minute, black, submarginal dots edged with white, dots  $M^1-M^2$  and C— $R^1$  generally obsolete; tail  $R^3$  represented by a very short, broad tooth.

♀. Like ♂, a little larger, outer margin of forewing straighter, outer edge of basal area of forewing taken as a whole less straight.

Length of forewing: ♂, 25—34 mm.

“ “ ♀, 34—36 mm.

Clasper produced apically into a short hook beneath which there stands a long, slender, curved tooth; in a dorsal view the apex of the clasper appears to be bifid; the clasper is in structure intermediate between that of *Ch. etheocles* and that of *lichas*; penis-funnel short, compressed, almost truncate in a side view forming a strong hook; penis thin, without dentition; tenth tergite rounded triangular, not sinuate.

*Hab.* From Sierra Leone to Angola and Unyoro; Nyassaland; Brit. E. Africa.

#### a. *Ch. eupale eupale*.

*Papilio Plebejus Urbanus eupale* Drury, l.c.

*Papilio Nymphalis amasia* Fabricius, l.c.

*Nymphalis amasia*, Godart, *Enc. Méth.* IX. p. 389. n. 137 (1823) (Afr. occ.); Lucas, *Lep. Ex.* p. 129. t. 69. f. 3 (1835).

*Charaxes eupale*, Doubleday, *List Spec. Lep. Ins. Brit. Mus.* I. p. 111 (1844) (Ashanti); Butl., *Proc. Zool. Soc. Lond.* p. 638. n. 64 (1865) (S. Leone; Ashanti); id., *Cat. Diurn. Lep. descr. by Fabr.* p. 50. n. 1 (1869) (Ashanti); Druce, *Proc. Zool. Soc. Lond.* p. 413. n. 10 (1875) (Angola); Staud., *Exot. Tagf.* p. 171. t. 58. ♂ (1886) (Angola: Congo); Dewitz, *Nov. Act. Leop. Car. Ak. Nat. L.* 4. p. 371 (1887) (N. Angola, XII. I.); Capr., *C. R. Soc. Ent. Belg.* XXXIII. p. 126. n. 72 (1889) (Kassai); Godm. & Salv., in Jameson, *Story Rear Column* p. 440. n. 88 (1890) (Aruwimi); Rogenh., in Baumann, *Usambura* p. 327. n. 87 (1891) (N. Usuguru); Auriv., *Ent. Tidskr.* XV. p. 312. n. 204 (1894) (Cameroons, V. VI.); Reb. & Rogenh., in Baumann, *Massailand* p. 332. n. 101 (1894) (N. Urundi); Karsch, *Berl. Ent. Zeitschr.* XXXVIII. p. 192. n. 61 (1894) (Togo); Holl., *Proc. U. St. Nat. Mus.* XVIII. p. 753 (1895) (Brit. E. Afr.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 378. n. 80 (1896) (S. Leone; Ashanti; Accra; Cameroons; Angola); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 245. n. 75 (1899).

*Nymphalis eupale*, Doubleday, Westwood & Hew., *Gen. Diurn. Lep.* II. p. 310. n. 41 (1850) (S. Leone; Ashanti); Kirby, *Cat. Diurn. Lep.* p. 273. n. 56 (1871); Dewitz, *l.c.* XLI. 2. 2. p. 8 (1879) (Chinchoxo).

*Charaxes eupalis* (!), Smith, *Proc. Zool. Soc. Lond.* p. 472. n. 89 (1890) (Aruwimi).

♂. *Wings above*.—Forewing: greenish white area not reaching end of SM<sup>2</sup>, mostly remaining well separated from outer margin.—Hindwing: submarginal black dots conspicuous, outer edge of wing brown.

*Underside*: ochraceous and white cell-bar of forewing becomes small or disappears when the other markings vanish.

♀. Like ♂ in colour, outer edge of greenish white area of forewing not more than 3 mm. from the end of the cell anteriorly.

*Hab.* Sierra Leone to Angola, the Congo, as far east as Unyoro, and (?) the northern parts of British East Africa. In the Tring Museum 40 ♂♂, 2 ♀♀ from: Sierra Leone; Accra; Warri, ii. '96 (Dr. Roth); Cameroons; Stanley Pool to Lukolele; Bopoto; Great Forest of Upper Congo, two and three days' march from Ft. Beni, 6 and 7 v. '99 (Dr. Ansorge); Naso, Chagwe, iii. '98 (Dr. Ansorge); Kasokwa, Unyoro, 5. x. '97 (Dr. Ansorge); Buaia, Busiro, 24. iii. '99 (Dr. Ansorge); Port Alice, 5. iii. '97 (Dr. Ansorge); Bulluji, Unyoro, 7. vii. '97 (Dr. Ansorge).

#### b. *Ch. eupale dilutus* (Nov. Zool. VII. t. 7. f. 6. ♀).

*Charaxes eupale*, Butler, *Proc. Zool. Soc. Lond.* p. 720. n. 16 (1895) (Zomba).

*Charaxes eupale dilutus* Rothschild, *Nov. Zool.* V. p. 97. n. 3 (1898) (Zomba).

*Charaxes eupale ab. dilutus*, Aurivillius, *Könl. Vet. Ak. Handl.* XXXI. 5. p. 245. sub n. 75 (1899) (Nyassaland).

♂. *Wings above*: greenish white area of forewing extending to end of SM<sup>2</sup>; black submarginal dots of hindwing mostly obliterated, no distinct olive brown border to hindwing. *Underside*: white bar of cell of forewing large, not disappearing even if the other markings are nearly all absent.

♀. Greenish white scaling of *upperside* of both wings more extended than in the ♀♀ of *Ch. eup. eupale*, the black submarginal dots of the hindwing smaller, upper ones obliterated. *Underside*: the ochraceous and white mark in the cell of the forewing large.

*Hab.* Nyassaland. In the Tring Museum 1 ♂, 2 ♀ from: Zomba, xii. '95 (Dr. Percy Rendall), Chipaika Estate near Bandawa (Watkinson).

f. Median and submedian bars of both wings close together, fused to a narrow band; this band occasionally indistinct in species with tail M<sup>2</sup> spatulate.

♂. Underside of forewing with two large, yellow, postdiscal patches.

#### 88. *Charaxes nobilis* (Nov. Zool. VII. t. 7. f. 5. ♂).

*Charaxes nobilis* Druce, *Ent. Mo. Mag.* X. p. 13 (1873) (O. Calabar); Kirby, *Cat. Diurn. Lep.* p. 748.

n. 75 (1877); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 371. n. 56 (1896) (O. Calabar); Auriv.,

*Könl. Sr. Vet. Ak. Handl.* XXXI. 5. p. 240. n. 49 (1899) (O. Calabar; Barombi, Cameroons).

♀. *Charaxes agabo* Distant, *Proc. Zool. Soc. Lond.* p. 708. t. 54. f. 4 (1879) (Calabar).

♂ ♀. *Charaxes homerus* Staudinger, *Iris* IV. p. 132. t. 2 f. 1. ♂ (1891) (Barombi).

♂. *Body above* olivaceous black, abdomen cream colour, except first two tergites; four large and a small dot on head, a line behind eye, three dorsal and a lateral dot on prothorax, and two lateral dots on mesothorax, white.

*Underside*, palpi, middle of sterna, a broad oblique stripe on meso-, and a shorter and thinner one on metasternum, outside of middle and hinder tibiae, distal edges of tarsal segments, and the abdomen, white.

♂. *Wings, upperside*, black, olivaceous at base.—Forewing: outer margin deeply concave in middle, markings cream colour; a broad discal band, from  $R^3$  to internal margin, 14 mm. wide behind, 5 to 8 in front, partition  $R^3-M^1$  separated, the band continued by two spots  $SC^5-R^2$ , the upper one very small, mostly represented only by some bluish white scales, the second about 8 mm. from outer margin, 4 to 5 mm. long; a postdiscal spot  $SC^4-SC^5$ , occasionally vestigial, often followed by a second, smaller, postdiscal spot, a series of small, white, marginal dots, white scales restricted to fringe between  $SC^3$  and  $SC^5$ .—Hindwing: the greater part of the wing cream colour, basal black area only 4 to 5 mm. wide; black disco-marginal band with nearly straight proximal edge, of nearly even width (9 mm. at  $SC^2$ ) from C to ( $SM^1$ ), including two series of glaucous blue spots, submarginal spots more or less rounded, except upper one, second spot the largest, 2 by 3 mm., the admarginal spots transverse, divided or subdivided in sharply pointed triangular spots, upper ones generally absent, anal spot yellow; abdominal fold black beyond end of  $SM^3$ , the black scaling including a white, triangular, subanal patch.

*Underside*: black bars very heavy, joined together, interspaces silvery white, some yellow, others pale blue.—Forewing: costal margin black, the bands joined to it, a streak at base white; cell-bars and bar D merged together, leaving three rather small interstitial, white, spots, sometimes there is a fourth, minute, spot near base; submedian and median bars  $M^1-(SM^1)$  merged together isolating a white submedian streak behind basal partition of M and a triangular spot before base of  $M^2$ , median bar  $R^3-M^1$  merged together with the black cellular area, produced distad along  $M^1$ , bar  $R^2-R^3$  not separated from bar D, the cellule  $R^2-R^3$  completely occupied by a black streak from cell to discal bar, median bars  $SC^{4.5}-R^2$  10 mm. from cell, forming a short, broad, band, which connects the streak  $R^2-R^3$  with the costal border, median interspaces  $SC^{4.5}-R^2$  white; discal bars all present, forming a continuous band which is nearly parallel to outer margin, and is joined along the veins to the black postdisco-marginal band; discal interspaces  $SC^4-R^2$  white, not separated, discal interspace  $R^3-M^1$  touching the next with its dilated distal portion, the following three patches wider than above, cream colour, extended to base at  $SM^2$ ; postdiscal interspaces  $SC^4-M^1$  white, upper three nearly contiguous, the following two widely isolated, interspaces  $M^1-SM^2$  yellow, patch  $M^2-SM^2$  measuring 5 by 7 mm.; submarginal interspaces represented by one or two white dots near apex of wing, and three pairs of obliquely placed, bluish white, linear spots  $M^1-SM^2$  which are often joined to the white marginal dots, the latter rather larger than above.—Hindwing: basal and subbasal bars merged together to a black band of 3 mm. width, which is continuous with the three black lines upon veins ( $SM^1$ )— $SM^3$ , and with marginal line; submedian and median bars forming a band of 3 mm. width, crossing C 18 mm. from end of this vein joining line ( $SM^1$ ) and being continuous with disco-postdiscal band, portion ( $SM^1$ )— $SM^3$  connecting the black abdominal lines and isolating a white triangular patch near anal angle; there are sometimes traces of white interspaces in the median band; postdiscal and discal bars forming a third band, which is  $3\frac{1}{2}$  mm. broad between  $R^2$  and  $R^3$ , includes a series of thin, sometimes slightly curved, pale ochraceous, interstitial lines, the band crossing  $SC^2$  5 mm. from end, slightly angled upon  $R^2$ ; submarginal,

admarginal and marginal bars forming a fourth band, which is separated from the disco-postdiscal one by a series of submarginal interstices, upper six large, white, last two minute, bluish white, patch  $SC^2-R^1$  the largest, measuring 3 to 4 mm. in width; admarginal interstitial dots triangular, bluish white, occasionally fused together to bars, spots  $M^2-SM^2$  yellow, forming one bar which is dilated upon ( $SM^1$ ); vein  $C_{1+2}$  28 mm., ( $SM^1$ ) 28 mm. long,  $M^2$  from its base to tip of tail 23 mm., anal region less produced than in most *Charaxes*, the wing, therefore, less triangular; outer margin obtusely dentate, concave between tails, both tails slender, rather pointed, tail  $R^3$  5 mm., tail  $M^2$  4 mm. long.

♀. Unknown.

Length of forewing: ♂, 46—49 mm.

Clasper long, apex forming a hook, basal half of ventral margin thickened as in other species, but the upper edge of this part denticulated and, proximally of middle of clasper, produced into a heavier tooth which points distad, this armature similar to that of *Ch. fabius*; penis-funnel very broad and rounded; penis long, a series of dorso-lateral teeth about 3 mm. before end; tenth tergite deeply and triangularly sinuate, the two lobes into which it is divided pointed. Vein  $D^3$  of hindwing joining M between  $M^1$  and  $M^2$ .

*Hab.* West Africa: Old Calabar; Cameroons; Congo. In the Tring Museum 2 ♂♂ from: N'doro, Upper Ogowé R., and the Kassai. One ♂ in the Museum in Bruxelles from Abou-Mombesi-mongalla, Congo.

<sup>1</sup>. Underside of forewing with large, yellow, patches.

<sup>2</sup>. Postdiscal interspaces of forewing above (or the greater part of the wing) white.

<sup>3</sup>. Hindwing above with a black postdisco-marginal band.

#### 89. *Charaxes zoolina* (Nov. Zool. V. t. 9. f. 4—8. ♂♀).

*Nymphalis zoolina* Westwood, in Doubleday, Westw. & Hew., *Gen. Diurn. Lep.* t. 50. f. 1. ♀ (1850) (*hab.* ?); Trim., *Rhop. Afr. Austr.* p. 178. n. 103. ♀ and p. 341. ♂ (1862-65) (Natal).

♂♀. *Body above* mummy brown, sides of thorax cinnamon in ♂, olive grey or whitish in ♀; four white dots on head, two white dots behind eye, often joined together to a half-ring, followed by a lateral dot on prothorax; *underside* white, streaks on sterna underneath legs, upperside of anterior tibia and four posterior femora mummy brown, abdomen clay colour in ♂, cinnamon brown in ♀, with whitish scales in mesial line and at edges of segments, sometimes unicolorous.

♂. *Wings above* white, with a slight yellow green tint, faintly opalescent in side-light; a broad disco-marginal band, which on forewing extends to base at costal margin, black.—Forewing: cell-bar 3 often present as a patch, the whole cell sometimes shaded over with brownish black scales, but generally the interspace between cell-bars 3 and 4, seldom the whole cell, white; cell-bar 4 and bar D merged together to a narrow band which is not separated from the black costal border, the band continued in many specimens to  $M^2$ , sometimes to ( $SM^1$ ); black outer area more or less dentate upon veins, 4 to 6 mm. broad at  $SM^2$ , 9 to 11 mm. at  $R^3$ , including two greenish white discal spots  $SC^5-R^2$ , which are seldom absent, and a series of postdiscal spots which is parallel to margin, this series sometimes reduced to one dot between  $R^3$  and  $M^1$ , dot  $R^1-R^2$  very seldom present; white discal area mostly bordered in front by  $R^2$ , here  $2\frac{1}{2}$  to 5 mm. wide, seldom with two



small, elongate, spots in front between  $SC^{4.5}$  and  $R^2$ ; outer margin angled at  $SC^5$ , more obtusely so at  $M^2$ .—Hindwing: black disco-marginal border 5 to  $7\frac{1}{2}$  mm. broad at  $SC^2$ , 4 to 6 mm. at  $M^1$ , its inner edge nearly straight, sometimes slightly convex anteriorly; within the band there are two postdiscal interstitial lunules  $M^1$ — $SM^2$ , the upper olive buff, the second tawny or also more or less olive buff, sometimes produced at  $M^2$  to outer margin, a series of minute, white, submarginal dots, posterior two or three often bluish, upper ones occasionally absent; admarginal interspaces transverse, thin, ochraceous or tawny, often dilated at veins, posterior ones often olive buff at edge, upper ones seldom marked, sometimes all absent except interspaces  $M^2$ — $SM^2$ , an olive buff line in tail, often reduced; end of abdominal fold and ( $SM^1$ ) more or less extended brown.

*Underside* greenish white, the bars forming mummy brown, sharply marked, bands.—Forewing: costal margin mummy brown, with a white streak at base; base of cell mummy brown, cell-bar 3 transverse, 1 to  $1\frac{1}{2}$  mm. broad, a very little proximal of point of origin of  $M^2$ , joined along M to the brown basal patch, cell-bar 4 close to cross-veins, forming together with bar D, median bars  $R^2$ —( $SM^1$ ) and submedian bars  $M^1$ —( $SM^1$ ) a band of 2 to  $2\frac{1}{2}$  mm. width, which is slightly angled at lower angle of cell in many specimens, and shows generally more or less obvious white spots inside, which represent the median interspaces, white spot in upper angle of cell very seldom absent; median bars  $SC^4$ — $R^2$  merged together to a short band which is joined behind  $R^2$  to the rather broad discal band, the two bands together resembling the letter Y; discal band concave distally in middle, about 3 mm. broad at its widest point between veins, distally concave between veins, more or less black distally between  $R^3$  and  $SM^2$ ; postdiscal bars transverse, thin, but bars  $SC^3$ — $R^3$  larger, often not separated from the discal band; marginal border about  $1\frac{2}{3}$  mm. broad; vein  $R^2$  generally brown between cell and discal band; discal interspaces  $SC^4$ — $R^1$  also separated into spots by the brown veins; postdiscal interspaces halfmoon-shaped, spot  $SC^4$ — $SC^5$  thin, often obsolete, more proximal, the second ovate, the third shorter, fourth and fifth larger, often contiguous, the following ones smaller; submarginal interspaces transverse, thin, often nearly all obsolete, spots  $SC^3$ — $SC^5$  larger, appearing as a prolongation of the postdiscal series of interstitial spots.—Hindwing: costal margin thinly bordered brown at base, vein PC bordered brown at both sides, this brown band extended to costal margin and posteriorly prolonged across base of cell to join a longitudinal streak which runs from the base along ( $SM^1$ ) to the median band; the latter appears as a prolongation of the median band of forewing, is about 2 mm. broad, slightly concave behind distally, it crosses M just outside base of  $M^2$ , there being mostly a white dot left in the fork formed by M and  $M^2$ , it consists of the submedian and median bars which leave here and there a white interspace between themselves, at ( $SM^1$ ) the band touches (or nearly) the discal bar and then turns at a sharp angle to the end of  $SM^3$ , portion ( $SM^1$ )— $SM^3$  formed by the median bars only; discal bars thin, black, the series either straight, or distally concave between C and  $R^3$ , bars C— $R^3$  placed in a brown band which is often alone present, while bars  $R^3$ — $SM^2$  have brown scaling only between themselves at the veins, the white distal borders of the last bars very thin, while the borders have often developed to obvious transverse spots between  $SC^2$  and  $R^3$ ; postdiscal interspaces brown, posterior ones often yellowish, forming with the before-mentioned brown discal band one band in which are situated the discal and postdiscal black bars and the white borders of the discal bars; postdiscal black bars C— $R^3$  seldom faintly vestigial within the

brown band; submarginal black bars transverse, thin, posterior ones merged together with the postdiscal bars to black spots with white, or blue and white, centres, submarginal bars  $SC^2-R^3$  brown, submarginal interspaces  $C-R^3$  white, larger than the postdiscal ones, spots  $SC^2-R^2$  the largest, often rectangular and contiguous; marginal line thin, brown in front, black behind; admarginal transverse interspaces clayish ochraceous, upper ones shaded with white; veins  $R^3$  to  $SM^3$  more or less brown; outer edge of wing dentate at  $R^3$ , rounded in front but slightly sinuate between veins, concave behind, anal portion produced, anal angle very obtuse, tail obliquely spatulate.

♀. Larger than ♂, wings much broader; black markings reduced.—Forewing: costal margin brown, this brown scaling seldom penetrating into cell, but occasionally the basal half of cell covered over with brown scales; cell-bar 3 vestigial as a rule at  $SC$ , cell-bar 4 mostly merged together with bar  $D$  as in ♂, but sometimes reduced to a spot or absent; median bars  $SC^{4,5}-R^2$  mostly contiguous with the brown costal border, but otherwise isolated, in some specimens, however, connected behind  $R^2$  with the discal series of bars; discal interspaces  $SC^3-R^3$  large, seldom divided into patches; discal bars  $R^2-SM^2$  arched, often joined along veins to the black postdisco-marginal band, sometimes isolated, posterior ones not seldom obsolete, bar  $R^3-M^1$  6 to 9 mm., bar  $M^2-SM^2$  only 5 mm. from margin, bars  $SC^3-R^2$  completely merged together to black outer area, but there remain from one to three postdiscal greenish white interstitial spots, spots  $SC^1-SC^5$  and  $R^1-R^2$  small, spot  $SC^5-R^1$  larger and never absent; postdisco-marginal band  $3\frac{1}{2}$  to 4 mm. broad between  $R^2$  and  $R^3$ , 2 mm. at ( $SM^1$ ).—Hindwing: disco-marginal band concave in middle; white postdiscal interspaces  $R^1-SM^2$  halfmoon-shaped, upper ones seldom absent, discal arched bars  $R^1-SM^2$  mostly thin, occasionally obliterated; submarginal white interstitial spots  $C-R^3$  much larger than in ♂, spots  $SC^2-R^2$  often merged together, dots  $R^3-SM^2$  minute, with blue scales distally, the series suddenly broken at  $R^2$ , spots  $R^2-R^3$  being obviously more distal than spots  $C-R^2$ ; admarginal interspaces ochreous or ochraceous, often whitish at veins, upper ones separate, posterior ones more or less continuous, narrower between veins, the posterior submarginal black bars being distally more or less convex.

*Underside* similar to ♂, but the brown bands thinner, especially in disco-marginal area.—Forewing: discal brown band 7 mm. distant from outer margin between  $R^3$  and  $M^1$ , partition  $R^2-R^3$  often produced basad to join the band of median bars  $SC^3-R^2$ ; white postdiscal interspace  $R^3-M^1$   $3\frac{2}{3}$  to 5 mm. wide, postdiscal interspaces nearly all contiguous, the veins between them not being brown except upper ones.—Hindwing: postdiscal and submarginal white interstitial spots  $SC^2-R^3$  larger than in ♂, the brown bands correspondingly thinner; two spatulate tails, upper one shorter than second.

Length of forewing: ♂, 27–31 mm.

“ “ ♀, 32–38 mm.

Sexual organs of ♂ similar to those of *Ch. neanthes*.

*Hab.* East Africa from Natal to Abyssinia; Madagascar.

*a. Ch. zoolina zoolina* (Nov. Zool. V. t. 9. f. 4. 5. ♂ 6. ♀).

*Charaxes spec. nov.*, Angas, *Kafirs Illustr.* t. 30. f. 7. ♀. and expl. (1849) (Mulazi R.).

*Nymphalis zoolina* Westwood, in Doubl., Westw. & Hew., *Gen. Diurn. Lep.* II. t. 53. f. 1. ♀ (1850); Trim., *Rhop. Afr. Austr.* p. 178. n. 103. ♀. and p. 341. ♂ (1862-65) (Natal); Kirby, *Cat. Diurn. Lep.* p. 273. n. 54 (1871); Gooch, *Entom.* XIV. p. 6 (1881) (Natal); Oberth., *Ann. Mus. Civ. Genova* XVIII. p. 728. n. 62 (1883) (Shoa, Junne).

*Charaxes zoolina*, Butler, *Proc. Zool. Soc. Lond.* p. 638. n. 62 (1865) (Amazulu; Pt. Natal); Staud., *Exot. Tagf.* p. 171 (1886) (Natal; Del. Bay); Trim. & Bowk., *S. Afr. Butt.* I. p. 318. n. 103 (1887) (Caffraria; Natal); Trim., *Proc. Zool. Soc. Lond.* p. 38. n. 58 (1894) (Manica); Reb. & Rogenb., in Baumaun, *Massailand* p. 322. n. 100 (1894) (Kisuan; Ubugwe); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 370. n. 53 (1896) (Mamboia; Nguru; Kilimandjaro; Victoria Nyanza; Zambesi; Del. Bay; Natal; "Cameroons" *loc. err.!!*); Sbarpe, *Proc. Zool. Soc. Lond.* p. 533. n. 35 (1896) (Sheik Husein, Somaliland, IX.); Butl., *ibid.* p. 823. n. 15 (1896) (Upp. Shiré R., III.); Holl., *Proc. U. St. Nat. Mus.* XVIII. p. 262 (1896) (Brit. E. Afr.); Butl., *l.c.* p. 397. n. 9 (1898) (Brit. E. Afr.); Auriv., *Kongl. Sc. Vet. Ak. Handl.* XXXI. 5. p. 243. n. 64 (1899) (pt.; Caffraria; Natal; Del. Bay; Manica; Zambesi; Nyassaland; Mamboia; N'Guru; Kisuan; Kilimandjaro; Mkaramo; Vict. Nyanza; Brit. E. Afr.; Abyssinia; non Madagascar).

♂. Hindwing with a very short tooth at  $R^3$ ; on the *underside*, the submarginal, white, interstitial spots  $SC^5$ — $SM^2$  of the forewing all transverse, spots  $SC^5$ — $R^3$  thinner than the following ones, or at least not wider, spot  $SC^5$ — $R^1$  not rarely vestigial, black median bars  $SC^4$ — $R^2$  and discal bars  $SC^4$ — $R^3$  not marked as obvious black spots; discal black bars  $SC^2$ — $R^3$  of hindwing absent.

*Wings above* mostly a little more yellowish than in the Madagascar race.—Forewing: black median band always prolonged beyond  $M^1$ , mostly extended to  $M^2$ , not rarely to ( $SM^1$ ); cell sometimes all black, occasionally nearly all white; black disco-marginal area  $8\frac{1}{2}$  to 10 mm. broad behind  $R^3$ , 5 to 7 mm. before  $SM^2$ ; discal interstitial spots  $SC^{4.5}$ — $R^2$  seldom absent, the first the larger; postdiscal dots variable in size and number, dot  $SC^5$ — $R^1$  always present, while dot  $R^3$ — $M^1$  is often absent.—Hindwing: median band marked as a rule by black scales; white submarginal dots very variable, often represented only by a few white scales.

*Underside*: bands rather paler brown than in *Ch. z. betsimiseraka*.—Forewing: white subapical interspace of cell as broad as, or narrower than median band; white postdiscal interstitial spots  $R^2$ — $M^1$  obviously larger than the following ones, spot  $M^2$ — $SM^2$   $\frac{1}{2}$  to  $1\frac{1}{3}$  mm. broad, spot  $SC^4$ — $SC^5$  truncate or concave distally, smaller than postdiscal spot  $SC^5$ — $R^1$ .—Hindwing: submarginal white spot  $R^3$ — $M^1$  much smaller than spot  $R^2$ — $R^3$ , mostly reduced to a tiny bluish white dot; postdiscal white spots  $SC^2$ — $R^2$  larger than submarginal white spot  $R^3$ — $M^1$ , while in *betsimiseraka* the reverse is the case; distance from point of origin of  $M^2$  to end of tail 21 to 23 mm.

♀. Discal bars of forewing *above*, if not connected at veins with black border, thin, deeply concave, bar  $R^3$ — $M^1$  8 to 9 mm., and bar  $M^2$ — $SM^2$  5 mm. from outer margin; white postdiscal interspace  $R^3$ — $M^1$  two or three times as wide as interspace  $M^2$ — $SM^2$ . On the *underside*, the upper discal bars of both wings not marked as black spots; postdiscal white interspaces of forewing decreasing in width from  $R^3$  to  $SM^2$  as on *underside*; the brown discal band much more oblique from  $R^3$  to  $SM^2$  than in *betsimiseraka*; submarginal white spot  $SC^5$ — $R^1$  not wider than spots  $M^2$ — $SM^2$ ; submarginal white interstices  $SC^2$ — $R^2$  of hindwing larger than in that race, the brown postdiscal bars  $SC^2$ — $R^2$  not thicker than the respective white postdiscal spots, or thinner; length of  $M^2$  from its base to tip of tail 23 to 27 mm.



Length of forewing : ♂, 27—30 mm.

" " ♀, 32—36 mm.

*Hab.* Natal to Abyssinia. In the Tring Museum 16 ♂♂, 12 ♀♀ from : Natal, Delagoa Bay, Pembe and Rikatla. Germ. E. Afr. : Mikindani, Jan. to May. Brit. E. Afr. : Taveta, vi. ; Kibwezi, 7. iv. '94 ; Ndange, 1. iv. '95 ; Pt. Alice, Uganda, 6. vii. '94 (Dr. Ansorge). Somaliland : Sheik Husein, 5 to 7000 ft., 20. ix. '94, wet country (Dr. Donaldson Smith).

*b. Ch. zoolina betsimiseraka* (Nov. Zool. V. t. 9. f. 7. ♂. 8. ♀).

*Charaxes betsimiseraka* Lucas, *Ann. Sc. Nat.* (5). XV. n. 22. p. 2 (1872) (Madag.); Mab., in Grandid., *Hist. Madag. Lép.* I. p. 195. n. 9. t. 21. f. 2. 2a. ♂ (1885-87) (Mad. or.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 370. n. 54 (1896).

*Charaxes relatus* Butler, *Ann. Mag. N. H.* (5). V. p. 394. (1880) (Madag.); Mab., *l.c.* p. 196. n. 10. t. 21. f. 3. 3a. ♂ (1885-87); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 371. n. 55 (1896) (Ft. Dauphin).

*Charaxes zoolina*, Aurivillius, *Kongl. Sn. Vet. Ak. Handl.* XXXI. 5. p. 243. n. 64 (1899) (pt.; Madag.).

*Charaxes zoolina* var. (ab.?) *relatus*, Aurivillius, *l.c.* (Madag.).

♂. Hindwing produced into a heavy tooth at  $R^3$ ; the submarginal interstitial, white, spots of the *underside* of the forewing rounded, at least 1 mm. wide; black discal bars  $C-R^3$  of hindwing well-marked within brown band.—*Wings above*; black band at end of cell not continued to  $M^2$ , median bar  $M^1-M^2$  seldom vestigial; postdiscal interstitial spots variable in size and number, dot  $R^3-M^1$  is always the last to disappear; black disco-marginal band 7 mm. broad at  $M^1$ , 5 to 6 mm. at  $SM^2$ .—Hindwing: median band shining through from below, but not marked by brown scales.

*Underside*.—Forewing: black discal bars mostly all marked, median bars  $SC^4-R^2$  also vestigial; white postdiscal spots  $R^3-SM^2$  mostly about equal in width, but spot  $R^3-M^1$  sometimes wider, spot  $M^2-SM^2$  2 mm. wide; submarginal white spots all comparatively large, spots  $SC^5-R^3$  larger than the following ones, at least 1 mm. broad, spot  $SC^4-SC^5$  ovate, not concave distally, 3 mm. long.—Hindwing: series of black discal bars and their white outer borders straight or nearly so; submarginal interstitial white spots variable in size, spots  $SC^2-M^1$  in a straight line, or spots  $R^2-M^1$  a little more distal than spots  $SC^2-R^2$ ; line on tail continuous with anal admarginal spots; distance from point of origin of  $M^2$  to end of tail 24 to 25 mm.

♀. *Wings above*.—Forewing: cell-bar 4 absent; bar D thin; median bars  $SC^{4.5}-R^2$  isolated; discal bar  $R^3-M^1$  6 mm. from outer margin, about  $1\frac{1}{2}$  mm. thick, continuous with the other discal bars, bar  $M^2-SM^2$  vestigial, nearly 5 mm. from outer margin; postdiscal interspaces  $R^2-SM^2$  merged together, the veins not being black; black postdisco-marginal band 3 mm. broad before  $R^3$ , 2 mm. before  $SM^2$ .—Hindwing: whitish postdiscal lunules  $SC^2-M^2$  vestigial; admarginal interstitial, linear, spot  $SC^2-R^1$  absent, spot  $R^1-R^2$  thin.

*Underside*; black discal bars present on both wings.—Forewing: cell with a tiny white dot near base which almost separates cell-bar 2 from the brown basal scaling; cell-bar 4 separated from bar D by a white interspace which is as broad as the bars; postdiscal white interspaces  $R^3-SM^2$  nearly equal in width, interspace  $R^3-M^1$  a little wider than the others, measuring 4 mm.; submarginal interstitial spots  $R^1-SM^2$  gradually decreasing in size, spot  $R^1-R^2$  ovate.—Hindwing:



brown median band with obvious white spots ; white postdiscal interstitial spots C—R<sup>3</sup> small, spot R<sup>2</sup>—R<sup>3</sup> the largest ; white submarginal interstitial spots SC<sup>2</sup>—R<sup>2</sup> nearly 2 mm. broad, the brown postdiscal band separating them from the white postdiscal spots nearly of the same width behind SC<sup>2</sup> as those white submarginal spots ; distance from point of origin of M<sup>2</sup> to tip of tail 26 mm.

Length of forewing : ♂, 29—31 mm.

" " ♀, 34—37 mm.

*Hab.* Madagascar. In the Tring Museum 13 ♂♂, 1 ♀, partly from Morondawa.

Anrivillius, *i.e.*, remarks correctly that Mabille's figure of "*relatus* Butler" is drawn from a mutilated specimen. The differences between *relatus* and *betsimiseraka* are individual ; there is no absolute constancy of markings in any species.

r<sup>3</sup>. Black scaling of hindwing above reduced to a very thin marginal line between C and R<sup>3</sup>.

### 90. *Charaxes kahlden*i.

*Charaxes kahlden*i Homeyer & Dewitz, *Berl. Ent. Zeitschr.* XXVI. p. 381. t. 7. f. 1. ♂. 2. ♀ (1882) (Angola) ; Butl., *Journ. Linn. Soc. Lond.* XXV. p. 370. n. 52 (1896) ; Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 253. n. 63 (1899) (Kamerun ; Angola).

♂ ♀. *Body* above olive grey, anterior part of thorax, and head, olive cinnamon, four white dots on head, white line behind eye very thin, or divided into two dots. *Underside* white, streaks on breast underneath legs brown, abdomen with clayish spots.

♂. *Wings upperside*, white with a slight greenish tint, somewhat opalescent in side-light.—Forewing : costal margin brown proximally, brownish black distally ; bar D marked in front ; median bar SC<sup>5</sup>—R<sup>1</sup> represented by a black spot, varying in size, sometimes absent, 4 to 5 mm. from cell, occasionally preceded by a tiny dot ; discal bars R<sup>2</sup>—SM<sup>2</sup> continuous, posterior ones seldom marked, often all obsolete ; bars SC<sup>3</sup>—R<sup>2</sup> completely merged together with the black postdisco-marginal band, there being in the black apical area thus formed only one postdiscal white spot of variable size, while white postdiscal interspaces R<sup>2</sup>—SM<sup>2</sup> are not, or not obviously, separated from one another, there is sometimes a second small white spot at the distal side of discal bar R<sup>1</sup>—R<sup>2</sup> ; black postdisco-marginal band slightly concave between veins, 1½ mm. broad at (SM<sup>1</sup>) ; outer margin angled or rounded at SC<sup>5</sup>.—Hindwing : no median and discal bars, but there is sometimes a trace of one discal bar at abdominal margin close to anal angle ; postdiscal bars M<sup>2</sup>—SM<sup>2</sup> joined to the submarginal ones to form small rings close to the margin with pale blue centres, postdiscal bar M<sup>1</sup>—M<sup>2</sup> sometimes vestigial, while the submarginal bar M<sup>1</sup>—M<sup>2</sup> is marked as a transverse line, in some specimens the submarginal bars SC<sup>2</sup>—M<sup>1</sup> are also present ; a thin black marginal line ; anal admarginal interspace ochreous, tail black with a thin bluish white line.

*Underside* white, slightly greenish, a little glossy in side-light ; markings mummy brown.—Forewing : costal margin, to which a dot in middle of cell is joined, a median band situated as in *zoolina*, but rather thinner behind, mostly including white dot anteriorly, a median spot SC<sup>5</sup>—R<sup>1</sup> joined to the costal streak, 3 to 4 mm. from cell, a discal continuous band curved costad in front, about 1½ mm. wide in middle, thinner behind, 5 mm. from outer margin at R<sup>1</sup> and

2½ mm. at SM<sup>2</sup>, a series of very thin, often obsolete, postdiscal bars, close to marginal band, mmmmy brown; postdiscal interspaces not separated, submarginal ones thin, upper two enlarged, marginal band 1 to 1½ mm. broad.—Hindwing: bands nearly as in *zoolina*, vein M<sup>2</sup> outside the median band and veins M<sup>1</sup>, SM<sup>2</sup>, SM<sup>3</sup> not streaked brown, no white spots in median band; discal band straight, postdiscal bars thin, straight, joined to the discal band at veins, thus isolating thin white or buffish postdiscal lunules; white admarginal interspaces SC<sup>2</sup>—R<sup>3</sup> about as wide as, or wider than, disco-postdiscal band, spot R<sup>3</sup>—M<sup>1</sup> smaller, the others minute and pale blue or bluish white; submarginal bars SC<sup>2</sup>—R<sup>3</sup> very thin, often obsolete, bars R<sup>3</sup>—SM<sup>2</sup> black, joined to the black postdiscal bars; upper admarginal interspaces white, interspaces R<sup>3</sup>—M<sup>2</sup> obsolete, or ochraceous, anal interspace ochraceous; outer margin very slightly sinuate between upper veins, concave between R<sup>3</sup> and M<sup>2</sup>, with a short tooth at R<sup>3</sup>, anal angle less obtuse than in *zoolina*, tail rather slenderer.

♀. Larger than ♂, wings broader; white postdiscal interspaces of forewing above and below, and submarginal interspaces of hindwing larger; with two tails as in ♀ *zoolina*.

Length of forewing: ♂, 28—32 mm.

„ „ ♀, 34 mm.

Sexual organs resembling those of *Ch. zoolina*.

*Hab.* Congo Basin to Cameroons. In the Tring Museum 11 ♂♂ from the Forest of the Upper Congo, three and four days' march from Ft. Beni, caught by Dr. Ansorge on the 7th and 8th of May, 1899; Leopoldville.

ℓ<sup>2</sup>. Postdiscal interspaces (or the greater part) of the forewing above ochraceous or ochreous.

s<sup>3</sup>. Hindwing below, along abdominal fold, with a brown streak which joins distally the median band.

### 91. *Charaxes homeyeri*.

*Charaxes homeyeri* Dewitz, Berl. Ent. Zeitschr. XXVI. p. 382. t. 7. f. 3. ♂ (1882) (Angola); Butl., Journ. Linn. Soc. Lond. XXV. p. 370. n. 51 (1896); Auriv., Kongl. Sv. Vet. Ak. Handl. XXXI. 5. p. 243. n. 65 (1899) (Kamerun; Angola).

♂ ♀. Allied to *Ch. neanthes* and *zoolina*. Body above more or less white.—Wings above, basal half of forewing and three-fourths of hindwing white with a greenish yellow tint, nearly as in ♀ *Ch. neanthes betanimena*, then ochraceous to tawny.—Forewing: outer margin angled at SC<sup>5</sup>; disco-marginal area tawny; medio-discal area and costal margin ochraceous; median bars SC<sup>4</sup>—R<sup>3</sup> and bar D absent; postdiscal interstitial spots SC<sup>5</sup>—SM<sup>2</sup> marked.—Hindwing: discal series of bars closer to margin than in *neanthes*, more regular, much less concave between SC<sup>2</sup> and R<sup>3</sup>, bar C—SC<sup>2</sup> absent.

Underside as in *neanthes*, paler in ♀ than in ♂, but median band forming a very obtuse angle at base of M<sup>2</sup>, the angle pointing basad, and fused posteriorly with a brown streak of the width of the band situated upon (SM<sup>1</sup>) and extending down to base; outer margin evenly rounded, no distinct tooth at R<sup>3</sup>, tail as in *neanthes*.

Length of forewing: ♂, ♀, 30 mm.

*Hab.* Northern Angola.

*t*<sup>3</sup>. No brown streak along (SM<sup>1</sup>) of hindwing below.

*s*<sup>4</sup>. ♂, basal area of both wings white (♀ unknown).

## 92. *Charaxes ehmekei*.

*Charaxes ehmekei* Dewitz, *Berl. Ent. Zeitschr.* XXVI. p. 382. t. 7. f. 4. ♂ (1882); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 369. n. 50 (1896) (Angola); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 243. n. 66 (1899) (Angola).

♂. Allied to *Ch. neanthes*. Body above more or less white.—Wings above as in ♀ *Ch. neanthes betanimena*, the basal area being white, with a greenish yellow tint; costal margin and disc of forewing, and a broad discal border of white area of hindwing ochreous; disco-marginal area tawny.—Forewing: median bars SC<sup>4</sup>—R<sup>2</sup> merged together with the disco-marginal band as in *betanimena*; bar D and median bar R<sup>3</sup>—M<sup>1</sup> present, but not cell-bar 4; postdiscal ochraceous interstitial spots SC<sup>5</sup>—SM<sup>2</sup> all marked.—Hindwing: discal bars black, the same in position as in *Ch. neanthes neanthes*, but posterior bar a little more proximal (according to figure); submarginal spots C—R<sup>2</sup> obsolete.

Underside as in *neanthes neanthes*, median band vestigial on forewing, scarcely traceable on hindwing (individual character only?); hindwing more strongly angled at R<sup>3</sup>; tooth broad and truncate; tail M<sup>2</sup> as in *neanthes*.

♀. Unknown.

Length of forewing: ♂, 30 mm.

*Hab.* Pungo Andongo, Angola, May 25 (Berlin Museum).

*t*<sup>4</sup>. Basal area of both wings ochraceous or ochreous above in ♂ and ♀, or white in ♀.

## 93. *Charaxes neanthes*.

*Nymphalis neanthes* Hewitson, *Exot. Butt. I. Nymphalis* t. 1. f. 2. 3. ♀ (1854) (Natal).

♂ ♀. Body above tawny olive, thorax with a greyish tint, abdomen more tawny ochraceous, in ♀ sometimes whitish, palpi brown; four dots on head and a thin line behind eye cream colour. Underside tawny or tawny ochraceous, middle of sterna, legs, and in ♀ also abdomen more or less white.

♂. Wings above ochraceous, sometimes almost ochreous.—Forewing: outer margin deeply excavated between SC<sup>5</sup> and M<sup>2</sup>, angled at SC<sup>5</sup>; a postdisco-marginal band of about even width, varying in tint from seal brown to tawny ochraceous; preceded by a series of discal patches of the same colour, the series about 6 mm. from margin behind R<sup>3</sup>, almost parallel to it, the spots seldom reduced to blackish dots situated in pale tawny clouds, generally merged together to a band which is, moreover, joined along the veins to the postdisco-marginal band, thus isolating a series of rather small postdiscal interstitial spots of the ground-colour; median bars SC<sup>4,5</sup>—R<sup>2</sup> triangular, their outer edge about 5 mm. from cell, often merged together to one patch which is joined to the disco-marginal area at costal margin and at R<sup>2</sup>, sometimes also at R<sup>1</sup>; in the latter case, the postdiscal interstitial ochraceous spots are reduced in size and number, spots R<sup>1</sup>—R<sup>2</sup> and M<sup>1</sup>—SM<sup>2</sup> being absent or only vestigial; no median bar R<sup>2</sup>—R<sup>3</sup>, but bars R<sup>3</sup>—M<sup>2</sup> sometimes vestigial; bar D present; cell-bar 4 often marked, parallel to bar D, about 1½ or 2 mm. distant from it, with the interspace more or less scaled tawny or brown; cell-bar 3 seldom marked as a dot.—Hindwing: a discal series of

blackish brown, halfmoon-shaped, bars, the series somewhat biconcave, bar  $SC^2-R^1$  6 to 7 mm. from outer margin, being the most proximal; postdiscal bars broader, but less well-defined, tawny, bar  $C-SC^2$  absent or merged together with the discal one, the next two transverse, the following ones more halfmoon-shaped, often very faint, joined at the veins to the submarginal bars; the latter deeper in tint, often blackish upon the internervular folds, especially last three or four, posterior ones mostly with minute, but obvious, white dots at proximal side; upper post-discal, submarginal, and admarginal interspaces sometimes obsolete, the brown scaling then forming a disco-marginal band; anal admarginal interspace greyish olive buff; basal half or two-thirds of abdominal fold creamy buff, cellule  $C-SC^2$  often the same colour from base to discal bar; median bars sometimes faintly vestigial.

*Underside* varying from ochreous to chestnut tawny, sparsely or more densely shaded with black speckles; veins greenish.—Forewing: costal margin generally white at or near base, this character individually variable; cell-bar 3 indicated by two dots in many specimens, cell-bar 4 often vestigial, not rarely with white proximal border, forming together with bar D and the submedian and median bars  $M^1-(SM^1)$  a band of 2 mm. width filled up with blackish scales, this band often scarcely traceable; median bar  $SC^4-R^1$  about 4 mm. from cell, mostly absent, with a space at outside which bears fewer black speckles; discal bars represented by tiny black dots, the middle ones of which are often absent, the dots sometimes with white outer borders; some glossy grey scaling in marginal area, especially at apex.—Hindwing: a white dot before base of C, another at base of abdominal margin; no basal and subbasal bars; submedian and median bars forming a band as on forewing, the band bordered white proximally, slightly concave distally, crossing  $M^2$  2 mm. from its base, then turning distad, sharply hooked at  $(SM^1)$ , portion  $(SM^1)-SM^3$  standing at an acute angle to the main part of the band, the band often more or less obsolete, especially the proximal (submedian) part, sometimes reduced to some vestigials in the middle of wing; bar D in the band; discal bars represented by tiny spots, posterior ones arched, with thin white distal borders; postdiscal bars seldom vestigial; submarginal bars small, upper ones often obsolete, or mere dots, posterior ones transverse, with white dots at proximal side, sometimes obsolete; wing rather glossy, a large discal patch between  $R^2$  and  $M^2$  without gloss; outer margin rounded in front, concave between  $R^3$  and  $M^2$ , angled or toothed at  $R^3$ , produced into a spatulate tail at  $M^2$ ; anal angle very obtuse.

♀. *Wings above* paler than in most ♂♂, basal area whitish in Madagascar race, discal bars resp. patches of both wings more proximal than in ♂, more deeply concave.—Forewing: outer margin sharply angled at  $SC^5$ ; median bars  $SC^{4.5}-R^2$  smaller than in ♂, occasionally absent; discal bars often all isolated, sometimes reduced to dots, posterior ones not always marked, upper three often joined at veins to the postdisco-marginal band, which is anteriorly obviously broader than posteriorly.—Hindwing: discal bar  $SC^2-R^1$  7 to 9 mm. from outer margin, the discal bars brownish black, often thin and separated.

*Underside* as in ♂, but paler; two spatulate tails, the first somewhat curved costad, the second rather longer, curved abdominad; postdiscal bars of forewing mostly vestigial.

Length of wing: ♂, 25–30 mm.

„ „ ♀, 30–34 mm.



Tenth tergite ( $\delta$ ) rounded, often sinuate; penis-funnel triangular, dorsal cavity not quite extended to the end, which is hooked; penis thin, with a minute tooth before the end; clasper narrowed at apex into a slender tooth which is gently curved mesiad.

*Hab.* East Africa from Natal to Abyssinia; Madagascar.

Individually very variable on upper- and underside; angle of forewing often rounded, sometimes very prominent and acute.

#### a. *Ch. neanthes neanthes*.

*Nymphalis neanthes* Hewitson, *Exot. Butt. I. Nymphalis* t. 1. f. 2. 3. ♀ (1854) (Natal); Trim., *Rhop. Afr. Austr.* p. 179. n. 104 (1862) (Natal); Kirby, *Cat. Diurn. Lep.* p. 273. n. 55 (1871); Gooch, *Entom.* XIV. p. 6 (1881) (Natal); Oberth., *Ann. Mus. Civ. Genova* XVIII. p. 728. n. 61 (1883) (Shoa; Jan., June, July, Nov.).

*Charaxes neanthes*, Butler, *Proc. Zool. Soc. Lond.* p. 638. n. 63 (1865) (Natal); Staud., *Exot. Tagf.* p. 171. t. 58 (1886) (Natal; Del. Bay); Trim. & Bowk., *S. Afr. Butt. I.* p. 320. n. 104 (1887) (Caffraria; Natal; Delagoa B.); Rogenh., in Baumann, *Usambara* p. 327. n. 86 (1891) (Usagara); Butl., *Proc. Zool. Soc. Lond.* p. 650. n. 25 (1893) (L. Mero); Reb. & Rogenh., in Baumann, *Massailand* p. 332. n. 98 (1894) (Serengeti); Holl., *Proc. U. St. Nat. Mus.* XVII. p. 262 (1895) (Brit. E. A.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 369. n. 49 (1896) (Caffraria; Natal; Del. Bay; L. Mero; "Cameroons" loc. err.!!); Sharpe, *Proc. Zool. Soc. Lond.* p. 533. n. 36 (1896) (Somaliland; Sheik Husein, IX); Butl., *ibid.* p. 397. n. 8 (1898) (Brit. E. Afr., March); Auriv., *Kongl. Sv. Vet. Ak. Handl.* XXXI. 5. p. 244. n. 68 (1899).

♂. *Wings above* ochraceous.—Forewing: bars and postdisco-marginal band varying individually from seal brown to tawny; in the darkest specimens median bars  $SC^{4.5}$ — $R^2$  joined together and to disco-marginal area, the discal bars larger, fused to a band which is partly separated from the postdisco-marginal band by rather small ochraceous interstitial spots, of which spot  $R^1$ — $R^2$  and  $M^1$ — $SM^2$  are sometimes absent, brown median band at end of cell prolonged to  $M^1$ ; in the palest specimens the median patches  $SC^{4.5}$ — $R^2$  are isolated and the discal bars are also partly, the posterior ones totally, isolated.—Hindwing: postdiscal ochraceous interstitial spots  $SC^2$ — $M^1$  well marked, upper submarginal interstitial dots also obvious, though small.

*Underside* ochraceous or tawny ochraceous, the black speckles rather prominent on the pale ground; the median band well marked, or vestigial, with all intergradations, the presence of the band apparently independent of the depth of the tone of the postdisco-marginal band of the *upperside*.—Hindwing: tooth at  $R^3$  very short.

♀. *Wings above* ochraceous; discal bars luniform, thin, posterior ones of forewing separated, postdiscal ochraceous interspaces  $R^3$ — $M^2$  of forewing wider than the postdisco-marginal band.—Hindwing: discal series considerably varying in size, sometimes very slightly concave in front, bar  $SC^2$ — $R^1$  very little more proximal than bar C— $SC^2$  in some specimens.

*Underside* pale ochraceous, the median band mostly well marked, sometimes vestigial.

*Hab.* East Africa, from Natal to Abyssinia.

In the Tring Museum 28 ♂♂, 21 ♀♀ from: Natal: Estcourt, v. vi. Delagoa Bay; Zomba, xii. '95 (Dr. P. Rendall); Rikatla. German E. Afr.: Mikindani, i. to v. British E. Afr.: Mombasa; Taveta, vi. vii.; Kibwezi, 5. ii. '95 (Dr. Ansonge); Ndange, 1. iv. '95 (Ansonge); Mbinzan, 8. iv. '94 (Ansonge); Melindi. Somaliland: Sheik Husein, 30. ix. '94, wet country, 5 to 7000 ft. (Dr. Donaldson Smith). Abyssinia: Shoa, Shoatalit, 9. i. '80 (Antinori).

*b. Ch. neanthes betanimena.*

*Charaxes betanimena* Lucas, *Ann. Sc. Nat.* (5). XV. n. 22. p. 3 (1872) (Madag.); Mab., in Grandid., *Hist. Madag.*, Lép. I. p. 198. n. 11. t. 23. f. 5. 6. ♂ (1885-87) (Madag. or.); Butl., *Journ. Linn. Soc. Lond.* XXV. p. 369. n. 48 (1896) (Ft. Dauphin); Auriv., *Kongl. Sr. Vet. Ak. Handl.* XXXI. 5. p. 242. n. 67 (1899) (Madag.).

*Charaxes andriba* Ward, *Ent. Mo. Mag.* IX. p. 216 (1873) (Madag.).

*Charaxes freyi* Branczik, *Jahresh. Ver. Trencs. Comit.* p. 161. t. 7. f. 8. ♀ (1891) (Nossibé).

*Charaxes betanimena ab. andriba*, Aurivillius, l.c.

♂. Thorax *above* more olive than in the continental form.—Wings *above* ochraceous ochreous with a gallstone yellow tint, veins pale green (if denuded).—Forewing: median bars SC<sup>4</sup>—R<sup>2</sup> and discal bars completely merged together with the postdisco-marginal band as in the darkest specimens of *n. neanthes*; colour of this outer area varying from seal brown to tawny chestnut; bar D present, but cell-bar 4 often absent in dark as well as in pale specimens, bars R<sup>3</sup>—M<sup>2</sup> seldom vestigial; number of postdiscal interstitial spots variable; angle at SC<sup>5</sup> acute or obtuse, sometimes rounded.—Hindwing: postdiscal and submarginal interspaces C—R<sup>3</sup> more or less shaded over with seal brown or tawny, hence the spots less distinct, obliterated in the dark specimen.

*Underside* chestnut tawny, band very conspicuous or vestigial, with intergradations; median bars SC<sup>5</sup>—R<sup>2</sup> often vestigial, with white proximal border; tooth R<sup>3</sup> of hindwing mostly longer than in *n. neanthes*, anal area more produced between M<sup>2</sup> and SM<sup>2</sup>, hence wing more triangular; tail longer.

♀. *Body above* paler than in ♂, posterior part of mesonotum, the metanotum and abdomen white. *Wings above*, basal area white; discal bars of both wings heavy, continuous; submarginal interstitial spots of hindwing obsolete.

*Underside* nearly as in *n. neanthes*, discal dots of forewing and postdiscal vestigial bars more obvious.

*Hab.* Madagascar. In the Tring Museum 7 ♂♂, 1 ♀.

## SOME MISCELLANEOUS NOTES ON PALAEARCTIC BIRDS.

By ERNST HARTERT.

WHEN, in 1897, I wrote for this journal some "Notes on Palaearctic Birds and Allied Forms" (cf. Nov. Zool. IV. pp. 131—147), I hoped soon to be able to continue my investigations on palaearctic birds. More urgent work, however, has prevented me to work as much in that line as I should have liked; but, nevertheless, I have had some opportunities to collect and to study European birds, and I will here give a few short notes with a view to future more lengthy articles, either by myself alone or together with a brother ornithologist.

### I. *Certhia*.

I see no reason to deviate from my conclusions about the Tree Creepers, except in a few points. When writing in 1897 I treated *C. brachydactyla* as a subspecies of *C. familiaris*. I have now had opportunities to observe both these forms frequently in Germany, especially near Marburg and Berlepsch Castle, in Hesse, and I have studied a large material. I find that both forms live close together and yet keep separate, although it is quite possible that they mix occasionally and produce hybrids (Deichler, *Journ. f. Orn.* 1896, p. 450). They have also different notes, that of *C. familiaris* being longer and not so loud, that of *C. brachydactyla* shorter and louder. Also the eggs of *C. familiaris* have in Germany, as a rule, much smaller spots than those of *C. brachydactyla*, which have larger and often confluent patches, though exceptions may not be rare (Deichler, *l.c.*).

Under these circumstances—the differences in colour, size of bill and hind-claw being constant enough—I think it is necessary to treat *C. familiaris* and *C. brachydactyla* as two distinct species. With regard to the British Tree Creeper, I find that it is not nearest allied to *C. brachydactyla*, but clearly a subspecies of *C. familiaris*. The length of the bill and hind-claw and the note are those of *C. familiaris* and not those of *C. brachydactyla*. In fact, it differs from *C. familiaris familiaris* merely in colour, being altogether much more rufous above, the pale marks being narrower and rufous-buff instead of buffy white, the rump darker and brighter rufous. It must, however, be said that eastern and northern continental examples are much more whitish than western and southern ones which are browner and darker. Some French examples cannot easily be distinguished from British ones, while those from Scandinavia and Eastern Prussia, for example, differ tremendously. The exact distribution of *C. brachydactyla* is not yet understood. It is principally a western bird, and yet, as far as I know, quite absent from the British Islands. It will probably not be difficult to distinguish several more subspecies of *C. familiaris* and perhaps also of *C. brachydactyla* in Europe, but we require more material to do so with some satisfaction. Specimens from Spain and Asia Minor are very remarkable, but our material is too scanty. (Cf. *Kleinschm. Orn. Monber.* 1900, p. 169, which appeared while this article was in press).

## II. *Sitta europaea britannica* subsp. nov.

When Mr. Kleinschmidt was in England three years ago we shot a few Nuthatches, and it struck us at once that they were paler below than German examples. Since then, I have collected Nuthatches for Mr. Rothschild's Museum, and I have now before me a very fine series from various countries, besides those in the Brehm collection. Glancing over them as they lie in the trays, it is quite obvious that the British examples are very much paler on the undersurface. This is most obvious in freshly moulted autumn specimens. When studying these birds, individuals of the same seasons and sexes must of course be compared, dirty spring birds being of course not so distinct, and the males being larger and of a brighter colour below than the females. In British individuals the beak is generally, though not always, slightly slenderer and more pointed.

The paler undersurface of the British form is the more remarkable as German Nuthatches are darkest in the west, and as other British birds, if different from the continental forms, are generally darker than their allies.

The type of *Sitta europaea britannica* is a bird shot in Tring Park on October 13th, 1898.

Prof. Reichenow (*Orn. Monatsber.* 1895, p. 141) has expressed his opinion that the name of *Sitta advena* Brehm is to be adopted for the East Prussian form of the Nuthatch, which has been called *Sitta caesia homeyeri* (cf. *Ibis*, 1892, p. 364). This is an error. Brehm (*Handb. Naturg. Vög. Deutschl.* p. 207, 1831), says that *advena* appears sometimes in the forests of Central Germany. The types of his *S. advena* are pale, worn and young individuals in moult from Thuringia. *Sitta caesia homeyeri*, however, does not appear in Central Germany, and looks different. The majority of the East Prussian Nuthatches are very closely allied to *Sitta europaea* from Scandinavia, but most individuals are less white, and more buff below, though some are not distinguishable from the latter, while also true *S. caesia*, or at least individuals which I cannot separate from the latter, are occasionally found in East Prussia. The birds in the plumage of the so-called *S. c. homeyeri* are too frequent to be regarded as hybrids. It is, however, evident that *europaea*, *homeyeri* and *caesia* are merely geographical representatives of one group, and therefore the nomenclature must be as follows:—

*Sitta europaea europaea*: Scandinavia, Northern Russia. (Exact geographical limits not yet quite clear to me.)

*Sitta europaea homeyeri*: East Prussia, Poland, etc. (In Denmark similar forms are said to occur!?)

*Sitta europaea caesia*: Western, Central and Southern Europe generally. (Southern examples require attention, as do those from Asia Minor.)

*Sitta europaea britannica*: Common in England, rarer in Scotland, unknown in Ireland.

## III. *Nucifraga* (cf. Nov. Zool. 1897).

I find that I cannot separate any longer Professor Reichenow's *N. relictæ*. Individuals in freshly moulted plumage of *N. car. caryocatactes* and *N. car. relictæ* are not separable. I have written at length about these forms in the "new edition" of Naumann's "Vögel Deutschlands," where those who are interested in the various forms of this group can read my most recent views about it.



IV. *Dendrocopus major* and its forms.

A study of the Great Spotted Woodpecker with regard to its distribution and local forms is perhaps still more interesting than that of the Creepers and Titmice, which have received so much attention lately. When attempting to become acquainted with the variation of *Dendrocopus major*, I find this task by no means easy. While this woodpecker seemed to be rather constant in less extended, especially in insular localities, it seemed to vary very much in other countries, for example in Germany. The over-zealous C. L. Brehm separated, as long ago as 1831, four forms inhabiting Germany :—

1. *Picus pinetorum*, with a strong and mediocral bill, inhabiting pine-forests ;
2. *Picus pityopicus*, with a short, strong and stumpy beak, inhabiting fir-woods ;
3. *Picus frondium*, with a larger skull and brighter and lighter colours, inhabiting the woods of leaved trees ;
4. *Picus montanus*, of larger size, with slenderer, more elongated bill, inhabiting the "foot of the South German mountains," being found near Gastein, in Salzburg, and Tirol.



In 1855, in the "Vogelfang," Brehm separated two species :—

1. *Picus major*, with three subspecies :
  - a. *P. m. montanus*, larger with longer bill ;
  - b. *P. m. pinetorum*, smaller with shorter bill ;
  - c. *P. m. pityopicus*, with short bill.
2. *Picus frondium*, with two subspecies :
  - a. *P. f. lucorum*, with longer bill and whitish grey underside ;
  - b. *P. f. sordidus*, with brownish grey underside.

The former (the 3 subspecies of *P. major*) are said to inhabit pine- and fir-woods, the latter (the two subspecies of *P. frondium*) the forests of leaved trees. Tangible differences between *P. major* and *frondium* are not given in the "Vogelfang."

I have now compared the large series from Germany in the Brehm collection with typical Scandinavian *Dendrocopus major*, and the various forms of Brehm with each other. I found that his "*pityopicus*" really had a shorter, stronger and more stumpy beak, and could hardly be separated from the northern bird, while the majority of the others, especially the "*pinetorum*," were smaller and had less powerful, though longer and more pointed bills. The questions now arise whether there are within Central Europe several geographically limited subspecies in a modern sense, or whether the nature of the trees in which the woodpeckers work has anything to do with the form and size of their bills, as has been suggested.

The material at my disposal is not sufficient to answer these questions satisfactorily ; but it is evident that examples from the western parts of the continent are smaller and have slenderer bills than those from the northern and eastern parts. This might be either a geographically limited character, or due to the greater prevalence of leaved trees in the western countries. But, though I cannot at present separate any subspecies on the European continent, I believe that the following review of the subspecies of *Dendrocopus major* is correct :—

### 1. *Dendrocopus major major* (L.).

Typical locality Scandinavia, extending to Russia and Prussia. Large form, wings in Sweden 143—145 mm., in East Prussia 138—142 mm. Bill very thick, blunt and comparatively short, forehead buff, underside white, slightly tinged with buff in freshly moulted plumage, and frequently stained.

There are in Western and Southern Europe smaller forms with slenderer and longer bills. Males from Ingelheim, on the Rhine, have the wings 136—141 mm., males from Renthendorf about 137—143 mm., two males from Bosnia 138 and 139 mm., ♀ Hesse 136 mm., ♀ Herzegovina 136 mm., ♀ France 136 mm., females Ingelheim 133, 139, 140 mm., ♀ Belgium 142 mm. A Macedonian male has the underside beautifully white and a very short bill. In parts of Asia Minor examples occur which seem to be similar to the one from Macedonia, and which do certainly not belong to *D. syriacus*. None of these forms can at present be separated by me, the material at my disposal being too scanty.

### 2. *Dendrocopus major anglicus* subsp. nov.

The British Woodpecker differs very strikingly when compared with Scandinavian and East German examples. Its wing is considerably shorter, the whole bird smaller, the bill much slenderer, and the underside, as a rule, much more brownish buff. The wings of English males before me measure 128, 129, 131, 132 mm., those of females 128, 130, 131 mm.

The type is an adult male shot near Horsham, in Sussex, on January 2nd, 1895. England, but not known to breed in Scotland or Ireland.

### 3. *Dendrocopus major* subsp. ?

Corsica and Italy is inhabited by a Great Spotted Woodpecker which seems to me separable as a good subspecies. The wing is comparatively short, the bill very long and slender, the underside brownish, ♂ wing 140, 142 mm., ♀ wing 138 mm. This latter female, shot, skinned and sexed by the late John Whitehead, has some narrow red lines on the sides of the nape. It is to be seen if all Corsican females have this peculiarity. I believe that the Italian examples (from the Apennines) are like those from Corsica. I refrain from naming this form before I have studied a larger material from Corsica and Italy. A specimen from Sardinia in the British Museum is small and very dark below, approaching closely the Canarian form.

### 4. *Dendrocopus major canariensis* (Koenig).

This insular subspecies differs from *D. major major* in its very long and pointed bill and the narrower white bars to the outer rectrices, which appear thus much more black. The forehead is buff, the underside brownish, sometimes not darker

than in British examples, sometimes as brown as in *D. m. poelzami*. Some individuals from Southern Spain come very close to *canariensis*. I have also seen one from Southern Spain in the British Museum which has a red pectoral crescent, and is not easily distinguishable from *D. m. mauritanus*.

#### 5. *Dendrocopus major mauritanus* (C. L. Brehm).

The Moroccan Spotted Woodpecker belongs doubtless to the *major* group. It is distinguished by its small size, a red band connecting the black stripes on the sides, across the crop region and the somewhat more extended red on the abdomen. This woodpecker is only known from Northern Morocco (Tangiers).

The red crescentic chest-band is sometimes obsolete.

#### 6. *Dendrocopus major numidus* (Malh.).

Differs from *D. m. mauritanus* in having always a band of black patches across the chest, and a more developed red crescent, formed by the red tips of the black feathers ; feet and bill slightly stronger.

Inhabitant of the oak-forests of Algiers and North Tunis.

Altum (*Journ. f. Orn.* 1862, p. 382) recorded this form from Münsterland, Germany. Needless to say, this is an absurdity, caused by the old and often inevitable evils of naming a bird from a diagnosis, instead of after a careful comparison, and of neglecting the geographical distribution! Specimens of the common German Great Spotted Woodpecker, with a more or less developed red chest-crescent, are by no means rare, and there are several in the Brehm collection ; but such birds cannot be called "*numidus*."

#### 7. *Dendrocopus major poelzami* (Bogd.).

Differs from *D. major major* in its smaller size, lesser white patch on the upper wing-coverts, and the colour of the underside, which is even darker than in *D. m. canariensis*, and of a chocolate brown. The forehead is light buff, the bill long, wing of females 120—122 mm.

This form is an inhabitant of the southern slopes of the Caucasus and of the district immediately south of the Caspian Sea.

#### 8. *Dendrocopus major leucopterus* (Salvad.).

Forehead white, underside nearly pure white. The white wing-patch is much extended, the white bars on the wings are wider and often confluent along the inner webs. The bill is very fine. This form seems to be variable to a certain extent, unless it can be split up again into several subspecies. The females do certainly not show the characteristic peculiarities so well as the males, and are very similar to *D. major*.

This form is an inhabitant of Turkestan and Western Mongolia.

#### 9. *Dendrocopus major cissa* (Pall.).

A fine large form, with white forehead and quite white undersurface. It is generally said that the outer rectrices of this form have a greater amount of white, but this is *not* generally the case. This form is **hardly distinguishable from true**

**major**, and reaches from Siberia eastwards to Russia. It seems as if it gets smaller again in Eastern Siberia, on the Amur, and there makes a slight effort to approach *D. m. japonicus*.

#### 10. *Dendrocopus major kamtschaticus* (Dyb.).

Forehead pale buff, underside of the purest white, lateral rectrices pure white or with a few tiny black spots towards the tip. Bill rather elongated.

Kamtschatka.

This bird has first been named *Picus major kamtschaticus* by Dybowski in *Bull. Soc. Zool. France*, 1883, p. 368. The quotation in the *Cat. B. Brit. Mus.* XVIII. p. 214 is wrong, and Taczanowski (*Fauna Orn. Sib. Orient.* II. p. 717) quotes "*kamtschatkensis*" instead of *kamtschaticus*. Stejneger afterwards named the bird *Dendrocopus purus*. *D. m. cissa* and *kamtschaticus* are erroneously lumped in the Catalogue of Birds.

#### 11. *Dendrocopus major japonicus* (Seeböhm).

Differs from *D. major major* in having the frontal band and undersurface more brownish buff, and in having the white bars on the wings regularly continued across the innermost secondaries. The dimensions are less. The young are striped on the sides of the chest, and cross-barred on the lower abdomen, but this peculiarity is also sometimes observed, though in a lesser degree, in European examples of *major*.

Japan and Kurile Islands.

#### 12. *Dendrocopus major syriacus* (Hempr. & Ehrb.).

In this form the black line behind the ear-coverts is absent. It is a small form, and the lateral rectrices are black with only a white tip and one additional white bar. The immature bird has blackish striations to the flanks and sides of the chest and a red crescent across the chest!

Although separated in the *Cat. B. Brit. Mus.* from *D. major* and its allies by such widely different species as *D. catapharius*, *pyrrhothorax* and *pernyi*, I believe that *syriacus* also belongs to the *major* group, representing it in parts of Asia Minor, Palestine and Western Persia, although another form of *D. major*, perhaps separable, perhaps not from *D. major major* or its Central and South-eastern European forms, occurs also in parts of Asia Minor. Anyhow, these forms require more attention and study.

#### 13. *Dendrocopus major scindeanus* (Horsf. & Moore).

If *syriacus* is admitted, I think the small *scindeanus* must also be put in the same group.

I believe that further also

#### *Dendrocopus cabanisi* (Malh.)

from China, and

#### *Dendrocopus himalayensis* (Jard.)

from Cashmere, etc., can be regarded as forms of *D. major*, and that with these the subspecies of this widely spread old-world group are finished, as far as they are at present known.



To recapitulate, we can, I think, recognise :—

- a. *Dendrocopus major major* : Northern Europe.
- b. An ill defined and not well geographically limited form, or perhaps several forms in Central and Western Europe.
- c. *Dendrocopus major anglicus* : Great Britain. Not known to breed in Ireland.
- d. Small forms in Italy, Corsica and (? the same) Sardinia, which require attention. They might or might not be separable.
- e. *D. m. canariensis* : Canary Islands.
- f. *D. m. mauritanus* : Morocco.
- g. *D. m. numidus* : Algiers and Tunis.
- h. *D. m. poelzani* : Southern slopes of Caucasus and country immediately south of the Caspian Sea.
- i. *D. m. leucopterus* : Turkestan and Western Mongolia.
- j. *D. m. cissa* : Siberia to Russia.
- k. *D. m. kamtschaticus* : Kamtschatka.
- l. *D. m. japonicus* : Japan and (?) Kurile Islands.
- m. *D. m. syriacus* : Asia Minor, Palestine, Western Persia.
- n. *D. m. scindeanus* : Sindh to the Punjab and Afghanistan ; and perhaps also *D. cabanisi* and *D. himalayensis* might be placed in this group.

#### V. *Strix flammea*.

It is surprising to find that since Dr. Sharpe's work on the Barn Owls (*Cat. B. Brit. Mus.* vol. II. pp. 291—303) so little attention has been paid to this most fascinating group. Probably from being attracted both by the great beauty of these magnificently coloured birds and by their striking geographical variation I have always been specially interested in the Barn Owls. The fine series already in the Tring Museum, including those of the Brehm collection, gave me some opportunity to study them, and I have already described new subspecies from Curaçao, Ecuador and Sumba. One fact has always struck me, that is the constant difference of the English form from that of Germany. Every German ornithologist wonders why Dresser figures (in his "Birds of Europe," vol. V.) such an "abnormally coloured" bird with white underside ; and recently my friends in the Fatherland were indignant that I gave Mr. Keulemans a similar bird with light underside to be figured in the new edition of Naumann's "Vögel Deutschlands." This alone is a clear proof that the English bird differs from the German form—for the birds figured in Dresser's work and in the new edition of Naumann are not at all abnormal, but the typical English ones. Such birds do not occur in Germany, and even the lightest rather rare varieties from Germany do not equal the commonest British form, which is white without or with few spots below. Under these circumstances it becomes a necessity to give different subspecific names to the British and Central European forms.

However, to apply the proper names is not easy. There are some excellent works on *Strix*, one by C. L. Brehm in *Naumannia* (1858), one by Ridgway in the "North American Birds," and above all those by Sharpe in *Cat. B. Brit. Mus.* II. and in the *Orn. Misc.* vol. I. Brehm's article is one of the best he ever wrote, though he shot far over the mark, as usual, considering individual variations as of specific or subspecific value, and not giving enough consideration and importance to the

geographical distribution. Sharpe was quite correct in considering that the various forms of Barn Owls had not full specific value in the old sense, but he was inconsistent in not allowing them subspecific rank, while recognising the various forms of *Bubo bubo*, *Scops magicus*, and *giu*, of *Surnia*, *Ninox*, *Syrnium* and others. Nevertheless, his work is the most valuable of all and teaches very much, though one thing was, in my opinion, a mistake: *i.e.* that *Strix rosenbergi* was placed among the synonyms of *Strix flammea*. I am sure that *S. rosenbergi* differs much and belongs to another group of forms.

In the new "Hand-List" (1899) Dr. Sharpe elevated to specific rank all the forms of *Strix* he seemed to know, though not separating any of the European ones, which he united with those of the whole of Africa. Dr. Sharpe's material, of which he was justly proud in 1875, saying that it would be difficult to find a more comprehensive collection, was evidently inadequate, or the celebrated author could not have said that the "dark phase," as he terms it, is rarer in old-world birds, and that Indian individuals are darker than European ones, while in fact all Central Europe is inhabited by a dark form. At present even the rich material now in the Tring Museum is not sufficient, and my time too much occupied to discuss already the Barn Owls of the world. I will therefore only speak of those of parts of Europe and Northern Africa.

Linnaeus, in his tenth edition, did not know the Barn Owl. In the twelfth edition he created the name *Strix flammea*. This name, however, is not quite as clear as we might wish. The diagnosis is: "*Strix capite laevi,\* corpore luteo punctis albis, subtus albido punctis nigricantibus.*" In the "*Fauna Suecica*" he said: "*Strix capite laevi, corpore luteo.*" He evidently did not know the bird at all, but went merely by books. In the "*Fauna Suecica*" he merely quotes Rndbeck, who had said that the bird was rare near Upsala and "*Tota flammea.*" He then proceeds (in Ed. XII. *Syst. Nat.*) to quote first Frisch, who figured the German form with brown underside. Then Aldrovandus (pp. 536, 538). Of these two places p. 536 is to me doubtful. The description given there may mean almost any owl of a size similar to that of a pigeon, while on p. 538 our Barn Owl is doubtlessly represented. Then follow Willughby and Ray, who described the British "White or Barn Owl." Linnaeus says: "Habitat in Europa."

Thus Linnaeus' *Strix flammea* must be referred to the species which we call now *flammea*, but it cannot easily be restricted to a certain subspecies, comprising as it does the continental Central European as well as the white-bellied British form. There remain, therefore, two courses: either to restrict the name *flammea* arbitrarily to the North and Central European form, or to adopt for it as the third name the next available one. Of these the first in print is *Strix guttata* C. L. Brehm, 1831. This name refers to a light variety of the dark form with the underside white, or merging from pale rusty yellow into whitish, in contradiction to the usual form with dark rust-coloured underside, which the author calls *flammea*, and I think we had better stick to this latter name for the dark Central European form. Scandinavian and Danish birds are, as a rule, very dark below. In any case, Brehm's *Strix flammea obscura*, *vulgaris*, *adspersa* and *guttata* refer doubtless all to the same form in various aberrations. The typical examples of his collection are before me.

To my surprise I find that the birds from Southern Spain, Tangiers, Southern and Western France, the Channel Islands and Great Britain are all the same and

\* Meaning that it had no ears.

not in the least separable. As Brehm has named and described the form from Southern Spain as

***Strix flammea kirchhoffi*,**

this name must doubtless be used for the British Barn Owl.\*

The distribution of this form is not yet certain. I am inclined to think that it extends along the Mediterranean to Egypt. I have an individual from Sardinia before me in the Tring Museum which is extremely light above, but one from England can hardly be distinguished from it. Therefore more material must be compared to say whether the Sardinian, Corsican, etc., birds are separate from *kirchhoffi* or not. In Italy the usual form of the Barn Owl is white below with a pale rusty shade across the chest which is seldom absent, with few small spots on the sides of the body, which are often absent, but mostly present. Sometimes individuals occur with many spots below, like Egyptian individuals. In the Turati collection in Milan such examples are represented from Lombardy. Dark examples, like those from Germany, are extremely rare in Italy. They are probably foreign to Italy and do not breed there. I have seen one from Lombardy and one from Genoa. This latter individual has the face quite dark, and can hardly be distinguished from the very constant and well-marked *insularis* from the Cape Verd Islands! The spots in the centres of the feathers are black with white tips. The wing measures 275 mm.

Algerian and Tunisian Barn Owls are like our *kirchhoffi*, and perhaps not separable from it. A series from Algeria (Loche coll.), in Milan (coll. Turati), varies very much. Some are darker, some lighter above, but all are white below, though spotted and punctulated in a very different degree. It would be worth while to find out whether the coast-region, the mountains and towns on the borders of the Sahara all have the same form or not! The Algerian form has been well described and named *paradoxa* by C. L. Brehm, and it is by no means necessary to refer to his collection to recognise this name. *Strix flammea* var. *meridionalis* Koenig is clearly a synonym of *paradoxa*. Egyptian examples must—if separable—bear the name *splendens* of Brehm, but from the material seen I do not see how they can be separated from *kirchhoffi*; I have, however, not seen many. Probably they are more spotted with tiny black spots below, and the metatarsus is more bare. I believe, however, that this latter character is not true, as it might be due to the feathers of their legs being more worn. The same peculiarity is more or less seen in those from Tunis and Morocco.

South of Egypt proper, near Khartum, a very peculiar form occurs, a large long-legged one with pale but not pure white undersurface, with arrow-shaped spots, and with a strongly spotted beautiful uppersurface. This is *maculata* of Brehm.

Brehm's *margaritata* (ex Paul of Württemberg's MS.) is hardly clear. The type is a bird labelled "Egypt," exactly like *maculata*, but smaller. With this Brehm unites a bird from Saxony and one from Gera, in Reuss, of which he says that it is the one formerly described by him as *Strix guttata*!

A very interesting form inhabits Madeira and probably also the Canary Islands. It has the dark colouration above of *Strix flammea* from Central Europe, but the face is whitish with very dark spots round the eyes, combined with a very

\* This is not the only instance of Mediterranean forms reaching England via France. A similar case is that of the Dartford Warbler (*Melizophilus undatus*).

pale but not pure white and heavily spotted undersurface. It is appropriately named

***Strix flammea schmitzi* subsp. nov.**

Type in the Tring Museum from Funchal, collected by Padre Schmitz, who has done much to increase our knowledge of Madeiran ornithology, and to supply specimens to various European museums.

We are thus at present, in Europe and Northern Africa, acquainted with :

a. *Strix flammea flammea* : Southern Scandinavia, Central Europe to France and Switzerland, Austria, Hungary. (We have no Russian material.)

b. *Strix flammea kirchhoffi* : Tangiers to Great Britain and Ireland. Perhaps along the Mediterranean, through Italy to Egypt, but possibly the Italian and North African birds are again separable! A few times very dark birds have occurred in England, but they are clearly visitors from the continent. The distribution in France of this form is not clear! It seems that near Lyons and also near Paris the dark and the light forms are found. Intermediate forms might occur towards the west. I have not examined Irish individuals.

c. *Strix flammea maculata* : Khartum, Blue and White Nile. (Brehm collection; Witherby collection.)

d. *Strix flammea schmitzi* : Madeira (and ? Canaries).

e. *Strix flammea insularis* : Cape Verd Islands.

**VI. *Garrulus glandarius*.**

Mr. Rothschild has brought together a very large material of the Jay. This shows clearly that there is a tendency in Western Europe, and especially in the British Islands, to be darker above, while in the East there is generally a lighter colouration prevalent. These differences, however, are so slight and variable, and the gradation is so gradual, that it is not wise to apply a subspecific name to the darker form.

**VII. *Ceryle lugubris continentalis* subsp. nov.**

Hitherto the large black and white Kingfishers from the Himalayas and Assam and from Japan have been united under the name of *C. lugubris* or *C. guttata*. They are, however, distinguishable, the bird from India being generally darker than the one from Japan. The former has narrower, the latter wider white bars to the feathers of the upper surface. This is especially apparent on the wing-coverts. The wing of Japanese individuals is also generally about 1 cm. longer.

The name *Alcedo lugubris* has been given by Temminck to the Japanese bird. The Indian form requires therefore a new name, and I name it *Ceryle lugubris continentalis*. (Type in the Tring Museum from Sikkim, shot by Mr. H. J. Elwes on March 30th, 1876.) Gray called the Indian form *Alcyon guttata*, but this name is not more available, since Boddaert has already named the African Great Kingfisher (our present *Ceryle maxima*) *Alcedo guttata*.

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# BEMERKUNGEN ÜBER DIE NEUWELTLICHE GATTUNG *POLIOPTILA* NEBST BESCHREIBUNG EINER NEUEN SUBSPECIES AUS PERU.

VON C. E. HELLMAYR.

EINE schöne Serie von fast 70 *Poliophtilen*, die zu untersuchen mir durch die Liebenswürdigkeit der Herren von Rothschild, Hartert und Prof. Reichenow Gelegenheit geboten war, veranlasst mich zu einigen Bemerkungen, die hoffentlich nicht allen Interesses entbehren. Die Vertreter dieser auf das wärmere Amerika beschränkten Gattung kann man in zwei scharf gesonderte Gruppen zerlegen, deren eine sich durch schwarzen Oberkopf charakterisiert, während er bei der anderen kleineren Abteilung grau oder blaugrau wie der Rücken gefärbt ist.\*

Zur letztgenannten gehören ausser der cubanischen *P. lembeyi* Gundl. noch die nordamerikanische *P. caerulea*, *P. dumicola* aus Südamerika und *P. boliviana* aus Bolivia. *P. schistaceigula* Hart. repräsentiert den Typus einer dritten, aberanten Gruppe mit einfarbig dunkler, fast schwärzlicher Oberseite. Über die grauköpfigen Arten nur wenige Worte.

Bonaparte beschrieb (Consp. v. 1. p. 315) eine Art aus Mexico unter dem Namen *Culicivora mexicana*, die aber von den späteren Autoren entweder einfach als Synonym zu *P. caerulea* gezogen, von anderen als das Winterkleid dieser Art angesehen wurde. Nelson wies nun vor Kurzem (Auk 1898, p. 160) nach, dass die Bonaparte'sche Art eine gut unterscheidbare Subspecies von *P. caerulea* darstelle und gibt als Heimat den Küstenstrich von Vera Cruz (und Yucatan?) an; unter den Berliner Vögeln finde ich zwei Exemplare, eins von Oaxaca, das andere von Cocoyac, welche mit der Diagnose von Bonaparte völlig übereinstimmen, so dass ich die Ansicht Nelsons für ganz correct ansehen muss. Diese restituierte Form kennzeichnet sich sofort durch geringere Grösse und mehr grane Oberseite, ferner durch die Undeutlichkeit der schwarzen Partie auf der Stirn. Eines der untersuchten Exemplare trägt das Winterkleid und zeigt sehr wenig von der schwarzen Färbung auf der Stirn, wie es auch Nelson gefunden hat (mein Vogel ist allerdings ein ♀, doch zeigen die fünf mir vorliegenden ♀♀ der *P. caerulea caerulea* und *P. caer. obscura* stets eine weit deutlichere Ausbildung dieses Merkmals). Unsere Form scheint demnach über das südliche Mexico verbreitet zu sein, und stellt sich die Verbreitung der vier bekannten Unterarten von *P. caerulea* folgendermassen:

*P. caerulea caerulea* (L.): mittlere und südl. Provinzen der vereinigten Staaten.

*P. caerulea obscura* Ridgw.: Arizona, Californien, Untercalifornien und Westmexico.

*P. caerulea mexicana* (Bp.): Süd-mexico und (?) Yucatan.

*P. caerulea caesiogaster* Ridgw.: Bahamas-Inseln.

\* Bei meinen Untersuchungen wurden grösstenteils nur die ♂♂ in Betracht gezogen, weil die ♀♀ einiger Arten schwer oder gar nicht zu unterscheiden sind.

Mir lag ausser mehreren typischen *P. dumicola* noch ein Paar aus Cuyaba vor und möchte ich bloss bemerken, dass die letzteren sehr gut zu unterscheiden sind. Bezüglich genauerer Angaben der Unterschiede zwischen *P. dumicola* (Vieill.) und *P. boliviana* ScL. verweise ich auf die Ausführungen P. Leverkühns im J. f. Orn. 1889, p. 109. Wenn auch Zwischenformen vorkommen, die Extreme sind jedenfalls aneinanderzuhalten und daher wohl besser als Subspecies einer Art aufzufassen.

Über die schwarzköpfigen Arten erlaube ich mir, einige ausführlichere Notizen zu machen. Sharpe hat im Cat. B. Brit. Mus. v. 10 *P. albiloris* ScL. und *P. bilineata* (Bp.) als zwei gesonderte Arten behandelt, aber in einer späteren Arbeit im Ibis auf die Unbeständigkeit ihrer specifischen Charaktere hingewiesen. Ich habe eine Reihe von 15 Stück aus verschiedenen Gegenden unter den Händen gehabt, und mich überzeugt, dass man von einer Sonderung der beiden Formen absehen muss; das angegebene Unterscheidungsmerkmal, die Ausdehnung des Weiss auf den Kopfseiten, ist ausserordentlich variabel und auch die übrigen Kennzeichen sind nichts weniger als constant. Deshalb möchte ich die beiden Formen als eine einzige Art, *P. bilineata* (Bp.), zusammenfassen.

Abgesehen von *P. bilineata* und *lactea* Sharpe möchte ich drei südamerikanische Arten unterscheiden: *P. buffoni* ScL., *P. nigriceps* Baird und *P. leucogastra* Wied. Zwar sind auch sie von einander wenig verschieden, aber ihre Charaktere sind sehr constant, so dass man sie bei einiger Übung mit Sicherheit auseinanderzuhalten vermag. Die erstgenannte, auf Guyana beschränkte Art kennzeichnet sich durch die ausserordentlich breiten Säume auf den Armschwingen und die breiten, hellen, oft fast weissen Ränder an den grossen Flügeldecken, auch ist die Färbung der Oberseite heller bläulichgrau als bei den verwandten Arten. Mit diesen dürfte sie also schwerlich verwechselt werden können, schwieriger sind aber die Differenzen zwischen *P. leucogastra* und *P. nigriceps* anzugeben, zumal die letztere sehr variabel zu sein scheint, wie die folgenden Zeilen darthun sollen. Das von Sharpe angeführte Diagnosticon, dass bei der einen Art die schwarzen Partien der äussersten Schwanzfedern auf der Innenfahne eine "directly transverse line," bei der anderen aber eine "oblique" oder "crescent line" bilden, kann ich nicht als durchwegs zutreffend bezeichnen, eher möchte ich noch die weitere Ausdehnung der schwarzen Färbung der letzten Schwanzfeder, die bei *P. leucogastra* stets die Hälfte der Länge des Schwanzes erreicht, während sie bei *P. nigriceps* auf einen kleinen Fleck an der Basis beschränkt ist, und den Färbungston der Oberseite, der bei dieser (mit Ausnahme der columbianischen und peruanischen Form) mehr ins Bläuliche, bei jener mehr ins Graue spielt, zur Unterscheidung heranziehen. Die Vögel aus Bogotá und Peru können aber schon wegen ihres dunklen Rückens mit *P. leucogastra* nicht verwechselt werden, doch davon später. Ferner ist bei dem brasilianischen Vertreter die Brust stets reinweiss, bei allen *nigriceps*-Formen dagegen, wenn auch bisweilen bloss schwach, doch immer erkennbar bläulichgrau getrübt.

Die grösste Aufmerksamkeit verwendete ich auf *P. nigriceps*, von welcher mir ein ziemlich vollständiges Material aus dem Berliner und Tring Museum zu Gebote stand. 1885 unterschied Sharpe drei Formen, die er allerdings specifisch trennt, nämlich: *P. nigriceps*, *P. parvirostris* und *P. sclateri*, vereinigte aber die um Bogotá vorkommenden, von Taczanowski *P. buffoni* genannten Vögel mit erstgenannter Art. 1889 sonderte W. Brewster die Vögel aus Süd-Mexico als *P. nigriceps restricta* von der Hauptform. Ein ♂ des Tring Museums aus Costa Rica stimmt

in den meisten Punkten mit Brewsters Diagnose überein, insbesondere durch die geringe Ausdehnung der schwarzen Kopfplatte, welche sich nicht über den Nacken erstreckt, wie es bei den übrigen untersuchten Exemplaren der Fall ist. Auch ist der Anflug der Brustseiten dunkler, deshalb möchte ich den Vogel zu *restricta* ziehen, und hiebei die Bemerkung machen, dass mir diese Unterschiede mehr durch sein geringes Alter bedingt scheinen; unsere Form bedarf also noch der Nachuntersuchung; denn merkwürdigerweise zeigen die Stücke aus Venezuela wieder alle Charaktere der typischen Form, und die Verbreitung wäre auffallend; allerdings lagen mir mexikanische *nigriceps* nicht vor und halte ich es durchaus nicht für unwahrscheinlich, dass sich dieselben als von den Venezuela-Vögeln verschieden erweisen sollten. Während sich all die genannten Exemplare, sowohl das ♂ aus Costa Rica als die Belegstücke aus Venezuela, durch hellbläulichgrüne Rückenfärbung auszeichnen, wird dieselbe bei den Bewohnern der Umgebung von Bogotá und den Peruanern zusehends dunkler und zieht mehr ins Schiefergrau. Die erstgenannten Vögel zeigen, wie schon Taczanowski hervorhebt, das Schwarz auf den beiden äusseren Schwanzfedern mehr entwickelt; dasselbe reicht nämlich auf denselben fast bis zur Hälfte der Feder, während das dritte Paar nur mehr einen grossen, weissen Spitzenfleck besitzt. Ausserdem ist auch ihr Schnabel länger und die Säume der Armschwingen sind am besten bei dieser Form entwickelt, sie setzen sich nämlich in fast unverminderter Breite über die Spitze hinweg noch auf der Endhälfte der Innenfahne fort. Das Exemplar des Tring Museums ist in sehr abgetragenen Kleide und lässt diese Verhältnisse nicht sehr deutlich erkennen, welche hingegen bei den Berliner Vögeln auffallend zutage treten. Schliesslich haben alle drei Stücke in dem schwarzen Zügel knapp vor dem Auge einen weissen Fleck ähnlich wie *P. boliviana*; die Andeutung eines solchen findet sich ja allerdings auch bei typischen *nigriceps*, von welchen unsere Form aber durch die angeführten Unterschiede immer zu trennen ist. Mit *P. parvirostris* Sh. kann sie nicht identisch sein, weil diese sich durch kurzen Schnabel (11—12 mm.) auszeichnen soll (unsere drei Exemplare messen aber 13—14 mm., also am längsten von allen untersuchten), auch wird hier für die Rückenfärbung Hellbläulichgrau angegeben. Anders ist es aber mit *P. sclateri*, unter welchem Namen Sharpe die Bewohner von West(?)-Venezuela und der Sierra Nevada de Sta. Marta in N.-O. Columbien zusammengefasst hat, deren Charakteristikon in den grauen und oft so schmalen Säumen der Armschwingen bestehen soll, dass dieselben ganz einfarbig erscheinen. Alle Venezuela-Vögel, die ich untersuchte, weisen breite, weisse Säume auf, sind also von *sclateri* absolut verschieden; allerdings hatte ich aus der Gegend, wo *P. sclateri* vorkommt, kein Exemplar vor mir, aber eines in abgeriebenem Kleide aus Cumana zeigt die für letztere Art in Anspruch genommenen Charaktere. Ich möchte deshalb, freilich unter Vorbehalt, die Vermutung aussprechen, ob nicht Sharpe bei der Creierung seiner "Species" bloss Vögel in abgeriebenem Kleide vorgelegen haben; dann könnte sich allerdings die Bogotá-Form mit der von Venezuela als identisch erweisen. Da ich es mir zum Princip gemacht habe, alle Angaben, die ich nicht selbst prüfen kann, im Sinne der betr. Autoren zu erledigen, halte ich *P. sclateri* Sh., freilich nur als locale Unterart (mehr Berechtigung hat sie wohl keinesfalls) aufrecht und nenne, da *P. buffoni* von Sclater für die Guyana-Art verwendet wurde, die Bogotá-Vögel vorläufig *anteocularis*.

War schon die Rückenfärbung dieser Form etwas dunkler als bei den nördlicheren Exemplaren, so ist dies in noch höherem Grade bei den Peruanern der Fall, welche sich noch in mehreren anderen Punkten von den übrigen Vögeln

entfernen. Während bei all den bisher genannten Arten und Unterarten die an die schwarze Kopfplatte grenzenden Nackenfedern in weissliche Spitzen enden, wodurch eine Art Querband angedeutet wird, ist hiervon bei den Stücken aus Peru nichts zu bemerken, sondern der Rücken erscheint vom Hinterkopfe an einfarbig schiefergraublau. Ausserdem sind sie, wenn auch nicht bedeutend, so doch konstant grösser, wie die nachfolgende Masstabelle zeigen möge, und mache ich den Vorschlag, sie subspezifisch von der Hauptform zu sondern.

***P. nigriceps maior* subsp. n.**

Ähnlich *P. n. anteocularis*, aber grösser und dunkler. Oberkopf und Vorder Nacken schwarz, übrige Oberseite schieferblaugrau, auf den Schulterfedern mehr bläulich, die Federn an der Grenze der Kopfplatte niemals mit hellen Spitzen, also keine Spur von einem lichten Querbände. Kinn, Kehle und Unterkörper weiss, nur die Brustseiten blaugrau verwaschen.

L. t. ca. 120, a. 53, c. 55, t. 18, r. 12, 8 mm.

Typus: 19 Febr. 1896 Sueccha, 3000 m., Peru, coll. O. T. Baron (Rothschild Museum).

Masstabelle:

Bogotá. i. (Mus. Berol.) ♂: 49, 50, 17, 14; ii. (Mus. Berol.) ♀: 48, 48, 17, 13, 5; iii. (Tring. Mus.) ♂: 49, 50, 18, 14 mm.—***P. n. anteocularis* mihi.**

Peru. Typ. i. ♂: 53, 55, 18, 12, 8; ii. ♂: 52, 54, 19, 13, 5; iii. ♂: 53, 54, 18, 13 mm. (Tring Mus.).—***P. n. maior* mihi.**

Venezuela. i. ♂, Cumana: 50, 52, 16, 12; ii. ♂, Cumana: 50, 50, 16; iii. ♀, Cumana: 49, 49, 17, 11 mm.; iv. Maipures, ♂: 51, 51, 16, 8, 12; v. ♂, Altagracia (Orinoco); 50, 49, + x. (abgerieben), 17, 12, 5; vi. ♀, Altagracia: 50, 50, 16, 7, 12, 7 mm.; vii. ♂, Ciudad Bolivar: 50, 50, 16, 13 mm.; viii. ♀, Ciudad Bolivar: 50, 50, 16, 8, 12 mm.; ix. ♂, Snapure: 50, 48, 16, 5, 12 mm.—***P. n. nigriceps* Bd.**

Costa Rica, ♂: 49, 49, 16, 13 mm.—***P. n. restricta* Brewst.**

Wir können demnach folgende Formen unterscheiden:

*P. nigriceps nigriceps* Baird: Nordmexico, Venezuela.

*P. nigriceps restricta* Brewst.: Süd-mexico bis (?) Costa Rica.

*P. nigriceps sclateri* Sharpe: Sta. Marta (Colombia) und N.-W. Venezuela.

*P. nigriceps anteocularis* Hellm.: Columbien (Bogotá).

*P. nigriceps maior* Hellm.: Peru.

*P. nigriceps parvirostris* Sharpe: Oberer Amazonasstrom.

Ob *P. sclateri* eine besondere Form darstellt oder nicht, werden genaue Vergleiche derselben mit einer grösseren Reihe von Venezuela-Vögeln lehren; sehr erwünscht wäre auch eine genaue Untersuchung der Beziehungen zwischen den nordmexikanischen und den letztgenannten Exemplaren.

BERLIN, 20 September, 1900



NOTES ON *PULEX AVIUM* TASCHB.

BY THE HON. N. C. ROTHSCCHILD, B.A., F.L.S.

(Plate IX.)

DR. TASCHENBERG in *Die Flöhe*,\* p. 71, describes a flea under the name of *Pulex avium*, from various species of birds. As synonyms of his species are given no less than seven names of other authors for fleas found on birds. These are *Pulex gallinae*, *P. columbae*, *P. rufus*, *P. hirundinis*, *P. fringillae*, *C. bifasciatus*, *C. sturni* and *P. auritus*. Dr. Taschenberg states at the end of his article on *Pulex avium* that the examination of a large series of bird fleas has convinced him that all the fleas found on birds are identical and belong to the same species. On the ground, moreover, that the first name given to the species, that of *gallinae*, was unsuitable, it was rejected and an entirely new one, *avium*, was employed to designate the species.

The view that only one species of flea infests birds is still generally maintained. Mr. F. V. Theobald† however, in his work on British Flies, pp. 31 and 32, differentiates two species, *P. gallinae* and *P. hirundinis*, though the alleged specific differences between them are unsatisfactory. Mr. Theobald also mentions *Pulex fringillae*, and *P. columbae*, as being possibly distinct. No other attempt to differentiate fleas found on birds has, as far as we know, hitherto been published.

The older authors appear to have named and described each flea they got from a new host. The old descriptions are entirely insufficient, in fact they apply to almost every flea known. An attempt to unravel the synonymy of these insects, or to reconcile the older names with any particular species, is an impossibility. Few we think would doubt that Schrank's *Pulex gallinae* was the insect commonly found on the domestic fowl, but of absolute evidence to support this view there is none.

The bird fleas I have in my collection differ so much in size and colour that I felt sure they belonged to different species, and a careful examination convinces me that *Pulex avium* is a composite species. In the hope of inducing collectors to give some attention to bird fleas I have written down the following notes, basing my remarks on four common and easily distinguished *British* species. The principal distinctive characters are found in the last abdominal segments of both sexes. We believe that hitherto no attempt has been made to distinguish the *females* of closely allied species of fleas by this infallible test, which renders the identification of *females* of even two such closely allied insects as *Typhlopsylla agyrtes* and *T. orientalis* a matter of ease.

Bird fleas breed in the nests of their hosts, and are easily procured by putting a nest into a bag shortly after the young are fledged.

\* *Die Flöhe*. Von Dr. Otto Taschenberg. Halle, Max Niemeyer, 1880.

† *An Account of British Flies*. By Fred. V. Theobald Vol. I. London : Elliot Stock, 1892.

1. *Ceratophyllus gallinae* \* (Schränk), figs. 1. 2. 6. ♂ 10. 13. 17. 19. ♀.

*Pulex gallinae* Schränk, Fauna Boica III. p. 195 (1804).

Both sexes are very dark in colour. The head bears numerous hairs irregularly scattered over its surface. Those, *i.e.*, some half dozen, just anterior to the eye, are somewhat longer and stouter than the others. On the posterior edge of the head there are a few long thin hairs. The palpi in the *female* are as long as the rostrum. The number of teeth in the pronotal comb appears to vary; some specimens of both sexes having as many as thirty, while in others the number is reduced to twenty-six. The epimeron of the mesothorax is well developed, and, as in the genus *Ceratopsylla*, the suture between the fused epimeron and episternum is plainly visible.

The first five abdominal tergites in the *male* and the first four in the *female* bear at their posterior edges on each side short strongly chitinated spines. These spines vary in number, though there are apparently never more than four on each side. The fifth tergite in the *female* bears one or two spines. The first tergite in both sexes bears three rows of hairs, the anterior row consisting of short and the posterior of long hairs. In addition to these the tergite bears a few long hairs scattered irregularly over its dorsal surface. The next five tergites in both sexes bear two rows of hairs, the anterior row consisting of short bristles and the posterior row of long ones. There are also a few single hairs placed dorsally before the middle. The posterior edge of the seventh tergite in the *male* bears on each side one long and two very short bristles, the ratio between the lengths of these bristles being 100:12. In the *female* these hairs are also present, their relative lengths, however, are in the ratio of 100:45.

The sternite of the second segment is identical in both sexes, it bears some minute hairs laterally near its anterior edge, and two single thin hairs close to the middle line, one on each side. The third sternite has three hairs on each side. The fourth has three long, and one or two short hairs before them on each side in both sexes. The fifth is similar in both sexes, having three large and two or three small hairs on each side, the sixth in both sexes bears three long and three short bristles. The seventh sternite in the *male* bears two long and one shorter bristle, and also a few smaller hairs. The seventh sternite in the *female* is, as usual, enlarged. The mesial sinns is triangular in shape, the lobes being regularly rounded as shown in fig. 13. The number of hairs and their position on the segment varies a little. A comparison, however, of figs. 13 to 16 will show that the seventh sternites of all the four species herein treated of are abundantly distinct from each other. In figs. 17 and 18 the segment is represented *in situ* in side view.

The coxae and femora of the forelegs are sparsely covered with small hairs. The posterior edges of the coxae bear a single long hair. The ends of the femora bear a strongly chitinated bristle curving downwards. At the ends of the tibiae on the anterior edge are one long and one short strongly chitinated spines, and on the posterior edge there are ten similar spines. The femora of the middle legs have one long and one short chitinous spine curving downwards at their ends. The anterior edges of the tibiae bear one long, one shorter, and four short strongly chitinated spines at their ends. On the posterior edges there are twelve strongly chitinated spines.

\* *Ceratophyllus* cf. Wagner. *Aphanipterologische Studien III. Hor. Soc. Ent. Ross.* t. XXXI. p. 557 (1898).

On each side of the first four tarsi of the hindlegs in the *male* there are respectively five, five, three, and one strongly chitinised hairs, in the *female* there are six, four, three, and one.

Length: 3.06 to 3.40 mm.

As we have already pointed out, the chief distinctive specific characters of the bird fleas are to be found in the posterior abdominal segments of both sexes.

In the *male* the eighth abdominal tergite (fig. 6) bears on its outer surface a few long hairs, the position of which is shown in the figure. On the inner surface the apical area (between the stigma [*st* in figure] and the apical margin) is covered with numerous very short stiff hairs. That portion of the figure between the punctured line and the apical margin represents this area. The *male* copulatory organs are shown in fig. 1 (the penis being omitted). The eighth ventral segment is much modified, it consists of one rod-like piece dilated at the base and bearing here on each side a membrane covered with minute hairs, the outline of which I have not yet succeeded in determining. This membrane attaches the eighth sternite to the eighth tergite. The eighth sternite is produced at its apical end on each side into a thin, almost membranous, process pointing dorsad. The extremity of the segment bears some long hairs, generally six in number, seldom five.

The ninth tergite has the process (*p* in the figure) short, bearing two short hairs. The two long hairs placed ventrally to this process are also present in other bird fleas.

The "movable finger" (*f.* in figure) is widest at the end which is rounded, the arrangement of the few hairs it bears can be best seen in the figure. The ninth sternite is modified in the bird fleas in a peculiar manner. The two halves of the segment are fused ventrally and proximally, the distal free portions being apparently movable, and it is further covered with fine hairs. The ninth sternite is shown in fig. 2 as it appears when flattened out, the proximal end as here drawn is produced like a long wire-like spiral. The tenth segment consists of a mesially divided tergite and sternite, between which the rectum is generally visible. In a previous article of mine, Nov. Zool. vol. V., p. 538 (1898), I suggested that the movable finger, fig. 1 *f.* might be the tenth sternite; this is an error, the movable finger being a part of the ninth tergite.

In the *female* the eighth tergite (fig. 10) bears several irregular rows of short hairs dorsally above and near the stigma. The dilated portion of the tergite is sinuate distally; it bears two rows of three hairs, both of which are below the stigma, and a few hairs near the lower distal angle; of these latter hairs two or three are short and stout, having the appearance of spines.

The larger proximal portion of the brown abdominal gland, so conspicuous in the *female* of most fleas, is in the present species about twice as long as it is wide (fig. 19).

The present species is abundant on the Common Domestic Fowl all over Europe, but I do not know if it is found on the wild bird in India (*Gallus gallus*). I have also found it abundant in the nests of starlings (*Sturnus vulgaris*) and blackbirds (*Turdus merula*). In addition to these examples I have odd specimens undoubtedly belonging to this species from the Robin (*Erithacus rubecula*), the Long-tailed Tit (*Acredula rosea*), the Stock-dove (*Columba oeneas*), the Long-tailed Field-mouse (*Mus silvaticus*), and the Noctule Bat (*Scotophilus noctula*), these last taken near Brighton.

2. *Ceratophyllus columbae* (Walcken. & Gerv.),\* figs. 3. 9. ♂ 11. 14. 18. ♀.

*Pulex columbae* (Walcken. & Gerv.), *Hist. Nat. Ins., Aptères* III. p. 375 (1844).

Slightly smaller than *C. gallinae*, measuring 3 mm. in length. The palpi in the female are shorter than the rostrum. The prothoracic comb consists of twenty-eight teeth.

In the male the area of the eighth tergite bearing the short hairs is reduced to a narrow submarginal strip. The tergite externally (fig. 9) is similar to that of *gallinae*, but has fewer hairs on the margin. The eighth sternite bears at the end on each side three short stout bristles, but there is no distal membraneous process. The process *p* of the ninth tergite is club-shaped, and bears two very short and one long hair. The "movable finger" (fig. 3. f.) is slenderer than in *gallinae*, its ventral edge bearing five hairs, of which the first and fourth are the shortest. The distal portion of the ninth sternite is likewise slenderer than in *gallinae* and bears a fringe of hairs proximally.

In the female the sinns of the seventh sternite (fig. 14) is much deeper than in *gallinae*. The difference between the outlines of this sternite in *gallinae* and *columbae* is plainly visible, even when the segments are *in situ*, as in figs. 17 and 18. The hairs on the seventh sternite are similarly distributed to those in *gallinae*, but are fewer in number.

The eighth tergite (fig. 11) is more angulated below the stigma than in *gallinae*. The distal margin is not emarginate. There is a row of short hairs above the stigma with a few hairs a little further back. There are three hairs below the stigma and a few more, chiefly marginal or submarginal, placed ventro-apically, of these latter hairs five are short and very stout. The abdominal gland resembles that of *gallinae*.

This species is parasitic on *Columba livia*. I have specimens from the domestic variety, and am indebted to Mr. W. R. Ogilvie Grant for a nice set from the wild bird from the Stacks of Cromarty, in Scotland.

3. *Ceratophyllus hirundinis* Curtis † figs. 4. ♂ 12. 15. 20. ♀.

*Ceratophyllus hirundinis* Curtis, *Brit. Ent.* IX. 1832. No. 417.

A very pale species, measuring 2.3 mm. in length. The palpi in the female are shorter than the rostrum.

The eighth tergite in the male resembles that of *gallinae* especially with regard to the internal area covered with short bristles. There are more long hairs on the apical margin in the present species than in *gallinae*. The eighth sternite is wider apically in *C. hirundinis* than in the other three species, sub-truncate, and produced obliquely dorsad. It further bears a membraneous flap on each side, the flaps being fused together and surrounded by a large number of apical hairs.

The process *p* of the ninth tergite is shaped as in *columbae*, but is thinner. The "movable finger" (fig. 4. f.) is boot-shaped, the sole directed distad; it bears one stout and rather long hair at the toe and two similar hairs at the heel.

The ninth sternite (fig. 4. IX. v.) is similar to that of *gallinae*, but the apical portion is slenderer.

\* Stephen's name of *columbae*, *British Entomol.* IX. (1832) No. 417, must be rejected as a "nomen nudum."

† Possibly *Pulex hirundinis*, Köhler, *Uebersicht d. Arb. u. Veränd. d. Schles. Gesellsch. f. vaterl. Kultur*, p. 75, 1831, may refer to this species.



In the *female* the seventh sternite, fig. 15, has a different outline from that of the other three species, and bears more hairs arranged in different positions. The eighth tergite, fig. 12, is more densely covered with hairs than in the other three species. The hairs are arranged in two areas, the portion of the tergite between them being hairless. On the ventral area of the tergite some of the hairs are thicker, but they are not so spine-like as in the other species.

The abdominal gland (fig. 20), is slender, the proximal portion being three times as long as it is wide.

I have found this species parasitic only on the House Martin, *Chelidon urbica*.

#### 4. *Ceratophyllus styx*\* sp. nov. figs. 5. 7. 8. ♂ 16. ♀.

A much more hairy species than the others, and generally about the same size as *C. hirundinis*. Both sexes have the middle hair of the three dorsal apical hairs of the seventh tergite not twice the length of the other, as is the case in the three other species. (Cf. *ante*, p. 540).

In the *male* the eighth tergite, fig. 7, bears many hairs externally, these being especially dense on the apical margin. The area covered with bristles on the internal side is rather more extended than in *gallinae*, and is further bordered by a double series of spines (fig. 8).

The eighth sternite (fig. 5. VIII. v.) curves gradually ventrally towards the end, bearing numerous hairs. It terminates proximally in a double membranous lobe similar to that in *hirundinis*.

Process *p* of the ninth tergite is not club-shaped, it is shorter than this part in *columbae* and *hirundinis*, but is longer than in *gallinae*, and is oblique at the end.

The movable finger (fig. 5. f.) is somewhat similar in outline to that of *columbae*, but the hairs are arranged differently. There are four hairs in the centre of the anterior margin of about equal length, and three at the tip, of which the middle one is the longest.

The ninth sternite (fig. 5. IX. v.) has the distal portion longer and more slender than in the other species.

In the *female* the distal segments of the abdomen are much more hairy than in the other species, as are also the sternites of the other abdominal segment.

The seventh sternite (fig. 16) bears numerous hairs. The mesial sinus is triangular in shape, the lobes being sharply angulated.

The present species is parasitic on the Sand Martin (*Cotile riparia*).

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\* *Ceratophyllus bifasciatus* Curtis, *Brit. Entomol.* IX. (1832) No. 417, from the Sand Martin, is a "nomen nudum," and must consequently be rejected.

## DESCRIPTIONS OF NEW AFRICAN SPECIES OF *ACRAEINAE*

By H. GROSE-SMITH, B.A., F.E.S., F.Z.S., Etc.

### 1. *Acraea quirinalis* sp. nov.

♂. *Upperside*: anterior wings differ from *A. iturina* Gr.-Sm. in the absence of the cluster of dark scales in the cell, and the more extended rufous colouring of the basal half of the wings, which is paler than in *A. iturina*; on the posterior wings it differs from *A. iturina* in the basal rufous colouring being less extended, the discal row of spots is further from the cell and the spots are smaller, the large spot at the end of the cell between the two upper median nervules of *A. iturina* is absent, and there is an additional obscure spot in the cell.

*Underside*: does not differ from the *upperside*.

Expanse: 44 mm.

*Hab.* Usukama, south of Lake Victoria Nyanza.

In the collection of Mr. Grose-Smith.

It is smaller than *A. iturina*, and intermediate between that species and *A. quirina* Fabr.

### 2. *Acraea subserena* sp. nov.

♂. *Upperside*: both wings bright fulvous with black margins as in *A. terpsichore* Linn.: anterior wings with a rather large spot in the middle of the upperside of the cell, and another much larger quadrate spot at the end of the cell, partially elongated outwardly along the upper median nervule; the black outer marginal band is deeply indented on its inner side between the discoidal nervules: posterior wings with minute fulvous dots near the outer margin in the black area, and a narrow bar on the upper disco-cellular nervule, the five large spots on the underside showing through the wings as dark tawny.

*Underside*: anterior wings with the black outer marginal border strongly marked with light fulvous rays between the veins: posterior wings paler light fulvous, the outer marginal black border very bright and well defined, with small fulvous markings on the margin, inside which, between the median nervules, are four minute fulvous lines arranged in pairs, one spot towards the base of the cell, one on the discocellular nervule, one above the subcostal nervure, three below the cell near the abdominal margin and one above, several minute spots at the base.

Expanse: 48 mm.

*Hab.* Sierra Leone.

In the collection of the Hon. Walter Rothschild.

Allied to *A. terpsichore*, but differs principally in the absence of the discal row of small spots and of the lunules in the outer marginal black band on the underside of the posterior wings of those species.

### 3. *Acraea althoffi* Dewitz.

♀. *Upperside*: anterior wings dusky brownish grey with an obscure greyish white diffused band towards the end of the cell edged externally by an irregular dusky

black bar and an obscure dark grey spot on its inner side, the transverse and oblique rufous bands of the male are represented by similar greyish white bands edged internally by greyish black, one black spot below the cell : posterior wings dusky brownish grey at the base, beyond which is a broad irregular sordid white band, thence to the outer margin dusky brownish grey, with submarginal whitish streaks in the interspaces crowned by dusky dark grey rays which extend partially into the central sordid white area.

*Underside* : paler, with conspicuous greyish black spots in the middle and towards the end of the cell and below it, a narrow marginal white streak in each interspace, which is duplicated below the lowest median nervule.

On the posterior wings the central white band becomes indistinct, the basal spots are smaller and less numerous than in the male, the subconical white streaks in the interspaces on the outer margin as on the upperside, but the dark rays crowning them extend across the disc nearly to the cell.

Expanse : 70 mm.

*Hab.* Port Alice, Uganda (Ansorge).

In the collection of the Hon. Walter Rothschild.

#### 4. *Acraea pomponia* sp. nov.

♂. *Upperside* : both wings dark brown nearly black, anterior wings with an oblique hyaline band of three spots before the apex, and three oval rufous brown spots on the disc between the median nervules, the upper spot minute, the lowest the largest : posterior wings crossed about the middle by an irregular rufous brown band.

*Underside* : anterior wings with the rufous brown spots much less conspicuous, the apex and outer margin fulvous crossed by dark rays between the veins : posterior wings with the basal two-thirds rather bright pale fulvous, the outer third crowned by an irregular black band with a series of black rays between the veins to the outer margin, bordered on either side by pale fulvous markings, one black spot in the cell towards its base, and a series of other spots of irregular size in the basal half of the wings.

Expanse : 41 mm.

*Hab.* Usukama.

In the collection of Mr. Grose-Smith.

Nearest to *H. peneleos* Ward, but a smaller insect ; the rufous brown band crossing the posterior wings is narrower, and the anterior wings are more opaque.

#### 5. *Acraea pelasgius* sp. nov.

♂. *Upperside* : anterior wings greyish brown semi-vitreous, three vitreous spots placed obliquely before the apex, outside which and following the contour of the outer margin to the outer angle is a series of brown rays or markings between the veins, the uppermost the shortest, the marking between the two lowest median nervules the most elongate ; those on either side of the submedian nervure confluent : posterior wings bright brown, with marginal dark rays along the veins and in the interspaces, four black spots in the cell ; numerous others clustered round the cell and towards the base.

*Underside*: anterior wings bordered outwardly all round by a dusky brown band very broad at the apex, crossed by the dark veins and rays in the interspaces, the subapical oblique vitreous band as on the upperside, the brown rays or markings of the upperside scarcely visible: posterior wings pinkish brown, paler towards the margin, the veins and rays crossing the disc darker brown, a conspicuous pale biscuit-coloured band crosses the disc just beyond the cell which it partially invades; on the inner edge of the band is a row of round black spots of unequal size, two spots in the cell and several others clustered around.

Expanse: 53 mm.

*Hab.* Port Alice, Uganda (Ansorge).

In the collection of the Hon. Walter Rothschild; nearest to *A. parrhasius* Fabr.

#### 6. *Acraea toruna* sp. nov.

♂. *Upperside*: anterior wings differ from those of *A. johnstoni* Godm. in the ground colour of the basal three-fourths of the wings being uniformly bright rufous brown; in place of the two pale tawny spots towards the apex of *A. johnstoni* is a broad pale tawny band, divided into four by the veins, which crosses the wings obliquely; the lowest of the four divisions is elongated outwardly and also inwardly by a narrow line along the upper median nervule to the end of the cell, inside which is a small triangular tawny spot, the two pale tawny spots on the disc on either side of the lowest median nervule are closer together than in *A. johnstoni*; the pale band on the posterior wings is brighter and better defined on its inner edge by the dark rufous brown basal area.

*Underside*: anterior wings paler than above. Posterior wings with the base bright chocolate brown, edged externally by an irregular row of confluent black spots, a small spot before the precostal nervure and two others at the base, otherwise as on the upperside.

♀. *Upperside*: basal half bright rufous brown followed by a transverse bright tawny band which crosses the wings from the costa to the inner margin, elongated on each side in the region of the upper median nervule, with a minute spot at the end of the cell as in the male, the area beyond the band dark brown: posterior wings as in the male.

*Underside*: anterior wings with the basal three-fourths paler than on the upperside, the transverse median pale band being scarcely distinguishable.

Expanse: ♂, 51 mm.; ♀, 60 mm.

*Hab.* Kimbugu, Toru (Ansorge).

In the collection of the Hon. Walter Rothschild.

#### 7. *Planema alicia* sp. nov.

♂. *Upperside*: anterior wings crossed by a bright fulvous band resembling the band in *P. excisa* Butl., the rest of the wings darker than in that species. Posterior wings bright fulvous on the disc, becoming more rufous towards the base and darker at the apex, the dark area narrowing towards the anal angle, dark rays between the veins from the outer margin to near the cell.

*Underside*: anterior wings with the inner edge of the fulvous band defined by a very zigzag band, more irregular than in *P. excisa*: posterior wings dark chocolate brown, becoming rufous at the base, with a badly defined pale band



crossing the middle of the wings beyond the cell, two spots in the cell and a cluster of spots round it, but all much smaller and less regularly placed than in *P. excisa*, in which a regular band of spots crosses the wings a little before the middle.

♀. *Upperside* : anterior wings do not differ from the male : posterior wings with the ground colour the same as the anterior wings, but rather paler, the wings crossed about the middle by a broad irregularly defined white band, which is narrowest on the costal margin.

*Underside* : as in the male, but on the posterior wings the indistinct pale band is broader and whiter.

Expanse : 67 mm.

*Hab.* Port Alice, Uganda (Ansorge).

In the collection of the Hon. Walter Rothschild.

#### 8. *Planema paragea* sp. nov.

♂. *Upperside* : both wings cinereous grey, the anterior rather darker than the posterior wings. Anterior wings with a narrow irregular obscure greyish white band crossing the discoidal nervules obliquely, thence turning at right angles between the two upper median nervules, another narrow band of the same colour crosses the disc below the cell from the middle median nervule to near the inner margin, where it becomes obsolete. Posterior wings with an obscure dusky white band crossing the wings before the middle, the basal spots on the underside faintly visible.

*Underside* : resembles the upperside, but on the anterior wings the greyish white bands are broader, and the space between them and the base is darker grey ; on the posterior wings the basal area is brown, with a cluster of black spots arranged irregularly within it.

The *female* resembles the *male*, but is larger, and the greyish white bands on the anterior wings are broad and more distinct.

Expanse : ♂, 51 mm. ; ♀, 70 mm.

*Hab.* Port Alice, Uganda (Ansorge).

In the collection of the Hon. Walter Rothschild.

Belongs to the group of *A. gea* Fabr.

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ON THE GENUS *SCAEORHYNCHUS* OATES.

By ERNST HARTERT.

MR. EUGENE W. OATES has in Vol. I. of the "Birds of India" most rightly separated this genus from *Paradoxornis* and *Suthora*, into which two genera the members of the new genus were formerly placed by the different authors, while he most correctly united the so-called "*Chleuasicus*" with *Suthora*. Mr. Oates' genus contained two species: *S. ruficeps* (Blyth) and *S. gularis* (Gray). Both these species can be divided into several subspecies, so that the genus will have to stand as follows:—

1a. *Scaeorhynchus ruficeps ruficeps* (Blyth).

Bill smaller, wing a little shorter, under-surface white, tinged with brownish buff along the sides of the body. Bill whitish horny (Elwes). Bill from forehead to tip in a straight line 14 mm., wing 84—86 mm.

Sikkim and Buthan.

1b. *Scaeorhynchus ruficeps bakeri* subsp. nov.

Bill larger, wing a little longer, under-surface tinged with brownish buff all over. Maxilla of bill dark horn-brown (Baker). Bill from forehead to tip in a straight line 16 mm., wing 90—95 mm. The bill is not only longer, but also higher and much thicker. Its colour is darker in the skins, and the notes of the collectors on our label agree with this. This new subspecies is named in honour of my friend E. C. Stuart Baker, whom I met in Calcutta in 1888, and who has since become an authority on Indian oology.

Type of subspecies: ♂ Hungrum, North Cachar, 3. 5. 1895, E. C. S. Baker coll.

Cachar, Assam, to Karennee and Tenasserim.

2a. *Scaeorhynchus gularis gularis* (Gray).

Of medium size, underside white, bill about 12—13 mm. (measured as before), wing 91—93 mm.

Sikkim and Buthan.

2b. *Scaeorhynchus gularis transfluvialis* subsp. nov.

Smaller, bill less powerful, underside mostly more suffused with fulvous buff. Bill of the same length as that of *S. gularis gularis*, but not so thick. Wing 86—89.5 mm.

Cachar, Khasia Hills, and probably Karennee.

Type: ♂ Guilang, North Cachar, 21. 4. 1895, collected by E. C. Stuart Baker. The name is chosen with regard to the home of this form south of the Brahmaputra valley, which evidently separates many forms of the Assamese mountain-ranges from those of the Himalayas.

2c. *Scaeorhynchus gularis fokiensis* (David).

The largest of the three forms of *S. gularis* which seem to be recognisable. On the whole very much like *S. gularis gularis*, but larger, the black throat-patch lower down than in *S. gularis gularis* and *transfluvialis*, and leaving a distinct space white on the chin, instead of reaching nearly or entirely the base of the bill. The ear-coverts seem to be darker. Underside white. Wing 98—99; bill (measured as before) 15—15.5 mm.; tail nearly 90 mm. instead of about 85 in *S. gularis gularis* and in *S. gularis transfluvialis*.

Fokien, China.

I have examined examples from the collection of Mr. De La Tonche.

## LIST OF A COLLECTION OF BIRDS FROM THE LINGGA ISLANDS.

By ERNST HARTERT.

FOR a number of years it was the late Mr. Alfred Everett's wish and intention to explore the little group of the Lingga Islands, south of Singapore, in order to ascertain whether their fauna was entirely that of the Malay Peninsula, a continuation of which this group seems to be, or whether it had any admixture of the fauna of Sumatra, or any peculiar forms. Unfortunately our friend never reached the Lingga Islands himself, but during his last illness in Singapore he sent some of his trained Bornean bird-skinners there, who made a small collection of bird-skins, a list of which follows hereafter.

This collection contains only purely Malaccan forms, and would thus show that the Lingga fauna was entirely that of the Malay Peninsula, but it is too incomplete for any final statement, though it is of interest that such forms, which one expects to show local variation, do not differ. It is the first bird-collection ever made on these islands, as far as I am aware.

In a collection of mammals made on the Lingga Islands by Mr. Abbott only one new form (*Mus lingensis*) has been separated by Mr. Miller (cf. P. Wash. Acad. Sci. ii. pp. 206, 242; 1900).

1. *Cittocincla tricolor* (Vieill.) Two jun.
2. *Orthotomus ruficeps* (Less.). ♂ ♀. These two specimens seem to be rather small, but the male has the wing worn and is moulting, and one from Palawan as well as two from Borneo are about equally small.
3. *Anuropsis malaccensis* (Hartl.). Two.
4. *Stachyris davisoni* Sharpe (*natunensis* Hartert). Two ♂♂, one ♀.
5. *Malacopternum cinereum* Eyton. ♂ ♀.
6. *Malacopternum magnirostre* (Moore). Three specimens. Messrs. Oates and Büttikofer are doubtless correct in placing this species in the genus *Malacopternum* instead of *Turdinus*.
7. *Trichastoma rostratum* Blyth. One ♀. I may call attention to the fact, that many Malaccan examples are more rufous than Bornean ones, while others do not show this difference at all.

8. *Mixornis gularis* (Raffl.). ♂ ♀.
  9. *Alophoixus phaeocephalus* (Hartl.). Two specimens.
  10. *Hemixus malaccensis* (Blyth). Common.
  11. *Aegithina viridissima* (Bp.). ♂ ad., ♂ juv.
  12. *Chloropsis icterocephala* (Less.). Two examples.
  13. *Hemipus obscurus* (Horsf.). ♂ ad.
  14. *Rhinomyias pectoralis* (Salvad.). ♂ ♀.
  15. *Culicicapa ceylonensis* (Swains.). Common.
  16. *Hypothymis azurea* (Bodd.). Two skins.
  17. *Terpsiphone affinis* (Hay). One *female* and one adult *male* with a very long tail in perfectly red plumage.
  18. *Dissemurus platurus* (Vieill.). Several adult specimens.
  19. *Anthreptes malaccensis* (Scop.). Common.
  20. *Cinnyris hasselti* (Temm.). One ♂ ad.
  21. *Cinnyris pectoralis* (Horsf.). One ♂ ad.
  22. *Chalcostetha insignis* (Temm.). ♂ ♀.
  23. *Arachnothera longirostris* (Lath.). Two *females*.
  24. *Dicaeum trigonostigma* (Scopoli). One ♂, one ♀.
  25. *Dendrophila frontalis* (Swains.). ♂ ♀.
  26. *Eurylaemus ochromelas* Raffles. ♂ ♀.
  27. *Calypomena viridis* Raffles. One ♀, with a very short wing.
  28. *Collocalia linchi* Horsf. & Moore. Two *females*.
  29. *Macropteryx comata* (Temm.). ♂ ♀.
  30. *Batrachostomus stellatus* (Gould). One *male*.
  31. *Thriponax javensis* (Horsf.). Two *females*, with their wings only 218 and 226 mm. in length. The size of this woodpecker seems to be rather variable. Large series from the various localities whence it is recognised might possibly enable us to make some subdivisions.
  32. *Ceyx innominata* Salvad. Three specimens.
  33. *Rhopodytes sumatranus* (Raffl.). One example.
  34. *Coccytes coromandus* (L.). One ♀.
  35. *Cuculus canorus canoroides* (S. Müll.). One specimen.
  36. *Surniculus lugubris* (Horsf.). One ♂ ad.
  37. *Chalcococcyx xanthorhynchus* (Horsf.). One ♂ ad.
  38. *Ninox scutulata* Raffl. One specimen.
  39. *Siphia banyumas* (Horsf.). ♂ ad.
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## THE BIRDS OF THE BANDA ISLANDS.

BY ERNST HARTERT.

THE Banda Islands, south of Ceram, consist of one large island, Great Banda or Lonthoir, and nine small islands. They are close together, and the fauna on all of them must evidently be the same. They are all elevated, and have a number of recent volcanoes, the outbreaks of which have frequently devastated vast parts of these islands. Each island is fringed with a coral reef. These islands have been cultivated from very early times, and the population has long been very dense. The Banda Islands are supposed to be the home of the nutmeg tree, and they are very fertile. Owing to the present scarcity of old primeval forest and the density of the population, they are not particularly rich in species of birds, nor are they a specially good collecting ground. However, as birds from these islands are scarce in museums, and as some of the species are not known to occur anywhere else, we asked our able correspondent Mr. Heinrich Kühn to collect bird-skins on the Banda Islands. He sent us a fine collection from Great Banda, containing all the species known to be peculiar to the group. We also received a few skins collected by our friend Mr. William Doherty from Banda Neira.

I am herewith offering a complete list of these collections, which may serve fairly well as a list of the birds occurring on the Banda Islands.

We became first acquainted to a large degree with Banda birds through the extensive collections made on Banda by one of the best collectors who ever traversed the Eastern Archipelago—the excellent Salomon Müller, who described nearly all the peculiar species in his great work “*Verhandlungen over de natuurlijke Geschiedenis der Nederlandsche overzeesche Bezittingen*,” in footnotes in the volume entitled “*Land en Volkenkunde*” (Leiden, 1839—1844), namely, *Rhipidura squamata*, *Myzomela boiei*, *Zosterops ehloris*.

Herr von Rosenberg collected also birds on Banda, and so did Wallace, Hoedt, and the naturalists of the *Challenger* (Salvadori, *Proc. Zool. Soc.* 1878, pp. 83—85, seven species enumerated); but complete lists of the best of these collections are not published.

Our collection contains the following 29 species :

### 1. *Astur polionotus* Salvad. (*antea*, p. 20.)

I cannot separate the Banda specimens from those collected on Dammer Island. The *female*, with a reddish tinge and faint indication of cross-bars on the thighs (see p. 20), is not lighter than the lightest examples from Dammer. We have no *male* from Dammer. The *male* from Banda has a broad and distinct rufous collar on the upperside; the underside is uniform, only the abdomen having some indications of bars. A young *male* (apparently in first plumage) is on the upperside deep brown, with rufous edges and concealed wide rufous cross-bars to the feathers; the under-surface is rusty buff with wide cross-markings; the chest has longitudinal markings.

2. *Myzomela boiei*. (S. Müll.)

We have received a beautiful series from Great Banda, and a *male* from Banda Neira. "The iris is dark brown, feet plumbeous, bill black." In the *females* the feet seem to be less bright, more brownish. This species is evidently restricted to the Banda group.

3. *Zosterops chloris* S. Müll.

Common on Great Banda. We have also two specimens from Banda Neira, one of which has an abnormally large bill, while the other agrees with the series from Great Banda. The iris of those from Great Banda, which were shot in September and October, is marked by Kühn as "bright brown," while Doherty described that of the two examples from Banda Neira as "pale brown." The feet are "dark grey, bill blackish." This species is also, as far as known, restricted to the Banda Islands.

4. *Motacilla boarula melanope* (Pall.).

Several were shot in October 1898 on Great Banda.

5. *Edoliosoma dispar* Salvad. (*anteà*, p. 15).

Great Banda, September and October.

6. *Pachycephala phaeonota* (Bp.).

Great Banda, common, and Banda Neira. "Iris bright brownish grey, feet pale flesh-colour, bill black." Originally described by Bonaparte (ex Müller, MS. in Mus. Lugd.) from Banda.

7. *Monarcha inornatus* subsp. (?)

A series from Banda all have very deep rufous abdomina, while the grey of the upper surface is in some as light as in examples from Dammer, which I take to agree with *M. i. kisserensis*, and others are distinctly darker. I am not yet ready to discuss the forms of this Flycatcher.

8. *Rhipidura squamata* S. Müll.

Described by Müller from Banda, where it is still common. "Iris brown, feet dark plumbeous, bill brownish black." The *female* has a shorter wing than the *male*.

It seems very strange that this bird should also be found in Waigin, and I should not be surprised if a good series proved that Count Salvadori's original opinion that it differed from the Banda form was after all correct. (Cf. *Ann. Mus. Civ. Genova* VII. p. 924, *Proc. Zool. Soc. London* 1878 p. 84.)

9. *Pitta vigorsi* Gould.

We have received a beautiful series from Banda. The *female* does not seem to differ from the *male*. There is a difference in size—the length of the wing differing from 5 to 8 mm.—but this is not sexual, unless some of our specimens are erroneously sexed. “The iris brown, legs and feet brownish flesh-colour, bill black.”

We have this species now from Great Banda (Kühn), Banda Neira (Doherty), Dammer (Kühn, *antea*, p. 18), Kilsoein in the Koer group (Kühn), Taam (Kühn), and Kisoei (Kühn); and it is also on record from Timorlaut, but we have no specimens from that locality.

10. *Halcyon chloris* (Bodd.).

Great Banda and Banda Neira, common. Large birds, back greenish blue, wings rather bright blue; wings 111 to 116 mm.

11. *Eurystomus orientalis australis* Swains.

One from Great Banda, September.

12. *Cuculus canorus intermedius* Vahl.

Great Banda, October.

13. *Eudynamis cyanocephalus everetti* Hartert.]

(See *antea*, pp. 231 and 232). The *female* from Great Banda agrees with those from the Lesser Sunda Islands and the Key Islands. The iris is “vermilion,” feet and bill “plumbeous.” Wing 195 mm.

14. *Chalcophaps chrysochlora* (Wagl.).

Common on the Banda Islands.

15. *Carpophaga concinna* Wall.

Two *males* from Great Banda. They are what I consider typical *C. concinna*, and not *C. concinna separata* from the Key Islands, which is much more whitish on the under-surface, especially on the foreneck, chest, belly, and thighs. (Cf. Nov. Zool. III. p. 180, 1896.)

16. *Ptilinopus wallacei* Gray.

A fine series from Great Banda. I am not aware that this species is previously recorded from Banda, but our specimens from that locality agree perfectly with our series from the Key Islands and from Timorlaut. “Iris reddish orange, feet crimson lake, bill sulphur yellow.”

17. *Ptilinopus xanthogaster* (Wagl.).

Great Banda and Banda Neira. “Iris yellow, feet dirty olive green, bill dirty greenish yellow.”

Some specimens from the Key Islands are larger than any others before me, otherwise there is no difference between those from various localities.

18. *Numenius phaeopus variegatus* (Scop.).

Great Banda.

19. *Glottis nebularius* (Gunner).

♀. Great Banda, August 1898.

Ornithologists who do not recognise the tenth edition of Linnaeus' "Systema Naturae" should call this bird *Glottis totanus* ! (Cf. *Cat. B. Brit. Mus.* XXIV. p. 481.)

20. *Tringoides hypoleucus* (L.).

Great Banda.

21. *Terekia cinerea* (Güldenst.).

Great Banda.

22. *Totanus stagnatilis* Bechst.

A fine *male* was shot on Great Banda in October.

23. *Tringa subarquata* (Güldenst.).

Great Banda, October.

24. *Limonites ruficollis* (Pall.).

Great Banda.

25. *Heteractitis brevipes* (Vieill.).

Common on Banda.

26. *Ochthodromus geoffroyi* (Wagl.).

Common.

27. *Ochthodromus mongolus* (Pall.).

Two specimeus.

28. *Megapodius duperreyi* Less & Garn.

Two examples from Great Banda.

29. *Gelochelidon anglica* (Mont.).

♀. Adult, October 1898.

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THE *LEPIDOPTERA* OF BURU.

By W. J. HOLLAND, PH.D., LL.D., F.Z.S., F.E.S., ETC.

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PART II.—HETEROCERA.

FAMILY *EUPTEROTIDÆ*.

GENUS *CALAPTEROTE* gen. nov.

♂. Palpi minute, erect, appressed to front; antennae short, rather heavily bipectinate, the setae depressed; legs short and moderately hairy. Forewing broad, the outer margin evenly rounded, the inner margin straight; the discocellulars evenly curved; vein 6 from near the upper angle of the cell; veins 7, 8, and 9 issuing from the extremity of a long stalk, rising from the upper angle of the cell, which also carries veins 10 and 11 at its anterior extremity just beyond the cell;



NEURATION OF *Calapterote butleri* ♂.

veins 10 and 11 are parallel to each other and to the extremity of vein 12. Hindwing subtriangular, with its outer margin rounding into the anterior margin, the inner margin straight, with the edge folded over on the upper surface of the wing; discocellulars angled at the origin of vein 5; vein 4 from lower angle of cell and vein 6 from upper angle; veins 3 and 7 from before angle of cell; in the cell near the base is a small oval depression, or pit, with incrassated edges.

150. *C. butleri* sp. nov.

♂. Uniformly pale ochreous, shading on the upperside of the primaries into very pale brown.

Expanse : 42 mm.

FAMILY *SPHINGIDÆ*.

GENUS *CHAEROCAMPA* Duponchel.

151. *Ch. lucasi* Walker, *Cat. Lep. Het. B. M.* VIII. p. 151.

152. *Ch. punctivenata* Butler, *P.Z.S. London*, 1875, p. 248.

This I consider a variety of *butus* (Cramer).

GENUS *ANGONYX* Boisduval.

- 153.
- A. testacea*
- (Walker),
- Cat. Lep. Het. B. M.*
- VIII. p. 102.

GENUS *PROTOPARCE* Burmeister.

- 154.
- P. convolvuli*
- (Linnaeus),
- Syst. Nat.*
- I. p. 490.

- 155.
- P. triangulifera*
- , sp. nov.

♂. Head, thorax, and abdomen on the upperside grey, the abdomen black on the sides with white segmental streaks. There are a few rufous hairs on the first segment near the insertion of the hindwing. The underside of the abdomen is white with a series of triangular black spots marking the anterior segments. The forewings are dark grey, banded by basal, subbasal, and median curved blackish lines, and marked with a similarly coloured spot on the outer margin and at the apex. There is a distinct circular white spot at the end of the cell. The hindwing is pale grey, somewhat clouded on the inner margin by obscure black lines. There is a whitish grey triangular mark at the anal angle. The fringes of both wings are black, checkered with white. On the underside the wings are grey, slightly paler toward the base. The hindwing is crossed by an obscure dark median line parallel to the outer border. The antennae are white, with the setae dark brown.

Expanse: 98 mm.

GENUS *PSEUDOSPHINX* Burmeister.

- 156.
- P. discistriga*
- (Walker),
- Cat. Lep. Het. B. M.*
- VIII. p. 209.

GENUS *MACROGLOSSUM* Scopoli.

- 157.
- M. alcedo*
- Boisduval,
- Voyage Astrolabe, Léop.*
- p. 188.

158. (?)
- M. sitiene*
- (Walker),
- Cat. Lep. Het. B. M.*
- VIII. p. 92.

- 159.
- M. burnensis*
- sp. nov.

♂. The palpi on the upperside, the collar, and the anterior portion of the thorax are dull olive green, shading on the posterior portion of the thorax into deep black. The upperside of the abdomen is deep black, the segments being lightly marked on the anterior edge with white. The palpi on the underside and the pectus as well as the anterior pair of legs are pure white. The abdomen on the underside is black with lateral tufts of black hair tipped with snow white. There are a few minute white spots on the median line of the abdomen on the underside. There are two tufts of coal black hairs at the end of the abdomen. The anterior wings on the upperside are violet brown crossed by a basal, median, and postmedian band of dark brown, the latter band invaded and interrupted in the region of the median nervules and at the apex by patches of the prevalent ground colour. The hindwing is jet black, on the anterior margin pale purplish brown. On the underside both wings are smoky except at the base, where they are pure white.

Expanse: 53 mm.

This distinctly marked species is represented by a single specimen which does not agree with the description of any species known to me, and is not represented, so far as I am aware, in any other collection. Sir George Hampson informs me that it is not contained in the British Museum, and is entirely unknown to him.

FAMILY SYNTOMIDAE.

GENUS ERESSA Walker.

160. **E. furva** Hampson, *Cat. Lep. Phal.* I. p. 115.

The collection contains twenty or more specimeus of this species.

GENUS EUCHROMIA Hübner.

161. **E. bourica** (Boisduval), *Voyage Astrolabe, Lép.* p. 194.

Apparently very common.

162. **E. creusa** (Linnaeus), *Syst. Nat.* I. p. 494.

Not nearly so common as the preceding species.

FAMILY ZYGAENIDAE.

GENUS HETEROPAN Walker.

163. **H. scintillans** Walker, *Cat. Lep. Het. B. M.* II. p. 441.

Three specimens.

GENUS HETERUSIA Hope.

164. **H. hampsoni** sp. nov.

♂. Head black, upperside of thorax and abdomen black, shot with deep violet blue, the collar and patagia being deep iridescent blue. Legs black, margined with iridescent green. Forewing elongated and narrow, black, shot at the base with iridescent purplish blue, crossed at the middle by a band of vermilion extending from the costa across the cell to the inner angle, diminishing in width from the cell to the inner angle. There is a subapical band of deep violet blue, divided into six linear spots by the nervules. The hindwing on the upperside is velvety black, marked lightly with blue on the costal margin and broadly marked with lustrous blue on the inner margin. On the underside the wings are marked as on the upperside, but the bands of vermilion and blue on the primaries are more diffuse and the violet blue of the secondaries is more extended, covering almost the entire under surface of the wing.

Expanse : 50 mm.

FAMILY COSSIDAE.

GENUS DUOMITUS Butler.

165. **D. hyphinoë** (Cramer), *Pap. Exot.* II. t. 154.

A single pair.

FAMILY CALLIDULIDAE.

GENUS CLEOSIRIS Boisduval.

166. **C. catamita** (Geyer), *Zutr. Exot. Schmett.* IV. f. 653. 654.

Apparently not common in Buru.

GENUS *CLEIS* Guérin.

167. *C. dichroa* (Boisduval), *Voyage Astrolabe*, *Lép.* p. 260.

168. *C. propinqua* Butler, *Ann. Nat. Hist.* (4), XIX. p. 394.

There are two species of *Cleis* in the collection, each represented by both sexes. The determination of these is a matter of some difficulty. Boisduval, l.c., describes a species of this genus from Buru under the name *dichroa*. His description is as follows: "Ailes d'un noir brun; les supérieures avec une bande transverse orangée, commençant à la côtelé; les inférieures sans taches\*"; (femelle) ayant les inférieures avec une bande terminale orangée; dessous semblable; celui des supérieures avec quelques petits traits violets."

Now this description of the *male* given by Boisduval exactly applies to the *male* of one species, and of the *female* to the *female* of the other species.

I solve the problem by taking the name *dichroa* Boisduval for the *male*, the *female* of which is exactly like the *male* in the colouration and markings of the wings, except that the orange band of the primaries is reduced in width and not so conspicuous.

The other species, of which I have five *males* and six *females*, has an orange band on the secondaries, obsolescent on the upperside in most examples, though always indicated, but very conspicuous on the lowerside. The *female* has this band enlarged and conspicuous on both the upper- and lowersides of the secondaries, while there is a strong tendency in the transverse band of the primaries to become obsolete in this sex. In one example it is broad and conspicuous, and in another it is reduced to a small orange spot near the outer angle, and the two are connected by intermediate forms. Both *males* and *females* are exactly alike on the underside.

This species is, I think, without doubt *Cleis propinqua* Butler, see Pagenstecher, *Jahrb. Nass. Ver. Nat.* XL. p. 222.

The synonymy works out thus:—

a. *Cleis dichroa* Boisduval; *male*.

b. *Cleis propinqua* Butler; *male*.

„ *dichroa* Boisduval; *female*.

The species figured as *dichroa* by Pagenstecher, *Jahr. Nass. Ver. Nat.* XL. t. 1. f. 7. 8, is not the insect found in Buru, whence Boisduval obtained his types. Unfortunately, Dr. Pagenstecher does not indicate the sex of the specimens figured.

FAMILY *THYRIDIDAE*.GENUS *ADDAEA* Walker.

169. *A. polygraphalis* (Walker), *Cat. Lep. Het. B. M.* XXXIV. p. 1245.

A single specimen.

GENUS *STRIGLINA* Guenée.

170. *S. scitaria* (Walker), *Cat. Lep. Het. B. M.* XXVI. p. 1488.

Five examples.

\* Italics mine.



GENUS RHODONEURA Guenée.

171. **R. intimalis** (Moore), *Lep. Atk.* p. 213.

One poor specimen, so determined by Sir George Hampson.

172. **R. atriclathrata** (Warren), *Nov. Zool.* III. p. 340.

A single example.

173. **R. polygraphalis** (Walker), *Cat. Lep. Het. B. M.* XXXIV. p. 1240.

A solitary male.

FAMILY LYMANTRIIDAE.

GENUS EUPROCTIS Hübner.

174. **E. varians** (Walker), *Cat. Lep. Het. B. M.* IV. p. 796.

Apparently not scarce.

GENUS CAVIRIA Walker.

175. **C. buruana** sp. nov.

♂. Pure silvery white; palpi creamy yellow; legs white; antennae pale grey.  
Expanse: 30 mm.

FAMILY AGANAIDAE.

GENUS NEOCHERA Hübner.

176. **N. stibostethia** (Butler), *Trans. Ent. Soc. Lond.* 1875 p. 329.

Seven specimens. One female has the hindwings almost entirely black, showing a tendency to melanism in the species.

GENUS ASOTA Hübner.

177. **Asota alciphron** (Cramer), *Pap. Exot.* II. t. 133. f. E.

178. **Asota australis** (Boisduval), *Voy. Astrolabe, Léop.* p. 252. t. 5. f. 3.

179. **Asota heliconia** (Linnaeus), *Syst. Nat.* p. 511.

180. **Asota** sp. (?).

A single specimen, resembling a dwarfed specimen of *heliconia*, but wholly without the orange markings at the base of the primaries. The abdomen is black with the outer edges of the segments very narrowly edged with yellow.\*

FAMILY ARCTIIDAE.

GENUS RHODAREAS Butler.

181. **R. niceta** (Stoll), *Pap. Exot.* IV. t. 368. f. C.

A single female.

GENUS PANGORA Moore.

182. **P. pasinuntia** (Stoll), *Pap. Exot.* IV. t. 367. f. H.

One female.

\* See *Nov. Zool.* IV. p. 352. 353.—EDITORS.

183. *P. burica* sp. nov.

♂. Palpi and front dark brown; antennae black; collar white, bordered broadly behind with dark brown; patagia creamy white, with a black spot in their centres. Thorax on the upperside white, marked with four black spots; abdomen crimson, with a broad black dorsal stripe. The pectus, thorax, and abdomen on the underside are vermilion, the latter with some small black spots on the sides of the segments. The legs are brown, tinged with light red. On the upperside the wings are dark brown; the primaries have two small white spots at the base; there is a larger white spot towards the end of the cell, and two small subapical white spots. The secondaries have a patch of red at the base; which is confluent with the somewhat broad red band of colour which extends two-thirds of its length along the upper border of the costa, sharply defined at its extremity and on its inner margin by the dark brown ground colour of the wing. The wings on the underside are somewhat paler than on the upperside, and all the lighter spots of the upperside are reproduced, but are throughout pale vermilion in colour.

Expanse: 40 mm.

Sir George Hampson writes me that this species is not in the British Museum, but may be allied to *Meringocera plutonica* Felder. The latter species is represented in my collection by specimens from Macassar, and is evidently distinct from the species we are considering. It also does not agree with the description of *Meringocera tricolor* Pagenstecher.

## GENUS NYCTEMERA Hübner.

184. *N. aeres* (Boisduval), *Voyage Astrolabe*, *Lep.* p. 198.

Four specimens.

185. *N. baulus* (Boisduval), *Voyage Astrolabe*, *Lép.* p. 200.

Only one specimen.

186. *N. mundipicta* Walker, *Journ. Linn. Soc.* III. p. 184; Swinhoe, *Cat. Lep. Het. Mus. Oxf.* I. p. 141. t. 5. f. 14.187. *N. burica* sp. nov.

♂. Palpi black, front white, antennae blackish; vertex white; patagia white, with a black spot on the centre; upperside of thorax white, with a large black spot; upperside of abdomen white, with a row of small black spots forming a dorsal line; the pectus and underside of the abdomen white, the latter with a row of small black lateral brown spots; legs white, margined with blackish. The primaries on the upperside are black, with a large oblong white spot near the base, contiguous to the inner margin, and two small lenticular white spots near the base along the costa; beyond the oblong white spot at the origin of vein 2 is a small white spot; across the middle of the wing is a broad and very irregular white band, extending from the costa towards the inner margin, near the outer angle, which it does not reach; the lower part of this band is divided, the outer portion being rounded at its extremity, and the inner portion extending as a sharp tooth-like projection toward the middle of the inner margin, from which there arises a small triangular white spot, in some specimens coalescing with the tooth-like projection; beyond this band, near the

costa, are two subapical white spots and a large suboval apical spot; on the middle of the outer margin is a large subtriangular white spot. The secondaries on the upperside are white, margined broadly with black, marked at the outer angle by two small white spots, and on the middle of the margin by a subtriangular white spot which runs through the black margin and coalesces with the white surface of the wing. On the lowerside the spots and markings are reproduced as on the upperside. The *female* like the *male*. Expanse: ♂ 38 mm., ♀ 42 mm. Described from thirty-four examples, which show some variation in the size of the white spots and markings.

The species is evidently common, but quite different from any other species known to me, either by figures or descriptions of authors.

GENUS ARGINA Hübner.

188. **A. cribraria** (Clerck), *Icon. Ins.* II. t. 54. f. 4.

Two examples.

GENUS DEIOPEIA Stephens.

189. **D. pulchella** (Linnaeus), *Syst. Nat.* p. 534.

Quite common.

GENUS EILEMA Hübner.

190. **E. apicalis** (Walker), *Journ. Linn. Soc., Zool.* VI. p. 104.

A single specimen.

GENUS NISHADA Moore.

191. **N. flabrifera** Moore, *P.Z.S. Lond.* p. 23 (1878).

Two specimens.

GENUS SICCIA Walker.

192. **S. niasica** (Pagenstecher), *Jahrb. Nass. Ver. Nat.* XXXVIII. p. 25.

GENUS ASURA Walker.

193. **A. quadrilineata** (Pagenstecher), *l.c.* XXXIX. p. 126.

Two specimens.

GENUS MILTOCHRISTA Hübner.

194. **M. multidentata** Hampson, *Cut. Lep. Phal.* II. p. 493. t. 32. f. 24.

The type, which was submitted to Sir George Hampson, has been already described and figured by him, and there is therefore no need of characterising the species except to say that the figure given in Plate 32 of Hampson's Catalogue would never be recognised as a representation of the type without positive information to that effect, the dark lines being altogether too dark, and their outline being only a very rough approximation to nature. In most specimens the lines are very fine and quite faintly indicated.

195. **M. vepallida** sp. nov.

♂. Resembling the preceding species in size and outline. The anterior wings are pale stramineous, with only the faintest indication of transverse lines on the limbal area. The posterior wings are pure white. The body and legs are pale ochreous.

Expanse : 23 mm.

GENUS OCROSIA Hampson.

196. **O. reversa** (Walker), *Journ. Linn. Soc., Zool.* VI. p. 105.

GENUS DARANTASIA Walker.

197. **D. triplagiata** Hampson, *Cat. Lep. Phal.* II. p. 274. t. 25. f. 21.

The type, which is unique, has been already described and well figured by Sir George Hampson.

GENUS CACYPARIS Walker.

198. **C. elegans** (Butler), *Ann. Nat. Hist.* 5. XIX. p. 439.

FAMILY AGARISTIDAE.

GENUS IMMETALIA Jordan.

199. **Immetalia saturata** (Walker), *Lep. Het. B. M.* XXXI. p. 54.  
(1864) (Buru).

Twelve specimens, nine *males* and three *females*.

Swinhoe's figure of *saturata* in *Cat. Lep. Het. Oxf.* I. t. 5. f. 1. is apparently incorrect, the abdomen in my specimens not being ringed with blue as in the figure; the hindwing also is too blue in the figure.

GENUS PHALAENOIDES Lewin.

200. **P. micaceus** (Walker), *Cat. Lep. Het. B. M.* XXXI. p. 48.

One specimen.

GENUS OPHTHALMIS Hübner.

201. **O. lincea** (Cramer), *Pap. Exot.* III. t. 228. f. B.

Two examples.

GENUS DAHLIA Pagenstecher.

202. **D. hesperioides** (Pagenstecher), *Lep. Fauna Bismarck-Archipel*, in *Zoologica* II. p. 120. t. 1. f. 13.

FAMILY NOCTUIDAE.

GENUS PRODENIA Guenée.

203. **P. littoralis** (Boisduval), *Faun. Ent. Madag., Lép.* p. 91. t. 13. f. 8.

204. **P. synstictis** Hampson, *Fauna Brit. Ind., Moths* IV. p. 511.



GENUS AMYNA Guenée.

205. **A. selenampha** Guenée, *Noct.* I. p. 406.

206. **A. octo** id., *l.c.* p. 233.

GENUS CALLOPISTRIA Hübner.

207. **C. pulchrilinea** (Walker), *Journ. Linn. Soc., Zool.* VI. p. 190.

208. **C. recurvata** (Moore), *Lep. Atk.* p. 144.

GENUS ELUSA Walker.

209. **E. ceneusalis** (Walker), *Cat. Lep. Het. B. M.* XVI. p. 202.

210. **E. cyathicornis** Walker, *Journ. Linn. Soc., Zool.* VI. p. 194.

GENUS CARADRINA Ochsenheimer.

211. **C. exigua** (Hübner), *Samml. Eur. Schmettl., Noct.* f. 362.

GENUS LEOCYMA Guenée.

212. **L. tibialis** (Fabricius), *Ent. Syst.* III. 1. p. 661.

GENUS RIVULA Guenée.

213. **R. proleuca** sp. nov.

♂. Thorax and abdomen pale brown ; palpi pale brown ; underside of body and legs whitish. Primaries rich brown ; a silvery white line runs from the base to the apex, parallel to the costal margin, and an inner line of the same colour runs along the outer margin, defined outwardly by the dark plumbeous fringes. The hindwing on the upperside is uniformly fuscous ; both wings on the underside are pale testaceous, without lines or markings.

Expanse : 17 mm.

GENUS EUBLEMMA Hübner.

214. **E. virginea** (Guenée), *Noct.* II. p. 248.

GENUS ZAGIRA Walker.

215. **Z. divisa** (Walker), *Trans. Ent. Soc. Lond.* (3) I. p. 107.

GENUS DINUMMA Walker.

216. **D. placens** Walker, *Cat. Lep. Het. B. M.* XV. p. 1806.

GENUS DORANAGA Moore.

217. **D. leucospila** (Walker), *l.c.* XXXIII. p. 788.

GENUS HYBLAEA Fabricius.

218. **H. aterrima** sp. nov.

♂. Palpi black, margined below with white ; front and collar black ; patagia black, margined with deep chestnut brown ; upperside of thorax black, with a tuft

of chestnut brown hairs rising from either side of the metathoracic segment ; abdomen black on the upperside, on the underside the segments are narrowly margined with white ; the legs are black, margined inwardly with white ; the tarsi ringed with white. The forewings on the upperside are black, with the region of the outer angle broadly marked with chestnut brown ; there is also a broad and indistinct median and subapical oblique transverse shade of dark purplish grey visible on the wings ; the fringe, just at the apex of the primaries is white. The hindwings on the upperside are jet black, the fringe at the outer angle being for a short distance pure white. On the underside the primaries are a dark purplish brown, with three equidistant patches of white raised scales along the costa. The secondaries are black, with the inner margin as far as the cell bluish green ; a small spot of the same colour is situated near the base on the costa, and an irregular figure resembling the figure 6 placed on its side ( $\infty$ ) is located on the upper middle of the wing, extending from the costa to the cell. The *female* is like the *male*.

Expanse : 38—42 mm.

#### GENUS BLENNINA Walker.

219. *B. chrysochlora* (Walker), *l.c.* XXXIII. p. 935.

#### GENUS EUTELIA Hübner.

220. *E. scelerata* sp. nov.

♂. Antennae almost simple. Forewing with the outer margin slightly angled ; cilia crenulate. Tibiae almost naked ; palpi whitish ; head, collar, and upperside of thorax and abdomen purplish brown. Lower side of abdomen grey. Legs grey. On the upperside the forewing is purplish brown, with a small oval spot at the end of the cell, narrowly margined with pale grey. A number of indistinct transverse bands of dark brown traverse the wing, those on the limbal and apical areas being most conspicuous and being composed in part of raised scales. The hindwings are uniformly fuscous, slightly paler at the base. On the underside both wings are pale fuscous ; both are crossed by curved geminated limbal lines ; the secondaries have in addition an angulated median dark transverse line beyond the end of the cell, and a black spot in the cell at its extremity.

Expanse : 22 mm.

#### GENUS STICTOPTERA Guenée.

221. *S. costata* (Moore), *Lep. Ceyl.* III. p. 123. t. 159. f. 8.

222. *S. cuculliioides* Guenée, *Noct.* III. p. 52.

223. *S. brunneipennis* sp. nov.

♀. Front, collar, patagia, and the upperside of the thorax pale chestnut ; upperside of the abdomen fuscous ; lowerside of the abdomen pale yellowish grey. Primaries on the upperside are pale chestnut brown, crossed from the middle of the costa toward the inner angle with a darker brown shade, becoming deep black between veins 1 and 2. There is a submarginal band of small black spots extending parallel to the outer margin from the costa to the inner angle. Of these spots the one situated between veins 4 and 5 is quite large, and extends inwardly toward the base. Fringes concolorous. The secondaries on the upperside are fuliginous, the fringes pale grey. On the underside both wings are uniformly pale brown

the primaries being marked by a few pale spots on the outer edge of the costa, and having a narrow and very distinct subapical brown transverse line near the extremity, defined inwardly by pale ochraceous.

Expanse: 35 mm.

This species seems to be near *Stictoptera anthyalos* Swinhoe, but does not agree with his description.

224. *S. buruana* sp. nov.

♂ Palpi, front, head, and upperside of thorax and abdomen black; lower side of abdomen slightly paler. The primaries on the upperside are dark purplish grey, clouded over the basal half and on the limbal area by black. The fringes are fuscous, checkered with white. The hindwings are uniformly blackish, the fringes the same colour, checkered uniformly with white. On the underside both wings are fuscous, shading into blackish on the outer margins; a few indistinct lines, corresponding in location to those on the upper surface of the primaries appear on this side of the wings. *Female* like the *male*.

Expanse: 30 mm.

This appears to be a common species. The collection contains over twenty specimens which do not vary in the least.

225. *S. paranthyala* sp. nov.

♂. Palpi brown; front, collar, and thorax dark brown; upperside of the abdomen fuscous; lowerside of the thorax and abdomen ochraceous; legs ochraceous. The primaries are dark brown, crossed beyond the base by a pale brown band, somewhat irregular on its outer margin, and diminishing in width from the costa to the inner margin. This pale band is succeeded by a still broader band, which is parallel to it and to the inner margin, and extends from the costa two-thirds of its length from the base, gradually diminishing in width to the inner margin. Beyond this pale band is a dark, blackish brown shade, followed by lighter lines and waving dark lines. The fringes are uniformly dark fuscous, and crenulate. The hindwings on the upperside are dark fuscous, the fringes pale fuscous. On the underside the wings are uniformly pale fuscous, with a few paler marks on the costa and a quite distinct subapical transverse whitish line, which runs from the costa as far as vein 6. The *female* does not differ from the *male*.

Expanse: 28—30 mm.

This species appears to be common, the collection containing fourteen or fifteen specimens which do not vary at all and are quite uniform in their markings.

GENUS GYRTONA Walker.

226. *G. hylusalis* Walker, *Cat. Lep. Het. B. M.* XXVII. p. 93.

GENUS CAREA Walker.

227. *C. costiplaga* Swinhoe, *Ann. Nat. Hist.* (6) XII. p. 262.

GENUS ERCHEIA Walker.

228. *E. cyllaria* (Cramer), *Pap. Exot.* III. t. 251. f. C. D.  
229. *E. fusifera* (Walker), *Cat. Lep. Het. B. M.* XIV. p. 1398.

GENUS ANISONEURA Guenée.

230. *A. hypocyanea* Guenée, *Noct.* III. p. 162.

231. *A. salebrosa* Guenée, *Noct.* III. p. 161.

GENUS SPIREDONIA Hübner.

232. *S. diops* (Walker), *l.c.* XIV. p. 1297.

GENUS NYCTIPAO Hübner.

233. *N. crepuscularis* (Linnaeus), *Syst. Nat.* ed. XII. p. 811.

234. *N. ephesperis* Hübner, *Verz.* p. 272.

This species or form has a broad white median band running from before the middle of the costa of the forewing to near the middle of the inner margin of the hindwing. It is otherwise very near *crepuscularis*, with which Sir George Hampson makes it synonymous.

GENUS HYLODES Guenée.

235. *H. caranea* (Cramer), *Pap. Exot.* III. t. 269. f. E. F.

GENUS POLYDESMA Boisduval.

236. *P. metaspila* (Walker), *l.c.* XIII. p. 1032.

237. *P. inangulata* (Guenée), *Noct.* III. p. 210.

238. *P. graphica* sp. nov.

♂. Palpi erect, divergent; antennae simple; the forelegs with the femur very hairy; tibiae provided with a very long, dense, wide-spreading fascicle of hair almost reaching to the extremity of the tarsi and concealing them; front and head pale brown; eyes black; patagia and upperside of thorax pale wood brown; upperside of abdomen pale brown, underside lighter in colour; the legs wood brown. The primaries on the upperside are wood brown, traversed by a dark median band, with a dark brown shade on the limbal area; a dark brown spot is found on the costa a little before the base; a dark brown spot, made up of zigzag lines blending with each other, is found near the base, just below the cell, between the median and submedian nervules; beyond the brown shade which crosses the middle of the wing, and located on the submedian vein, is a dark brown or black spot, irregular in shape; a multitude of minute waved lines and dots appear upon the lighter surface of the wing; a crenulated dark brown line defines the outer margin; the cilia are wood brown. The secondaries on the upperside have the anterior margin immaculate and pale fuscous; the inner half of the wing is marked with spots and strigae, a prominent dark brown spot being located between the second and third median nervules; the outer margin of this wing is, like the primaries, defined by a crenulated dark brown line; the fringes are as on the primaries. On the underside both wings are uniformly pale fuscous, with only a slight trace of a median transverse band.

Expanse: 42 mm.

Sir George Hampson informs me that this interesting insect should constitute the type of a new subgenus under *Polydesma*, but I leave the honour of erecting the subgenus to others, as the weather is too hot to bother with it just now.



## GENUS CYCLODES Guenée.

- 239.
- C. omma**
- (Hoeven),
- Tijl. Nat. Gesch.*
- VII. p. 281. t. 7. f. a. b.

## GENUS OPHIUSA Ochsenheimer.

- 240.
- O. melicerte**
- (Drury),
- Ill. Exot. Ins.*
- I. p. 46. t. 33. f. 1.

- 241.
- O. joviana**
- (Cramer),
- Pap. Exot.*
- IV. t. 399. f. B.

## GENUS HYPAETRA Guenée.

- 242.
- H. includens**
- (Walker),
- Cat. Lep. Het. B. M.*
- XIII. p. 1107.

## GENUS PLECOPTERA Guenée.

- 243.
- P. antigona**
- sp. nov.

♂. Front, collar, patagia, and upperside of thorax ochraceous; upperside of abdomen rufous grey; the underside of the abdomen whitish; legs whitish, with the hairs on the tibiae dark grey. The primaries on the upperside are pale grey, tinged near the costa with yellowish; at the end of the cell there is a small annular spot; a broad submarginal brown line runs from the costa before the apex to the inner margin before the inner angle, followed outwardly by a brown shade, irregularly defined on its outer margin; a series of small dark brown points accentuates the extremity of the nervules; the fringes are concolorous; two minute brown spots are located on the interspace between the median and submedian veins, one below the cell near the origin of the first median nervule, the other about the middle of the interspace behind the brown submarginal line. The secondaries on the upperside are pale ashen grey, with the outer third covered by a blackish band; the inner margin is shaded with darker grey; there is a minute discocellular spot on the underside. Both wings are pale grey, laved with ochraceous at the base and on the costa. The outer thirds of both primaries and secondaries are blackish. There is a lunate black spot at the end of the cell of the primaries, and a round discocellular spot at the end of the cell of the secondaries; between this spot on the secondaries and the outer margin there is an irregular, fine, zigzag, black line.

♀. The *female* is marked exactly like the *male*. The specimen before me is, however, a trifle smaller than the *male*.

Expanse: *male*, 35 mm.; *female*, 30 mm.

Described from a single *male* and a single *female*.

## GENUS ACANTHOLIPES Lederer.

- 244.
- A. similis**
- (Moore),
- Lep. Atk.*
- p. 174. t. 6. f. 5.

## GENUS REMIGIA Guenée.

- 245.
- R. archesia**
- (Cramer),
- Pap. Exot.*
- III. t. 273. f. F. G.

## GENUS TRIGONODES Guenée.

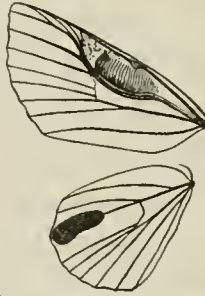
- 246.
- T. cephise**
- (Cramer),
- l.c.*
- III. t. 227. f. C.

## GENUS GRAMMODES Guenée.

- 247.
- G. oculata**
- Snellen,
- Tijl. v. Ent.*
- XXIII. p. 103. t. 8. f. 6.

## GENUS PTEROCHAETA gen. nov.

♂. Antennae simple, filiform, two-thirds the length of the costa; palpi ascending, the third joint produced forward, aciculate; legs with the tibiae more or less hairy,

NEURATION OF *Pterochaeta dohertyi* ♂, 1½.

the hind pair quite densely covered with hair and provided with double spurs at the extremity of the tibiae; the first and second pairs of legs are likewise armed at the end of the tibiae with short spurs. In the primaries vein 4 is emitted a little above the lower outer angle of the cell; vein 5 is nearer vein 4 than vein 6; the costal vein is greatly bent downward toward the inner margin, crowding the cell into a narrow space about the middle of the wing; the precostal follows the normal line of the costal, and between the costal and precostal is included a superior areole considerably larger than the cell, heavily clothed on the underside with erect hair-like scales; the precostal is incrassated about the middle of the costal margin, forming a projection which is bent backwards; veins 11 and 12 are emitted from a common stalk which springs from the costal not far beyond the base and forms the lower margin of the superior areole; veins 6, 7, 8, and 10 spring from a common stalk which arises at the same point as the stalk which supports veins 11 and 12, and follows the course of the latter until it reaches the point where vein 10 is emitted; vein 9 is emitted from vein 8 half way between the outer margin and the origin of vein 10. Hindwing: veins 1 and 1a bifurcate a little beyond the base; vein 5 springs from the lower angle of the cell, which is acutely produced a little above the common origin of veins 3 and 4; the origin of vein 6 is widely distant from the origin of vein 5; vein 6 at its outer extremity is marked by an oblong oval patch of heavy raised scales.

Type: *Pterochaeta dohertyi* Holland.

248. *P. dohertyi* sp. nov.

♂. Palpi black on the upperside, white on the lowerside; head, patagia, and upperside of body pale purplish brown; the underside of the body whitish; legs grey, margined externally with black; tarsi black, ringed with white. The primaries on the upperside are purplish brown, crossed about the middle by a broad pale band, running obliquely from the costa, one-third of its length from the base, to about the middle of the inner margin; beyond this band are a number of brown spots and markings, forming an irregular submarginal series; of these spots those which are just beyond the end of the cell are the largest and most distinct, two of them being pupiled by paler oval centres; at the tip of each nervule on the outer margin is a small pale spot; there are some subapical dark brown spots. The secondaries are

fuscous, marked near the anal angle by transverse spots and strigae. The primaries and secondaries on the underside are pale fuscous. Along the lower edge of the cell of the primaries there are ranged three fascicles of raised hairs, and the cell is profusely clothed with raised scales; beyond the end of the cell are two pale oval marks. The secondaries at the end of the cell have a pale lunate mark margined with dark grey, and there are traces of an interrupted median band of dark brown spots.

Expanse: 35—40 mm.

Described from five *males*.

This insect has been assigned (*in litt.*) to the genus *Thermesia* by Sir George Hampson, who in writing to me adds in his notes the words "subgenus novum." The insect differs structurally from any species of *Thermesia* known to me, and at a glance separates itself from all others by the very peculiar squamulation of the lowerside of the primaries and secondaries and the large tufts of hair projecting from the lower margin of the upper areole. The neururation is also widely different. The facies of the insect is wholly unthermesiid.

#### GENUS THERMESIA Hübner.

##### 249. *T. lichenea* sp. nov.

♂. Body brown on the upperside, pale chestnut brown on the lowerside; legs reddish; tarsi ringed with white. The primaries on the upperside are rich reddish brown, crossed by indistinct median, submedian, and submarginal dark brown bands, accentuated on the interspaces by minute grey dots; at the end of the cell, covering its extremity and extending over the region of the median and radial nervules, is a large, oval, sharply defined, glaucous spot, marked at the origin of vein 5 by a small black dot; above this oval spot are two small triangular spots of the same colour; the apex of the wing and the base are a trifle paler than the rest of the wing, being tinged with ochraceous. The secondaries on the upperside have the anterior half fuscous; the inner half, especially in the region of the anal angle is tinged with rich brown, of the same tint as that of the primaries; a number of minute spots and strigae adorn this portion of the wing. On the underside the wings are fuscous, tinged with reddish ochraceous at the base and on the costae. The primaries are traversed by an indistinct median band, followed by an even less distinct submarginal transverse band. The secondaries have a distinct circular black spot at the end of the cell, the median and submarginal transverse bands being more distinct on this wing than on the primaries.

Expanse: 40 mm.

The type is unique.

##### 250. *T. bolinoides* Guenée, *Noct.* III. p. 358.

##### 251. *T. creberrima* Walker, *Cat. Lep. Hel. B. M.* XV. p. 1574.

#### GENUS ISCHYA Hübner.

##### 252. *I. manlia* (Cramer), *Pap. Erot.* I. t. 92. f. A.

One specimen.

GENUS EPISPARIS Walker.

253. **E. varialis** (Walker), *Cat. Lep. Het. B. M.* XVI. p. 7.

Two examples.

GENUS OXYODES Guenée.

254. **O. scrobiculata** (Fabricius), *Spec. Ins.* II. p. 212.

Four specimens.

GENUS OMMATOPHORA Guenée.

255. **O. luminosa** (Cramer), *l.c.* III. t. 274. f. D.

Four specimens.

GENUS OPHIDERES Boisduval.

256. **O. fullonica** (Linnaeus), *Syst. Nat.* ed. XII. p. 812.

Apparently common.

257. **O. jordani** sp. nov.

♂. Head, collar, and thorax dark brown; abdomen orange, shaded with brown on the upperside just behind the thorax. There are a few brown hairs at the tip of the abdomen; legs brown, shading at the extremities of the tibiae into orange; tarsi dark brown, ringed with white. The primaries on the upperside are dark purplish brown, profusely marked with minute dark brown or blackish points and strigae, uniformly distributed over the entire surface; there are a few greenish scales below the apex; margins crenulate. The posterior wings on the upperside are orange, covered with brown hairs at the base; the outer third as far as vein 2 is marked by a black marginal border; behind this, above the anal angle, is a large sublunate black spot. On the underside the species closely resembles *O. fullonica*.

Expanse: 80—85 mm.

Described from two *males*.

This species is very easily distinguished from all other species of the genus known to me by the almost absolutely uniform colour of the primaries, which appear, unless closely inspected, to be of uniform dark brown, almost black, the minute points and dots being so closely crowded together as to present the appearance of an almost unbroken surface of dark brown.

GENUS ARSACIA Walker.

258. **A. saturatalis** Walker, *Cat. Lep. Het. B. M.* XXXIV. p. 1260.

One specimen.

GENUS PLUSIA Ochsenheimer.

259. **P. eriosoma** Doubleday, Dieffenbach's *New Zealand*, II. p. 285.

One example.

GENUS CALESIA Guenée.

260. **C. dasyptera** (Kollar), Hügel's *Kaschmir*. IV. p. 476

Three *males* and two *females*.



## GENUS MECODINA Guenée.

261. *M. praecipua* (Walker), *Cat. Lep. Het. B. M.* XXXIII. p. 1056.

Three examples.

## GENUS ZETHES Rambur.

262. *Z. grisea* sp. nov.

♂. Palpi pale yellowish brown; front whitish; thorax and upperside of abdomen pale wood brown; the underside of the thorax and abdomen white; legs whitish, marked externally by brown dots; tarsi pale brown ringed with white. The primaries and secondaries on the upperside are pale wood brown with an indistinct reniform spot in the cell of the primaries; a pale ochreous line, defined externally and internally by darker brown, runs from the costa of the primaries, near the middle, obliquely outwardly to beyond the end of the cell, and then returns at a sharp angle to the inner margin of the primaries, and is continued as a straight line across the secondaries to the inner angle. Beyond this sharply defined line, near the apex of the primaries and near the outer angle of the secondaries, are some clouded brown markings. Both wings on the underside are pale grey, tinted with ochreous near the base and laved with purplish grey externally. Upon the primaries there are some faint traces of a transverse median and transverse submarginal dark line, and in one specimen a black point at the end of the cell of the primaries.

Expanse: 30—38 mm.

## GENUS MASCA Walker.

263. *M. leucogastralis* (Walker), *l.c.* XXXIV. p. 1508.

## GENUS HYPERLOPHA Hampson.

264. *H. cristifera* (Walker), *l.c.* XXXIII. p. 1071.

## GENUS CAPNODES Guenée.

265. *C. umbrifera* sp. nov.

♂. Palpi brown, marked outwardly with white spots; front, collar, thorax, and upperside of abdomen brown, lowerside of thorax and abdomen whitish; legs pale brown; tarsi dark brown, ringed with white. The primaries on the upperside are dark purplish brown, crossed from the apex to the middle of the inner margin by a dark brown line darker than the ground colour. This dark brown line is continued across the secondaries to the middle of the inner margin, being interrupted only on the costa. The apex of the primaries below this dark brown line and as far as vein 4 is ochreous. The secondaries beyond the dark brown transverse line are pale ochreous, marked near the inner angle by some dark brown shades; there are also a few obscure submarginal spots and lines; the fringes are brown checkered with paler brown. Both primaries and secondaries on the underside are pale yellowish fuscous, traversed by an obscure median and limbal transverse line and marked at the end of the cell by an obscure brown oval spot.

Expanse: 32 mm.

Type unique.

## GENUS RAPARNA Moore.

266. *R. palpalis* (Walker), *l.c.* XXXIV. p. 1180.267. *R. costiplaga* sp. nov.

♂. Palpi, head, and collar dark brown, the upperside of the thorax and the abdomen of the same colour as the wings; the abdomen at the extremity has some whitish hairs; on the underside the thorax and abdomen are a little paler; legs concolorous. The primaries and the secondaries on the upperside are dark purplish grey, with a few minute pale dots and lines, suggesting a transverse median and submarginal series. On the costa of the primaries, beyond the end of the cell and also at the apex, are black subtriangular spots. On the underside both wings are fuscous, and both are marked in the cell by two minute white spots defined on both sides by blackish lines.

Expanse : 25 mm.

This species appears to be quite common.

## GENUS ADRAPSA Walker.

268. *A. ereboides* Walker, *Journ. Linn. Soc. Zool.* VII. p. 196.269. *A. scopigera* (Moore), *Lep. Ceyl.* III. p. 195. t. 172. f. 9.270. *A. manifestalis* (Walker), *Cat. Lep. Het. B. M.* XVI. p. 171.271. *A. albapicata* sp. nov.

♂. Palpi, head, and collar blackish; upperside of thorax brown sprinkled with grey; upperside of abdomen blackish, abdomen on the lowerside pale brown; there are some whitish hairs at the tip of the abdomen; legs brown, marked with white lines at the joints. The primaries and secondaries on the upperside are dark brown; there is a fine whitish curved basal line and a small white spot beyond it in the cell and a large oval white spot at the end of the cell; beyond the cell is a curved and zigzag fine whitish line, followed by a similar submarginal line, most distinct at the apex; between this submarginal line and the margin below the apex is a large irregular white spot, succeeded by four small marginal points; the fringes are brown, of the same colour as the body of the wing, checkered with white, the spots of the fringe being most conspicuous in immediate proximity to the large white subapical spot. The secondaries are crossed by zigzag median and submarginal lines; there are traces of a zigzag marginal line between veins 4 and 5; the fringes of the secondaries are checkered like the fringes of the primaries, but less conspicuously. On the underside both wings are greyish, the light spots and markings of the upperside reappear on this side with the exception of the large white spot at the end of the cell of the primaries, which is not indicated. All these light transverse lines on the underside are defined internally by dark brown shades. The *female* is like the *male*, but somewhat paler.

Expanse : 40 mm.

272. *A. albibasalis* sp. nov.

♀. The body of this species is like that of the preceding species. The primaries on the upperside are dark brown, with some obscure lighter transverse lines; the base is broadly chalky white, and there is a small subtriangular chalky white spot at the apex. The secondaries on the upperside are uniformly pale fuscous. On the

underside both wings are dark fuscous without any lines or markings whatever. The fringes of both primaries and secondaries are uniformly dark brown.

Expanse : 34 mm.

Unfortunately, there are only two *female* specimens of this species.

273. *A. scotosa* sp. nov.

♂. Antennae, palpi, legs and body and all its appendages wood brown, with a few whitish hairs at the tip of the abdomen. The primaries on the upperside are wood brown, marked with curved basal and median dark brown lines between which, in the middle of the cell, is a minute white point margined by dark brown; there is a very irregular submarginal pale transverse line, shaded internally by dark brown. This dark submarginal shading on the primaries is continued across the secondaries as a straight transverse median band, gradually widening to the middle of the inner margin of the hindwing. The irregular submarginal light line of the primaries is repeated on the secondaries, diverging from the brown shade which follows it on the primaries, and running nearly parallel to the outer margin of the secondaries to the inner angle. The fringes of both primaries and secondaries are dark brown. On the underside both wings are fuscous. Both primaries and secondaries on this side are crossed by a moderately broad median brown band, and both have the pale zigzag submarginal line of the upperside faintly repeated upon the lowerside. There is a black discocellular point at the end of the cell of the secondaries. The *female* is like the *male*.

Expanse : 30 mm.

Described from two specimens.

274. *A. speculifera* sp. nov.

♂. Palpi with the first joint black, the second and third white; front white; eyes black; collar, patagia, and upperside of thorax and abdomen dark brown; the underside of the thorax and abdomen, together with the legs on the lowerside, brilliantly white; tarsi pale brown. The primaries on the upperside are wood brown, with a lunate white spot at the end of the cell and two minute white spots on the costa, one a little beyond its middle and the other near the apex; there are faint traces of darker transverse median and submarginal lines. The secondaries have the costal margin whitish, the remainder of the wing of the same colour as the primaries, traversed by distinct transverse median and submarginal dark lines. On the underside both wings are white at the base, shading outwardly into fuscous. Both the primaries and the secondaries have distinct black spots on the cell, and both are traversed by faint median and very distinct submedian dark brown transverse lines.

Expanse : 27 mm.

GENUS PSEUDAGLOSSA Grote.

275. *P. fulvipicta* Butler, III. *Het. B. M.* VII. p. 87. t. 134. f. 5.

276. *P. antipodalis* sp. nov.

♂. The entire body, the legs, and the antennae fuscous. The primaries on the upperside are dark fuscous, with distinct subbasal and median transverse lines of dark brown, the median line thrice curved, and defined outwardly by a pale whitish

line; the marginal area is traversed by an irregular submarginal band sharply defined externally but melting into the ground colour internally; the fringes are dark fuscous checkered with white. The secondaries on the upperside are uniformly pale fuscous. On the underside the primaries and secondaries are pale fuscous; there is an indistinct subapical whitish line on the costa of the primaries, a linear transverse whitish line at the end of the cell in the secondaries, and following this a well-defined curved transverse median dark line, defined externally by a paler line.

Expanse: 26 mm.

277. *P. (?) buruensis* sp. nov.

♂. The body, the legs, and the antennae are pale wood brown; the eyes darker brown. The primaries on the upperside are wood brown, with an obscure darker brown circular dot in the cell and a somewhat larger oval spot at the end of the cell ringed by pale brown lighter than the ground colour of the wing. There is a fine, irregular, submarginal light line, clouded inwardly with darker brown; beyond this light submarginal line the wing is very pale wood brown, several shades lighter than the ground colour of the remainder of the wing. The secondaries on the upperside are pale wood brown, lighter than the primaries, with a small dark spot at the end of the cell, and traces of obscure curved transverse median and transverse submarginal lines. On the underside the wings are pale grey, the primaries without markings; the secondaries at the base on the cell and near the inner margin have two tufts of coal black hairs extending a short distance in the direction of the outer margin; beyond the black tuft on the cell is a minute black spot at its end, beyond this a well-defined curved median and curved submarginal band.

Expanse: 25—27 mm.

Described from two *male* specimens.

This species is readily distinguished from all others by the little fascicles of jet black hair near the base of the underside of the secondaries.

GENUS BLEPTINA Guenée.

278. *B. nigella* (Swinhoe), *Trans. Ent. Soc. Lond.* p. 265 (1890).

GENUS HYDRILLODES Guenée.

279. *H. abavalis* (Walker), *Cat. Lep. Het. B. M.* XVI. p. 196.

GENUS NODARIA Guenée.

280. *N. tacta* sp. nov.

♂. Front white; head, thorax, and abdomen wood brown, both on the upper side and underside; legs concolorous. Primaries on the upperside reddish fuscous, traversed by two very irregular fine dark brown lines running obliquely from the costa outwardly to the median vein about the middle of the wing, and then returning obliquely towards the middle of the inner margin, being sharply crenulated; between these two lines on the costa is a dark brown shade, limited before and behind by these lines, and accentuated on either side by a pale light yellowish line; beyond these lines near the margin it is a very fine waved light submarginal line, clouded on the inner side by dark brown. The secondaries on the upperside are pale fulvous, marked by a straight transverse dark line running from the inner margin just above the anal



angle toward the middle of the wing, where it disappears; succeeding this outwardly along the outer margin is a pale submarginal light line similar to that upon the primaries. On the underside both wings are fuscous, the primaries lighter on the inner margin; both are crossed by narrow and somewhat indistinct curved median and curved submarginal transverse lines. On the primaries the median transverse line is accentuated near the costa by a white line defining it outwardly for a short distance. The curved transverse submarginal lines of both wings are defined outwardly by a very fine white line. The *female* is like the *male*.

Expanse: 18—20 mm.

Described from twenty-five specimens, none of them in absolutely perfect condition.

The species appears to be common.

#### 281. *N. clathrata* sp. nov.

♂. The entire body, the antennae, and legs are grey. The primaries on the upperside are pale greyish brown, marked by a straight transverse subbasal, somewhat narrow, dark line; there is a small dark brown spot at the end of the cell; following this is a transverse median brown line, produced in a sharp angle beyond the end of the cell, otherwise straight, and parallel for the latter half of its length to the subbasal line; from the apex to near the inner angle is a fine dark brown line, slightly curved inwardly toward the base. The secondaries on the upperside have a faint trace of a prolongation of the transverse median line of the primaries, and the transverse submarginal line of the primaries is projected across the secondaries, making a sharp angle on the outer margin after its middle, and returning toward the anal angle, vanishing before it reaches it. On the underside both wings are much paler, with the spots and transverse lines of the upperside very faintly indicated. The female is very much like the male, but darker in the specimen before me, and with all the spots and lines somewhat more clearly defined, both on the upperside and underside.

Expanse: ♂, 23 mm.; ♀, 26 mm.

#### 282. *N. rugosa* sp. nov.

♂. Palpi, head, upperside of thorax dark brown; abdomen and legs pale fuscous. The primaries on the upperside are dark brown, with a small white point at the end of the cell, beyond which is a mass of raised dark brown scales; there is a faint, pale submarginal transverse line formed by the coalescence of semilunate pale lines, of which the two uppermost, nearest the costa, are white and conspicuous; the fringes are dark brown lightly checkered with pale fuscous. On the upperside the hind wings are uniformly greyish fuscous, the fringes uniformly dark brown. Both wings on the underside are uniformly fuscous without any markings.

Expanse: 33 mm.

Type: unique.

#### GENUS CATADA Walker.

283. *C. vagalis* (Walker), *Cat. Lep. Het. B. M.* XVI. p. 172.

#### GENUS MARAPANA Moore.

284. *M. plagifera* (Walker), *Journ. Linn. Soc., Zool.* VII. p. 187.

285. *M. ilatana* sp. nov.

Head, thorax, and abdomen luteous; legs concolorous. The primaries on the upperside are pale reddish fuscous, slightly clouded with brown at the base, marked with two spots composed of raised dark brown scales at the end of the cell; there is a transverse subbasal straight brown line running from the costa to the inner margin; beyond the cell, running obliquely from the costa just before the apex to the inner margin about the middle is a dark brown shade, gradually broadening from the costa to vein 1, where it terminates in a fine line which runs outwardly to the inner margin; externally this shade is defined by a pale yellowish line. A fine yellowish line runs from the apex to the inner angle, being defined outwardly by a dark brown line. The fringes are brown, checkered between the nervules by pale fuscous. The secondaries on the upperside are pale reddish fuscous, slightly darker on the outer third. On the underside the primaries are pale reddish fuscous, slightly laved with yellow about the apex. The secondaries on the underside are pale grey laved with pale reddish brown on the costa, with a small black dot at the end of the cell and traces of an incomplete curved transverse median band of brown.

Expanse: 20 mm.

Described from two specimens, in one of which the markings on the upperside of the primaries are less clearly defined than in the other.

## GENUS HYPENA Schrank.

286. *H. gonospilalis* (Walker), *l.c.* XXXIV. p. 1516.

287. *H. obstupidalis* (Swinhoe), *Proc. Zool. Soc. Lond.* p. 471. t. 28. f. 7 (1885).

288. *H. indicatalis* (Walker), *l.c.* XVI. p. 61.

289. *H. albifascialis* (Pagenstecher), *Jahrb. Nass. Ver. Nat.* XXXVII. p. 97.

290. *H.* sp. (?).

Several specimens of a species which I think is new to science, but which, without more and better material, I hesitate to describe.

## BRONTYPENA gen. nov.

First joint of palpi short; second joint elongated, subtriangular; third joint greatly produced, elongated, subtriangular; palpi compressed, projecting beyond the head, longer than the abdomen; antennae simple; the hind legs armed with double spurs on the middle and at the end of the tibiae; second pair of legs armed with a long spur at the end of the tibiae. The primaries with the termen and inner margin evenly rounded; vein 5 nearer vein 4 than vein 6; a small areole above the end of the cell; veins 8, 9, and 10 arising from a common stalk, which, together with vein 7, springs from the outer extremity of the areole; vein 11 arising from the upper outer margin of the areole between vein 12 and the origin of vein 7. Hindwing with the cell open, or closed with defective discocellular veinlets running from a little beyond the origin of vein 8 obliquely outwardly to the origin of vein 3 and 4.

Type: *Brontypena eximia* Pagenstecher.

291. *B. eximia* (Pagenstecher), *Iris*, p. 44. t. 3. f. 8. (1886).

FAMILY URANIIDAE.

GENUS NYCTALEMON Dalman.

292. **N. patroclus** (Linnaeus), *Syst. Nat.* p. 462 (1758).

GENUS ALCIDIS Hübner.

293. **A. orontes** (Clerck), *Icon. Ins.* t. 26. f. 1.

GENUS URAPTEROIDES Moore.

294. **U. astheniata** (Guenée), *Phal.* II. p. 24.

GENUS ACROPTERIS Hübner.

295. **A. striataria** (Clerck), *Icon. Ins.* t. 55. f. 4.  
296. **A. obliquaria** (Moore), *Proc. Zool. Soc. Lond.* p. 622. t. 60. f. 17. (1877).

GENUS PSEUDOMICRONIA Moore.

297. **P. advocataria** (Walker), *Cat. Lep. Het. B. M.* XXIII. p. 822.

GENUS MICRONIA Guenée.

298. **M. aculeata** (Guenée), *Phal.* II. p. 26. t. 13. f. 8.

FAMILY EPIPLEMIDAE.

GENUS EPIPLEMA Herrich-Schäffer.

299. **E. quadricaudata** (Walker), *l.c.* XXIII. p. 847.  
300. **E. rhagavata** (id.), *l.c.* p. 848.  
301. **E. conflictaria** (id.), *l.c.* p. 851.  
302. **E. instabilata** (id.), *l.c.* XXXV. p. 1646.  
303. **E. nivosaria** (id.), *l.c.* p. 1644.  
304. **E. lacteata** sp. nov.

♂. Eyes black, antennae fuscous, thorax light brown, abdomen grey, legs creamy. Primaries snow white, with a small black dot at the end of the cell, a larger black spot between veins 4 and 5 beyond the cell on the limbal space, and a similar spot just above vein 1, a little beyond the middle of the inner margin; there are a few faint geminate marginal lines on the interspaces, most conspicuous near the inner angle, and three minute black dots on the outer margin just below the apex. The secondaries on the upperside have a moderately large and conspicuous black spot at the end of the cell; a narrow curved brownish line runs from the middle of the costa toward the outer margin, terminating between veins 2 and 3; a pale curved line runs from beyond the middle of the inner margin, joining the other line at the point where it terminates; a similar faint brown line runs from the costa near the outer angle to the same point, and is joined by a geminate pale brown line running from the inner angle to the same point; at this point there is a conspicuous

black spot; the fringes are whitish, defined inwardly, above the point where the various lines coalesce, by pale, dark brown lunulate marginal markings. On the underside both wings are pure white without markings.

Expanse: 25 mm.

Type: unique.

305. *E. buruana* sp. nov.

♂. The eyes are black; body, abdomen, and legs pale grey. The primaries are grey, with a minute black dot about the middle of the cell, and a larger, somewhat diffused brownish dot at the end of the cell; above the latter spot, toward the costa, are three minute black points; the costa near the apex is touched with three black dots, and the outer margin, below the subfalcate apex, is ornamented with four black dots; the fringes are dark brown on the outer margin. The secondaries are darker grey, with small points of dark brown in the cell and a larger dark brown spot at the end of the cell; a dark brown band runs from the inner margin near the anal angle to the middle of the wing, where it bends outwardly to the outer margin, and then ascending as a double brown line, extends to the upper angle of the wing; this band is defined outwardly by a narrow white line; the fringes on the inner half of the outer margin are white, defined inwardly by a fine black line, and on the upper half of the outer margin the fringes are dark brown. On the underside the primaries are dark grey with the costa and the outer margin pale luteous. The secondaries are whitish, with a small black dot at the end of the cell and a moderately broad transverse submarginal grey shade extending from the costa as far as the middle of the wing, and then terminating.

Expanse: 17 mm.

Type: unique.

FAMILY GEOMETRIDAE.

GENUS URAPTERYX.

306. *U. geminia* (Cramer), *Pap. Exot.* t. 133. f. C.

GENUS NADAGARA Walker.

307. *N. obrussata* sp. nov.

Eyes black; thorax pale ochreous; abdomen greyish fuscous on the upperside; the thorax and abdomen paler on the underside; legs stramineous. The primaries on the upperside are pale ochraceous, with three equidistant pale brown markings on the costa; parallel to the outer margin, extending from the inner margin beyond its middle to the middle of the wing, is a dark brown clouded spot, somewhat constricted about its middle; above it two smaller brown spots. The secondaries on the upperside are coloured like the primaries, and from the inner margin above the anal angle, toward the middle of the wing, extends a clouded brown spot, repeating on this wing the pattern of the primaries. Both wings on the underside are very pale luteous, with the dark brown spots of the upperside faintly reappearing.

Expanse; 34 mm.

Type: unique.

GENUS LUXIARIA Walker.

308. *L. exclusa* (Walker), *Cat. Lep. Het. B. M.* XXI. p. 320.



309. *L. euchlorata* sp. nov.

♂. Eyes black, vertex white, upperside of thorax and abdomen greyish brown; underside of thorax and abdomen paler; legs grey. The basal third of both wings on the upperside is greyish brown, traversed by some wavy lines; following this is a broad white band, entirely crossing the secondaries, but lost on the primaries, near the costa, in grey cloudings, which completely cover the costa of this wing. Following this white band outwardly is a crenulate dark brown line, followed immediately by a parallel crenulate white line; this white line is followed outwardly by a greyish brown shade which covers the entire outer margin of both wings, being interrupted on the margin by a series of pale whitish lunules defined outwardly by darker brown lunules. On the underside the primaries have the costal area and the outer third greyish brown, irrorated with minute brownish transverse striae; the white band of the upperside reappears below, defined outwardly and inwardly by heavy dark lines; the apex of the wing is white. The secondaries are white from the base as far as the outer third, which is dark brown; a narrow subbasal brown line extends from the costa to the inner margin, and the outer margin and the anal angle are somewhat broadly whitish.

Expanse: 27 mm.

Type: unique.

GENUS *MACARIA* Curtis.

310. *M. perfusaria* Walker, *Cat. Lep. Het. B.M.* XXXV. p. 1659.

311. *M. albapicaria* sp. nov.

♂. Front brown; vertex whitish; eyes black; upperside of thorax and abdomen iron grey; underside of thorax and abdomen whitish; legs grey. Both wings on the upperside have the inner half reddish grey, profusely marked with minute spots of darker brown and crossed by subbasal and submedian narrow brown lines; beyond the outer half is a very sharply defined and quite regular dark brown line, running from the costa of the primaries to about the middle of the inner margin of the secondaries; beyond this the wings are solidly and uniformly dark purplish grey, except as they are marked near the outer margin by a few pale, indistinct light grey submarginal spots, and at the apex of the primaries have two chalky white confluent spots. On the underside the wings have the inner half profusely mottled with dark brown and white spots, the costa of the primaries being almost clear white; the outer half of both wings is dark reddish grey, with the margins and the apex reproducing more distinctly than on the upper surface the whitish marginal spots.

Expanse: 23 mm.

Type: unique.

GENUS *HYPOSIDRA* Guenée.

312. *H. talaca* (Walker), *Cat. Lep. Het. B. M.* XX. p. 59.

GENUS *HYPEPHYRA* Butler.

313. *H. subfasciata* (Warren), *Nov. Zool.* III. p. 143 (1896).

GENUS *PSAMATODES* Guenée.

314. *P. nunctata* Felder & Rogenhofer, *Novara Reise, Lep.* t. 129. f. 20.

GENUS AMBLYCHIA Guenée.

315. **A. angeronaria** Guenée, *Phal.* I. p. 215. t. 4. f. 9.  
316. **A. tetragonata** (Walker), *Cat. Lep. Het. B. M.* XXVI. p. 1651.

GENUS BOARMIA Treitschke.

317. **B. acaciaria** Boisduval, *Faun. Ent. Madag. Lep.* 116. t. 16. f. 4.  
318. **B. detractaria** Walker, *l.c.* XXI. p. 385.  
319. **B. sublavaria** Guenée, *Phal.* I. p. 256.  
320. **B. concentraria** Snellen, *Tijd. v. Ent.* XX. p. 40. t. 3. f. 20.  
321. **B. bhurmitra** Walker, *l.c.* p. 381.

GENUS ABRAXAS Leach.

322. **A. hypsata** Felder & Rogenhofer, *Novara Reise, Lep.* t. 130. f. 16.

GENUS MILIONIA Walker.

323. **M. glauca** (Stoll), in *Cram. Pap. Exot.* IV. p. 152. t. 368. f. D.

GENUS CRASPEDOSIS Butler.

324. **C. sobria** Walker, *l.c.* XXXI. p. 164.

GENUS BRACCA Hübner.

325. **B. bajularia** (Clerck), *Icon. Ins.* t. 54. f. 6 7.

GENUS EUMELEA Duncan.

326. **E. rosalia** (Stoll), in *Cram. Pap. Exot.* IV. t. 368. f. F.  
327. **E. eugeniata** Guenée, *Phal.* II. p. 394.

GENUS NOREIA Walker.

328. **N. perdensata** Walker, *Cat. Lep. Het. B. M.* XXIV. p. 1092.

GENUS RAMBARA Moore.

329. **R. luminaria** (Hübner), *Zutr. Exot. Schmett.* IV. p. 35. ff. 757. 758.

GENUS OZOLA Walker.

330. **O. productata** Zeller.  
331. **O. macariata** (Walker), *Cat. Lep. Het. B. M.* XXVI. p. 1637.

GENUS PHIBALAPTERYX Stephens.

332. **P. ghosha** (Walker), *l.c.* XXIV. p. 1249.

GENUS SAURIS Guenée.

333. **S. eupitheciata** Snellen, *Tijd. v. Ent.* XXIV. p. 94. t. 10. f. 7. 8.

GENUS CRASPEDIA Hübner.

334. **C. perlineata** (Walker), *l.c.* XXIII. p. 775.  
335. **C. remotata** (Guenée), *Phal.* I. p. 458.  
336. **C. actuaria** (Walker), *l.c.* XXII. p. 752.  
337. **C. crossophragma** Meyrick, *Trans. Ent. Soc. Lond.* p. 206 (1886).

GENUS ANISODES Guenée.

338. **A. argentispila** Warren, *P. Z. S. Lond.* p. 361 (1893).

GENUS TIMANDRA Duponchel.

339. **T. aventiaria** Guenée, *Phal.* II. p. 3.

GENUS PSEUDOTERPNA Hübner.

340. **P. ruginaria** (Guenée), *l.c.* p. 278.  
341. **P. chlora** (Stoll), in *Cram. Pap. Exot.* IV. t. 398. f. C.

GENUS HEMITHEA Duponchel.

342. **H. tritonaria** (Walker), *Cat. Lep. Het. B. M.* XXVI. p. 1560.

GENUS THALASSODES Guenée.

343. **Thalassodes avicularia** (Guenée), *Phal.* I. p. 342.

GENUS THALERA Hübner.

344. **Thalera** sp. ?

A single damaged specimen, too poor to determine.

FAMILY PYRALIDAE.

GENUS HARPAGONEURA Butler.

345. **H. complana** (Felder & Rogenhofer), *Novara Reise, Lep.* t. 137. f. 6.

GENUS MELISSOBLAPTES Zeller.

346. **M. burellus** sp. nov.

♂. Body throughout grey, legs whitish, eyes black. The primaries on the upper side are grey, marked with two small black points, succeeding each other toward the end of the cell, and one small black point near vein 3 at its origin; on the costa just before the apex is a brown mark shaped like the figure 2. The fringes are pale grey, checkered with darker grey. The secondaries on the upper side are pale ashen grey, slightly darker at the outer angle; fringes concolorous. On the under side both wings are lustrous grey, shaded by a darker tint about the middle.

Expanse: 27 mm.

GENUS CRAMBUS Fabricius.

347. **C. malacellus** Duponchel, *Lép. France* X. p. 61. t. 270. f. 5.

GENUS ESCHATA Walker.

348. **E. chrysargyria** (Walker), *Cat. Lep. Het. B. M.* XXXII. p. 634.

GENUS CIRRHOCRISTA Lederer.

349. **C. mnesidora** (Meyrick), *Trans. Ent. Soc. Lond.* p. 475 (1894).  
350. **C. punctulata** Hampson, *Proc. Zool. Soc. Lond.* p. 919 (1895).  
351. **C. pulchellalis** Lederer, *Wien. Ent. Monats.* VII. p. 441. t. 17.  
f. 10 (1863).  
352. **C. aetherialis** *id.*, *l.c.* f. 9.

GENUS EMMALOCERA Ragonot.

353. **E. leucocincta** (Walker), *l.c.* p. 169.

GENUS HOMOEOSOMA Curtis.

354. **H. cataphaea** (Meyrick), *Trans. Ent. Soc. Lond.* p. 88 (1897).

GENUS HYPHANTIDIUM Scott.

355. **H. albicostale** (Walker), *l.c.* XXVII. p. 80.

GENUS ETIELLA Zeller.

356. **E. zinckenella** (Treitschke), *Schmett. Eur.* IX. 1. p. 201.

GENUS CURICTA Walker.

357. **C. lutealis** (Snellen), *Tijd. v. Ent.* XXXVII. p. 75. t. 3. f. 7. 8.

GENUS ENDOTRICA Zeller.

358. **E. buralis** sp. nov.

♂. Palpi yellowish, eyes brown, collar and upperside of thorax brown; upperside of abdomen pale rufous; pectus and anterior legs brown; lowerside of abdomen pale yellowish. The primaries and secondaries are plumbeous at the base, each crossed by a waxy yellow transverse band from the costa to the inner margin; this band is constricted about its middle on the primaries, and broadens on the secondaries as it approaches the inner margin. The outer third of the primaries and the upper portion of the outer third of the secondaries are rosy. On the costa of the primaries just before the apex is a small subtriangular yellowish spot. The markings on the upperside of the wings are repeated upon the lowerside, but more diffused and paler.

Expanse: 17 mm.

GENUS COTACHENA Moore.

359. **C. histricalis** (Walker), *Cat. Lep. Het. B. M.* XVIII. p. 655.

GENUS VITESSA Moore.

360. **V. sarumensis** sp. nov.

♂. Palpi black, marked with yellowish on the sides; front bright orange; vertex orange; collar black; patagia black, striped on both sides with orange yellow; there



is a small triangular white spot on the thorax just before the abdomen ; the abdomen black, each segment lightly margined with pale grey ; a bunch of orange yellow hairs at the anal extremity ; legs grey, the last pair having the femur margined with white and the ends of the tibiae whitish. The primaries on the upperside are black, showing a bluish green iridescence in certain lights ; at the base are three orange yellow spots succeeded between veins 1 and 2 by two equidistant subtriangular white spots with their apices pointing toward each other ; above the outermost of these spots is a large round white spot, and beyond these two spots the outer margin has the course of the nervules defined by fine white lines, which show conspicuously upon the darker ground. The secondaries on the upperside are black, with a large irregular oval white spot filling the middle of the wing. On the lowerside the primaries are blackish, the large round spot at the end of the cell and the subtriangular spot below it, between veins 1 and 2, being reproduced, but less sharply defined. There are some white rays near the apex. The secondaries on the underside are as on the upperside, but in addition the nervules near the outer angle are margined with white. The fringes on the secondaries are whitish near the outer angle. The fringes of the primaries are black. The *female* quite like the *male*.

Expanse : 37—43 mm.

Described from five specimens.

This species somewhat resembles *Vitessa tomatoca* Lederer, but is manifestly distinct.

#### GENUS HERCULIA Walker.

361. *H. nigrivitta* (Walker), *l.c.* p. 125.

#### GENUS SACADA Walker.

362. *S. rubralis* sp. nov.

♀. This insect is uniformly rosy red, paler on the hindwings than on the forewings. The primaries have a fine white line closing the end of the cell, followed by a transverse discal fine white line running at right angles from the costa as far as vein 5, and then making an obtuse angle, running parallel to the outer margin to the inner margin, which it reaches a little beyond its middle. On the underside both wings are a trifle paler than in the upperside, and only the white mark at the end of the cell of the primaries and the costal portion of the transverse limbal line are faintly indicated.

Expanse : 38 mm.

#### GENUS NYMPHULA Schrank.

363. *N. seriopunctalis* Hampson, *Trans. Ent. Soc. Lond.* p. 144 (1897).

#### GENUS AMBIA Walker.

364. *A. interstrigalis* Hampson, *l.c.* XVIII. p. 162.

#### GENUS AULACODES Guenée.

365. *A. basilissa* Meyrick, *Trans. Ent. Soc. Lond.* p. 474 (1894).

GENUS ORPHNOPHANES Lederer.

366. **O. thoasalis** (Walker), *l.c.* p. 692.

GENUS PERISYNTROCHA Meyrick.

367. **P. anialis** (Walker), *l.c.* p. 710

GENUS DRACAENURA Meyrick.

368. **D. horochroa** Meyrick, *Trans. Ent. Soc. Lond.* p. 229 (1886).

GENUS HYMENOPTYCHIS Zeller.

369. **H. sordida** Zeller, *Lep. Caffr.* p. 65.

GENUS TATOBOTYS Butler.

370. (?) **T. albovenalis** Hampson.

"Like two *females* from Ceylon. I am not sure that they are this species, or a dark form of *picrogramma* Meyrick." Hampson *in litt.*

371. **T. aurantialis** Hampson, *Trans. Ent. Soc. Lond.* p. 197 (1897).

GENUS BRADINA Lederer.

372. **B. impressalis** Lederer, *Wien. Ent. Monats.* VII. p. 425. t. 15. f. 16. (1863).

373. **B. selectalis** *id.*, *l.c.* t. 16. f. 1.

374. **B. modestalis** *id.*, *l.c.* p. 426. t. 16. f. 3;

GENUS DIATHRAUSTA Lederer.

375. **D. profundalis** *id.*, *l.c.* p. 438. t. 17. f. 7.

GENUS STENIA Guenée.

376. **S. spodinopha** (Meyrick), *Trans. Ent. Soc. Lond.* p. 469. (1895).

GENUS PILETOCERA Lederer.

377. **P. nigrescens** (Butler), *Trans. Ent. Soc. Lond.* p. 424 (1886).

378. **P. reducta** (Walker), *Cat. Lep. Het. B. M.* XXXIV. p. 1296.

379. **P. aegimiusalis** (Walker), *l.c.* XIX. p. 929.

GENUS SCOPARIA Haworth.

380. **S. sp.** (?).

GENUS ENTEPHRIA Lederer.

381. **E. jaguaralis** (Guenée), *Delt. & Pyral.* p. 283.

382. **E. meritalis** (Walker), *l.c.* XVII. p. 479.

383. **E. sarumalis** sp. nov.

♂. Palpi whitish, tipped with black, front and vertex grey; upperside of abdomen whitish, with the anal extremity narrowly marked with black at the base of the anal tuft of white hairs; the underside of the thorax, abdomen, and legs is white. The wings on the upperside are shining white, crossed by a subbasal transverse brown line; at the end of the cell is a pale linear brown line, below it a similar brown line, and just beyond the latter, on the inner margin about its outer third, a well-defined black point; a narrow brown line runs from the costa before the apex toward the inner angle, which it does not quite reach. The secondaries on the upperside are traversed by an irregularly curved narrow pale brown median transverse line. The fringes of both wings are white. On the underside the wings are whitish, tinged outwardly with pale ochraceous, the markings of the underside being very faintly repeated.

Expanse: 21 mm.

GENUS RAVANOA Moore.

384. **R. xiphialis** (Walker), *Cat. Lep. Het. B. M.* XVII. p. 483.

GENUS ZINCKENIA Zeller.

385. **Z. perspectalis** (Hübner), *Europ. Schmett. Pyr.* f. 101.

386. **Z. fascialis** (Stoll), in *Cram. Pap. Exot.* IV. t. 398. f. O.

GENUS TABIDIA Snellen.

387. **T. insanalis** Snellen, *Tijd. v. Ent.* p. 220 (1880); *id., l.c.* t. 8. f. 6 (1883).

GENUS EURRHYPARODES Snellen.

388. **E. bracteolalis** Zeller, *Lep. Caffr.* p. 30.

GENUS RHIMPHALEA Lederer.

389. **R. scelatalis** Lederer, *Wiener Ent. Monats.* VII. p. 411, t. 15. f. 3 (1863).

GENUS SYNGAMIA Guenée.

390. **S. ampliatalis** Lederer, *l.c.* p. 428. t. 16. f. 6.

GENUS BOCCHORIS Moore.

391. **B. adipalis** Lederer, *l.c.* p. 475. t. 11. f. 16.

392. (?) **B. aptalis** (Walker), *Cat. Lep. Het. B. M.* XXXIV. p. 1425.

I am not quite sure of my identification.

393. *B. lumaralis* sp. nov.

♂. Palpi in front white, eyes black, vertex white; upperside of thorax fuscous; two anterior segments of abdomen white; remaining segments pale grey; underside of thorax, abdomen, and legs white. Both wings on the upperside are white, with a lustrous violet reflection. On the primaries there are two small brown spots on the costa near the base; there is a small brown spot in the middle of the cell, and a larger brown spot at the end of the cell; below the first, at the origin of vein 2, between vein 2 and vein 1, is a large subquadrate brown spot, and beyond this, not far from the middle of the inner margin and situated thereon, is another large subquadrate brown spot; there is a narrow submarginal transverse brown band running from the costa as far as vein 2, succeeded by a very narrow whitish series of lunules: this series of lunulate spots is succeeded by a broad dark brown marginal band of uniform width; the fringes are white, checkered at the ends of the nervules with dark brown. The secondaries have two dark brown spots at the base and a large dark brown spot at the end of the cell; there is a curved submarginal dark brown band, broadening on the costa and on the inner margin, succeeded by a narrow light line of lunulate markings on the primaries, and this again succeeded, as on the primaries, by a broad dark brown marginal band; the fringes are white, checkered with dark brown less conspicuously than on the primaries. On the underside both wings are pale grey, with the costae broadly pale ochraceous; the outer margin and apex of the primaries are also lightly laved with pale ochraceous; the spots and markings of the upperside reappear on the lowerside, but much less distinct, and quite diffuse, the spots on the cell of the primaries and the submarginal band being most conspicuous, and even heavier than on the upperside.

Expanse: 24 mm.

## GENUS NOSOPHORA Lederer.

394. *N. althealis* (Walker), *Cat. Lep. Hct. B. M.* XVIII. p. 697.  
 395. *N. flavibasalis* Hampson, *P. Zool. Soc. Lond.* p. 663. t. 50. f. 3 (1898).

## GENUS CHALCIDOPTERA Butler.

396. *C. emissalis* (Walker), *l.c.*, XXXIV. p. 1421.

## GENUS PHRYGANODES Guenée.

397. *P. basalticalis* Lederer, *Wien. Ent. Monats.* VII. p. 407. t. 14. f. 11 (1863).  
 398. *P. albipedalis* Hampson, *Proc. Zool. Soc. Lond.* p. 686 (1898).  
 399. *P. attenuata* *id.*, *l.c.* p. 680.

400. *Phryganodes baratalis* sp. nov.

♂. Palpi and head dark brown; the eyes dark brown; the remainder of the body, the antennae, and the legs are ochraceous. The wings, both on the upperside and underside are uniformly ochraceous, the costa of the primaries being margined with plumbeous from the base almost to the apex. The *female* is in its markings not different from the *male*.

Expanse: *male*, 35 mm.; *female*, 42 mm.

Described from nine specimens.



## GENUS DICHOCROCIS Lederer.

401. **D. tripunctapex** Hampson, *Proc. Zool. Soc. Lond.* p. 691. t. 50. f. 5 (1898).  
 402. **D. pandamalis** (Walker), *Cat. Lep. Het. B. M.* XIX. p. 999.  
 403. **D. surusalis** (Walker), *l.c.* XVIII. p. 695.  
 404. **D. evaxalis** (Walker), *l.c.* XIX. p. 995.

## GENUS NACOLEIA Walker.

405. **N. marionalis** (Walker), *l.c.* XIX. p. 930.  
 406. **N. perdentalis** Hampson, *Proc. Zool. Soc. Lond.* p. 697 (1898).  
 407. **N. cuprealis** (Moore), *ibid.* p. 616. t. 60. f. 13 (1877).

## GENUS GONIORHYNCHUS Hampson.

408. **G. obscurus** Hampson, *l.c.* p. 704.  
 409. **Goniorhynchus gulielmalis** sp. nov.

♂. Palpi, front, and antennae whitish, eyes black, upperside of thorax and abdomen pale grey; lowerside of thorax and abdomen, together with the legs, white. Both wings on the upperside are white, broadly margined externally with plumbeous. The primaries have a dark brown spot at the base near the costa, succeeded by a round brown dot near the base on the inner margin; there is a transverse linear streak and a round dot about the middle of the cell, followed at the end of the cell by a large subquadrate brown spot; below the spots which mark the middle of the cell, between veins 1 and 2, is a subtriangular brown spot, coalescing with a short transverse line running downwardly to the inner margin; there is a transverse limbal line running from the costa to the inner margin, interrupted just below the costa and bowed outwardly like the capital letter "U," beyond the lower outer angle of the cell; the dark brown outer margin of the primaries is relieved by two small white spots at the apex, and by a whitening of the fringes of the outer margin just below the apex. The secondaries on the upperside have a subtriangular dark brown spot at the end of the cell, followed by a transverse median brown band, running from the costa and bending outwardly after vein 2 to the anal angle; this band is succeeded by a somewhat obscure and broken transverse limbal band, coalescing at either extremity with the dark brown marginal shade; the fringes are brown, accentuated with a point of white just at the outer angle and at a point a little below this angle; the fringes become whitish also toward the anal angle. The underside of the wings is much paler and all the markings of the upperside are reproduced, but very faintly and with poor definition.

Expanse: 17 mm.

Type: unique.

## GENUS SYLEPTA Hübner.

410. **S. fabiusalis** (Walker), *Cat. Lep. Het. B. M.* XVIII. p. 715.  
 411. **S. abyssalis** (Snellen), *Tijd. v. Ent.* XXXV. p. 172. t. 10. f. 11. 12.  
 412. **S. balteata** (Fabricius), *Ent. Syst. Suppl.* p. 457.

413. *S. sellalis* (Guenée), *Delt. & Pyr.* p. 330.  
414. *S. sabinusalis* (Walker), *Cat. Lep. Het. B. M.* XVIII. p. 708.  
415. *S. derogata* (Fabricius), *Syst. Ent.* p. 641.  
416. *S. iopasalis* (Walker), *l.c.* p. 652.  
417. *S. dissipitalis* Lederer, *Wien. Ent. Monats.* VII. p. 474. t. 11. f. 13 (1863).  
418. *S. benedictalis* sp. nov.

♀. Head, thorax, and abdomen on the upperside dark brown, antennae brown; lower side of thorax and abdomen pale brown; legs pale brown, the anterior pair marked with white dots on the tibiae. The primaries on the upperside are dark brown, with a purplish lustre; at the end of the cell is a minute oval pearly white spot; beyond the cell, running from the apex to the middle of the inner margin, is a very obscure curved transverse brown line, which is connected with the costa by a short brown line running diagonally outward from the costa two-thirds of its distance from the base until it meets the first line. The secondaries are pale yellowish fuscous, with the outer margin shading into brown. On the underside both wings are uniformly pale yellowish fuscous, slightly clouded with brownish beyond the ends of the cells.

Expanse: 31 mm.

GENUS *LYGROPIA* Lederer.

419. *L. obrinusalis* (Walker), *Cat. Lep. Het. B. M.* XVIII. p. 549.  
420. *L. poltitalis* (Walker), *l.c.* p. 714.  
421. *L. holoxanthalis* sp. nov.

♂. Palpi yellowish, vertex white, antennae pale testaceous; upperside of thorax and abdomen very pale ochraceous; underside of thorax, abdomen, and legs whitish. Both wings on the upperside are uniformly pale ochraceous with a silky lustre; on the underside they are uniformly ochraceous, but without the silky lustre of the upper surface.

Expanse: 25 mm.

GENUS *GLYPHODES* Guenée.

422. *G. vertumnalis* (Guenée), *Delt. & Pyr.* p. 309.  
423. *G. indica* (Saunders), *Trans. Ent. Soc. London* p. 163. t. 12. f. 5. 6. 7. (1851).  
424. *G. suralis* Lederer, *Wien. Ent. Monats.* VII. p. 405. t. 14. f. 7 (1863).  
425. *G. cupripennalis* Hampson, *Moths of India* IV. p. 351.  
426. *G. glauculalis* (Guenée), *Delt. & Pyr.* p. 306.  
427. *G. itysalis* Walker, *Cat. Lep. Het. B. M.* XVII. p. 501.  
428. *G. jovialis* Felder & Rogenhofer, *Novara Reise, Lep.* II. 2. t. 136. f. 25.

GENUS *PYGOSPILA* Guenée.

429. *P. bivittalis* Walker, *l.c.* XXXIV. p. 1365.  
430. *P. tyres* (Cramer), *Pap. Exot.* III. t. 263. f. C.

GENUS LEPYRODES Guenée.

431. **L. geometralis** Guenée, *Delt. & Pyr.* p. 278. t. 8. f. 6.

GENUS ANALYTA Lederer.

432. **A. sigulatis** (Guenée), *Delt. & Pyr.* p. 223.

GENUS SAMEODES Snellen.

433. **S. cancellalis** Zeller, *Lep. Caffr.* p. 34.

GENUS MEROCTENA Lederer.

434. **M. tullalis** (Walker), *l.c.* XVIII. p. 649.

GENUS ARCHERNIS Meyrick.

435. **A. dolopsalis** (Walker), *l.c.* XVIII. p. 692.

GENUS OMPHISA Moore.

436. **O. anastomalis** (Guenée), *Delt. & Pyr.* p. 373.

GENUS HYALOBATHRA Meyrick.

437. **H. illectalis** (Walker), *l.c.* p. 658.

GENUS MARUCA Geyer.

438. **M. testulalis** (Geyer), in Hübner, *Samml. Exot. Schmett.* IV. 4. p. 12.  
f. 629. 630.

GENUS TETRIDIA Warren.

439. **T. caletoralis** (Walker), *l.c.* p. 651.

GENUS POLYGRAMMODES Guenée.

440. **P. purpuralis** (Walker), *l.c.* XXXIV. p. 1482.

GENUS PACHYZANCLA Meyrick.

441. **P. hipponalis** (Walker), *l.c.* XVII. p. 724.

442. **P. dilatipes** (Walker), *l.c.* XXXIV. p. 1419.

GENUS PROOEDEMA Hampson.

443. **P. inscisale** (Walker), *l.c.* XXXIV. p. 1410.

GENUS CALAMOCHROUS Lederer.

444. **C. tranquillalis** Lederer, *Wien. Ent. Monats.* VII. p. 371. t. 9. f. 16 (1863).

GENUS PIONEA Guenée.

445. **P. clavifera** Hampson, *Proc. Zool. Soc. Lond.* p. 241 (1899).

446. **P. aureolalis** Lederer, *l.c.* p. 375.

## GENUS PYRAUSTA Schrank.

447. *P. ceadesalis* (Walker), *l.c.* XVIII. p. 639.448. *P. incoloralis* (Guenée), *Delt. & Pyr.* p. 332.449. *P. salentialis* (Snellen), *Tijd. v. Ent.* p. 207 (1880); *id.*, *l.c.* t. 7. f. 1 (1883).450. *P. cajelalis* sp. nov.

♀. Palpi whitish, margined externally with brown; eyes dark brown; vertex, collar, upperside of thorax and abdomen pale wood brown; pectus white; underside of thorax and abdomen greyish white; legs concolorous. The primaries on the upperside are wood brown, darker towards the base; there are two small equidistant dots on the cell, and a larger ocelliform brown spot at the end of the cell; there is a submarginal series of dark brown sagittate points extending from the costa before the apex in a straight line parallel to the outer margin as far as the space between veins 2 and 3; between veins 1 and 2, nearer the base, and a little beyond the middle of the inner margin, is a similar spot. The secondaries on the upperside are pale testaceous, shaded into wood brown on the outer margin; a submarginal series of points similar to those upon the primaries extends across the limbal area of this wing, and a small black point occurs nearer the base, above the anal angle. On the underside both wings are whitish, tinged with greyish toward the outer margin; the dark spots on the underside are repeated upon the lowerside with greater distinctness.

Expanse: 40 mm.

Type: unique.

## FAMILY TORTRICIDAE.

## GENUS SIMAETHIS Zeller.

451. *S. sp.* (?).

Very near *Simaethis taprobanes* Zeller, *Hor. Soc. Ent. Ross.* XIII. p. 178. t. 2. f. 65, but the lines on the primaries are slightly different in their arrangement.

## FAMILY TINEIDAE.

## GENUS TORTRICOMORPHA Felder.

452. *T. bilineella* Snellen, *Tijd. v. Ent.* p. 27. t. 2. f. 16. 17 (1885).453. *T. hemixanthella* sp. nov.

♂ Palpi orange yellow, vertex whitish; upperside of thorax very pale yellow; upperside of abdomen pale grey, the upper tufts of the anal hairs brown, and the lower tufts white; the underside of thorax, abdomen, and legs whitish. The forewings are broadly pale yellow from the base to beyond the middle, they are then broadly purplish brown; the line of demarcation between the yellow and the brown is sharply defined by a straight line running from the costa to the inner margin a little before the inner angle; the costa near the apex is marked by yellow of the same shade as the basal half of the wing, the yellow widening toward the outer margin and covering the entire apex; the fringes are dark brown, their origin being accentuated by a series of minute yellow dots. The secondaries on the upperside are uniformly dark brown. On the underside both wings are pale brown, slightly lighter



on the inner margin, with traces of an obscure whitish median transverse band on the primaries.

Expanse: 20 mm.

GENUS ADELA Latreille.

454. *A. sp.* (?).

Probably undescribed. Several specimens.

GENUS ATTEVA Walker.

455. *A. basalis* Vollenhoven, *Tijd. v. Ent.* VI. p. 140. t. 9. f. 6.

In addition to the foregoing there are six other small and obscure species which are represented by solitary specimens, and which neither Sir George Hampson nor I have as yet determined. The collection numbers four hundred and sixty-one species, by far the largest number ever received from Buru at one time.

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## ADDITIONS TO THE LIST OF BIRDS OF SOUTHERN ARABIA.

By W. R. OGILVIE-GRANT.

THE following species recorded from Aden were accidentally omitted from the list of birds of South Arabia published in the *NOVITATES ZOOLOGICAE* VII. pp. 243—273.

189. *Buteo vulgaris*.

*Buteo vulgaris* Leach, Yerbury, *J. Bombay Nat. Hist. Soc.* XI. p. 75 (1897).

190. *Casarca rutila*.

*Casarca rutila* (Linn.), Yerbury, *l.c.*, p. 76 (1897).

191. *Mareca penelope*.

*Mareca penelope* (Linn.), Yerbury, *l.c.*, p. 76 (1899).

192. *Fuligula fuligula*.

*Fuligula fuligula* (Linn.), Yerbury, *l.c.*, p. 76 (1897).

193. *Phalaropus hyperboreus*.

*Phalaropus hyperboreus* (Linn.), Blanford, *Faun. Brit. Ind.* IV. p. 282 (1898).

On p. 264, 102. *Pelecanus onocrotalus* should be 102. *Pelecanus rufescens* [see Grant, *Cat. B. Brit. Mus.* XXVI. p. 475. Specimen *i.* (1898)].

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## THE RED FLYING SQUIRREL OF THE NATUNA ISLANDS.

By OLDFIELD THOMAS.

The animal referred by Mr. Hartert and myself in 1895 to "*Pteromys nitidus*, Desm." \* proves on a second examination, and comparison with more material than was formerly available, to be so very much smaller than, and to have so many other differences from the true *Petaurista nitida*, and its ally *P. melanotis*, as to necessitate its having a special name.

***Petaurista nitidula* sp. n.**

Similar in general appearance to *P. nitida*, but considerably smaller. General body colour as in *P. nitida*. Sides of face and tips of ears whitish, contrasting with the rufous crown, and blackish whisker spots, eye-rings and postauricular patches. Woolly fur of edges of parachute, and of scrotum, grey, strikingly different to the rufous fur around. Upper surface of hands and feet brown instead of black. Black of underside of wrists and ankles extending nearly half way towards the elbows and knees. Tail of a paler, duller, rufous than in *P. nitida*, and its basal half, especially below, more heavily washed with black.

Skull markedly smaller than in *P. nitida*. Nasals short, very widely expanded anteriorly, and abruptly narrowed behind. Zygomata more widely and evenly expanded than in the allied species.

Dimensions of the type, measured on the dry skin, and therefore only approximate :—

Head and body 380 mm., tail 480, hind foot s.n. 66, c.n. 74, ear 27.

Skull, basilar length 52; greatest breadth 43; nasals, length 19; greatest breadth 13; least breadth 6·4; interorbital breadth 15·2; tip to tip of postorbital processes 36·2; postorbital constriction 17; palatal length 29·5; diastema (to front of  $p^4$ ) 15; tooth row (from front of  $p^4$ ) 14·7.

*Hab.* Bunguran Island, Natuna Group.

*Type.* Male. B.M. No. 94. 9. 28. 10. Collected 6 Oct. 1893, by A. Everett.

\* Nov. Zool. II. p. 490.

# NOVITATES ZOOLOGICAE.

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No. 4.

## NOTE ON TWO MANGABEY-LIKE MONKEYS (*CERCOCEBUS HAGENBECKI* AND *SEMNOCEBUS ALBIGENA ROTHSCILDI*), NOW LIVING IN THE MENAGERIE OF THE ZOOLOGICAL SOCIETY.

By R. LYDEKKER.

IN the description of *Cercocebus chrysogaster*, published in this Journal for August last,\* mention was made of a young *female* mangabey in the menagerie of the Zoological Society of London, which was then labelled *C. fuliginosus*, although it is clearly distinct from that species, and is provisionally assigned by Mr. Rothschild† to the one first named. This little monkey, which now shares the cage of the type *male* of *C. chrysogaster*, possesses the flesh-coloured eyelids characteristic of the more typical representatives of *Cercocebus*, but is distinguished by the hairs on the crown of the head, as well as some of those on the back, the outer surface of the limbs, and the upperside of the tail being annulated with black and yellow after the fashion so prevalent in *Cercopithecus*. The majority of the hairs on the upper-parts (exclusive of the head) and limbs are, however, of a uniform pale slaty grey colour: while on the under-parts the hue of the fur is very pale greyish white. The face is black and the callosities are reddish. In its habit of carrying its tail curled over its back, in its scream-like cry, as well as in the relative shortness of its thumb, this animal agrees with other *Cercocebi*, which it also resembles, as already mentioned, in its flesh-coloured upper eyelids.

Recently Mr. Rothschild has deposited in the Society's menagerie a small and young *male* monkey (see vol. viii. Pl. I. fig. 1), which agrees very closely in the colour of the pelage with the above-mentioned *female*, but differs in possessing dark upper eyelids. Apart from this feature, it has all the *Cercocebus* characteristics enumerated in the preceding paragraph. The fur on the upper-parts is generally very light slaty grey; but on the head, back, outer sides of limbs, and the upper surface of the tail some of the hairs are ringed with black and yellow, like those of so many of the *guenons*; this speckled character of the pelage attaining its maximum development on the head, where it is practically universal. The face is black. The under-parts and the inner-sides of the limbs are very pale greyish white.

It will thus be seen that the coloration of the fur of this animal is practically identical with that of the above-mentioned *female*. And it accordingly becomes a question whether the colour of the upper eyelid may differ in the two sexes, being black in the *male* and white in the *female*. At present we have no decisive evidence

\* Vol. vii. p. 279 (1900).

† *Loc. cit.*

of sexual colour variations in this group of monkeys (which might also be taken as an argument against the *female* belonging to *C. chrysogaster*), but the case of the proboscis monkey shows that very marked sexual differences may occur in the form of some monkeys. It might also be urged that both the *male* and *female* under consideration are hybrids between *Cercocebus* and *Cercopithecus*; but in the absence of any direct evidence that such is the case, it seems inadvisable to entertain this hypothesis.

Putting, then, on one side both the supposition of hybridism and the *female* specimen, it seems, so far as we may judge from an immature animal, that the *male* specimen cannot be assigned to any named species of *Cercocebus*. And since it appears to be intimately connected with the more typical members of that genus by the above-mentioned *female*, it may be provisionally regarded as the representative of a new species, which may be appropriately named *C. hagenbecki*, after Mr. C. Hagenbeck, of Hamburg.

It must remain for *post-mortem* examination to determine whether this race differs from typical species of *Cercocebus* in the form of the last lower molar; and if so, whether it should be regarded as representing a genus, or subgenus, connecting the latter with *Cercopithecus*. In the character of its fur it is certainly intermediate between the two; and by the black upper eyelid it is differentiated from typical *Cercocebi*. But, on the other hand, it should be remembered that in the undetermined *female* we have the same mingling of mangabey and guenon hair associated with a mangabey eyelid, while in *C. chrysogaster* we find a completely guenon pelage correlated with the mangabey eyelid.

The *female*, I am informed by Mr. Selater, was presented to the Society by the Rev. A. Christopher, and came from the Mobangi River, about three hundred miles above its junction with the Congo. The *male* was brought down the latter river.

Turning to the second specimen (see vol. viii. Pl. I. fig. 2), we find that this is likewise an immature *male*, which is specially characterised by its almost wholly black colour, and the presence of a backwardly-directed crest of long hair running from the centre of the forehead to the occiput and terminating in a point about the vertex of the head. This crest gives to the animal an appearance which cannot be mistaken when once seen. In colour the animal is almost completely black; but the whiskers, which are large and spreading, show a slaty tinge, and there is probably some tendency to slaty on the shoulders and nape, although this is difficult to determine in the living animal. The upper eyelids are as dark-coloured as the rest of the face; but the callosities are of a bright orange-red. The tail, which is nearly bare below, is slightly tufted at the end, and the hair generally is somewhat long and coarse, being more elongated on the nape and shoulders than elsewhere.

With the exception of the crest on the head and the black upper eyelids, the animal presents all the features mentioned under the heading of the preceding form as distinctive of *Cercocebus* from *Cercopithecus*.

In its general characteristic this monkey accords with *Cercocebus albigena* (Gray\*), from West Africa, of which the type skin is in the British Museum (No. 51. 1. 19. 30); both specimens showing the general black colour, the cranial crest of hair, and the black upper eyelid. In regard to the last-mentioned feature, it may be observed that Gray, in his *British Museum Catalogue of Monkeys, Lemurs, and Fruit-eating Bats*,† gave white eyelids as characteristic of all species

\* *Proc. Zool. Soc. Lond.* 1850. p. 77. pl. xvi. (*Presbytes*).

† 1870. p. 26.



of *Cercocebus*, inclusive of *albigena*; and this erroneous statement has been copied by all subsequent compilers. *C. albigena* differs, therefore, from the more typical *Cercocebi*, not only by its crest of long hair, but likewise by its black upper eyelid; and there is accordingly much to justify its separation as a subgenus or genus apart, for which Gray's name of *Semnocebus* \* is available.

As regards minor characters of the typical *C. albigena*, it may be mentioned that it has a long superciliary fringe, but the cranial crest is comparatively short and confined to the occipital region of the head. The whiskers are moderately developed, and of a pale grey colour; and this greyness spreads to some extent over the shoulders, nape, and chest. In Gray's *Catalogue* it is stated that the callosities are black; but, from an examination of the specimen, there is little doubt that in life they were bright-coloured.

A young skin in the Museum (No. 65. 12. 83), taken from a specimen formerly in the Zoological Gardens, agrees in many features with the type, but in other respects comes nearer to the next example.

This is a mounted *male* skin (also from the Zoological Gardens) in the same collection (No. 57. 8. 3. 3), in which the crest extends along the whole length of the middle line of the head to join a superciliary fringe, which is long. The cheeks are thicker than in the typical *albigena*, and the whiskers are larger. On the nape, chest, and upper part of the arms, the hair is blackish brown, and the whiskers have a slaty tinge.

So far as I can gather, this specimen accords very closely with the description of *Cercopithecus aterrimus* Oudemans,† which was founded on a young specimen from the Congo, subsequently referred by Mr. P. L. Selater‡ to *Cercocebus*, and still later identified by Mr. Jentink§ with *C. albigena*. It is true that the form of the crest is not specially referred to in the description, but even if this differ from the foregoing specimen, such difference may be due to immaturity.

Regarding, then, the two foregoing specimens as probably referable to *aterrimus*, the living monkey under consideration (vol. viii. Pl. I. fig. 2) differs by the total absence of the forwardly projecting superciliary fringe of long hairs, as well as by the still more peaked form of the head-crest, and the presence of large whiskers in front of and partly concealing the ears. Its general colour is uniformly black, and the face is more hairy than in the large undetermined *male* mentioned below now living in the Gardens. If No. 57. 8. 3. 3 be rightly identified with *aterrimus*, the present animal apparently indicates another race of the species, which may be provisionally called *Semnocebus albigena rothschildi*.

I now come to a monkey of the same general type presented by Sir H. H. Johnston to the Zoological Gardens. It is a *male*, and was obtained near Lake Tanganyika; its skin is now in the British Museum (No. 95. 4. 28. 1). This animal was at first identified by Mr. Selater|| with *C. albigena*, but subsequently provisionally assigned by him to *C. aterrimus*.

It has the head-crest small and occipital in position, as in the typical *albigena*; but the superciliary fringe is much shorter, and the whole face and fore-quarters are entirely black. It accordingly appears to indicate a fourth race of the species, for which the name *albigena johnstoni* may be suggested.

Mr. O. Nenmann (*Zool. Jahrbüch.* vol. xiii. p. 533. 1900), states that these

\* Gray, *op. cit.*, p. 27.

† *Zool. Garten*, vol. xxxi. p. 267 (1890).

‡ *Proc. Zool. Soc. Lond.*, 1893. p. 256.

§ *Ibid.* 1895. pp. 338 and 339.

|| *Op. cit.* 1894. p. 594.

monkeys, which he identifies with *aterrimus* of Oudemans, are abundant in Uganda. The fully adult individuals are distinguished from the typical *albigena* by the very dark brown (instead of light grey) shoulders ; but the young are uniformly black.

If, then, it be thought advisable to separate, either subgenerically or generically, these black and crested mangabeys with dark eyelids from the smooth-headed *Cercocebi* with white upper eyelids, we shall have the following forms : viz.,—

1. *Semnocebus albigena albigena*. Head-crest short and occipital in position ; a superciliary fringe ; whiskers greyish. West Africa.

2. *Semnocebus albigena aterrimus*. Head-crest long, and occupying whole middle portion of head ; a long superciliary fringe ; whiskers small, greyish, and not concealing ears, and the hair on nape and shoulders blackish-brown. Typically from the Congo district.

3. *Semnocebus albigena rothschildi*. Head-crest peaked and occupying middle of head ; no superciliary fringe ; large whiskers in front of and partly concealing ears ; colour wholly black, or nearly so. Probably from the Congo.

4. *Semnocebus albigena johnstoni*. Head-crest as in *alb. albigena*, but superciliary fringe shorter, and whole of upper-parts uniformly black. Lake Tanganyika district.

It may be added that if *C. chrysogaster* and *C. hagenbecki* are retained in *Cercocebus*, the ordinary definition of that genus must be modified in regard to the statement that the hairs are never annulated ; and in the case of the male, at least of the latter, in respect to the universal presence of flesh-coloured upper eyelids.

In conclusion, I may mention that a large adult *male* of this species (locality unknown), recently presented to the Zoological Society, agrees with the typical *albigena* in the length of the hair and its grey colour on the sides of the head, chest, and shoulders, as well as in the almost completely bare face, and the absence of whiskers in front of the ears. There is, however, no forwardly projecting fringe of long hairs above the eyes, which is so conspicuous in the type skin of *albigena*, as well as in Dr. Gray's figure of the same ; and the crest of hair extends all over the head, and is considerably more voluminous than in the latter, although entirely lacking the peaked form which is displayed in the specimen here figured. It is difficult to believe that these differences are individual or due to age ; and if they are not, this monkey indicates a distinct race.

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END OF VOL. VII.





















J.G. Keulemans del. et lith.

Mintern Bros imp

1. MYZOMELA ALBIGULA Hart. ♂. 2. ERYTHROMYIAS BURUENSIS Hart. ♂.  
3. GEOCICHLA DUMASI Rothsch. ♂.







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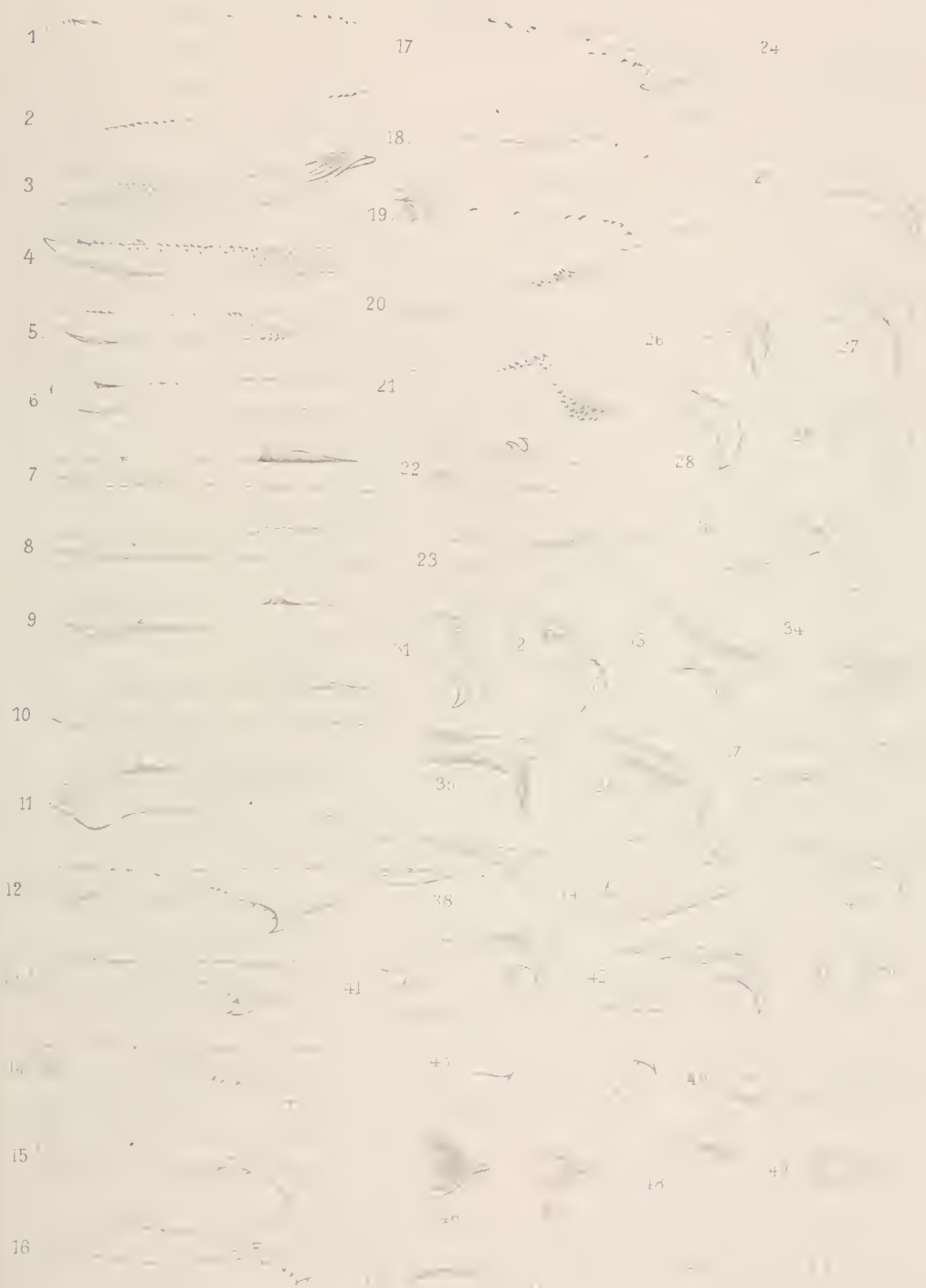






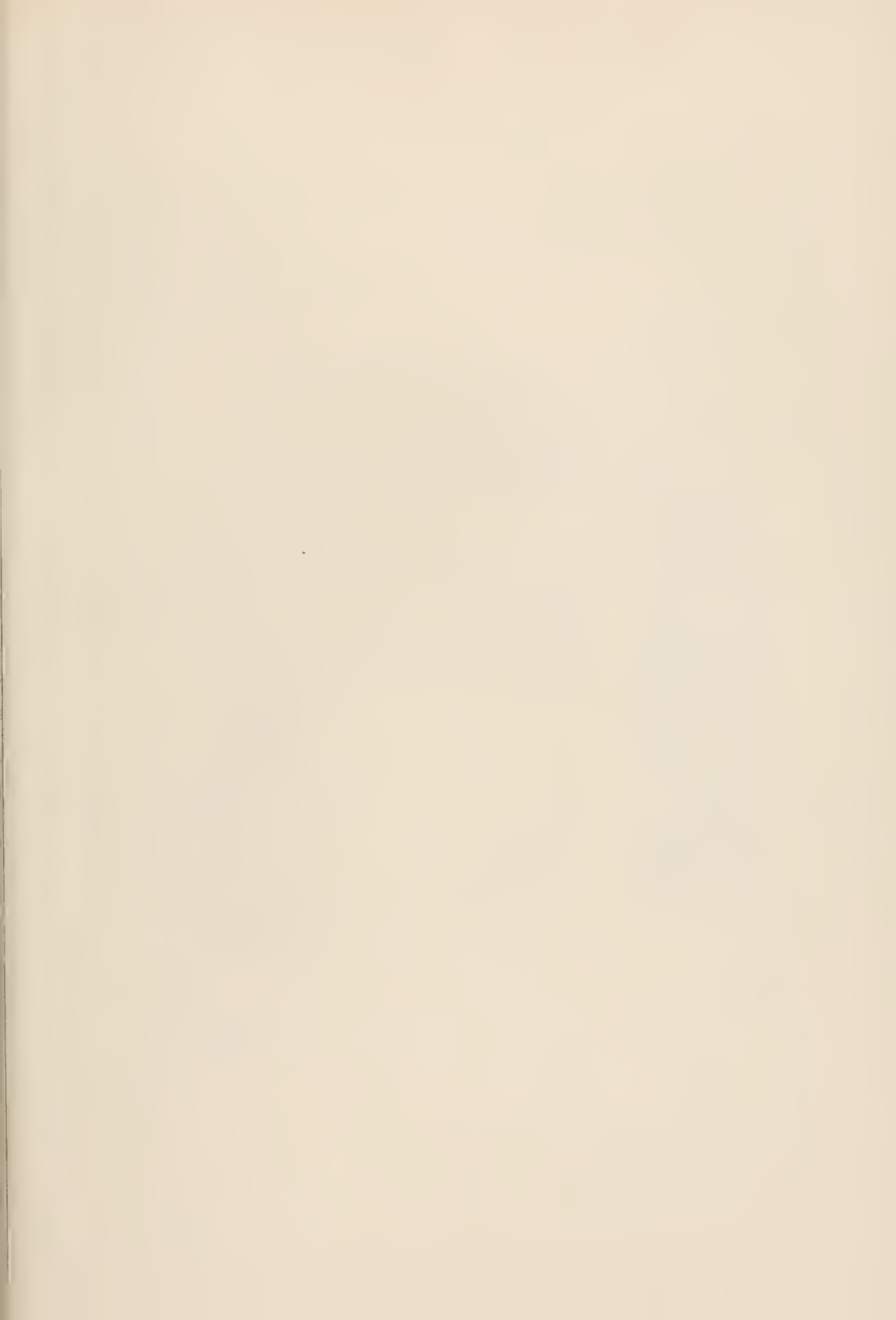












## EXPLANATION OF PLATE IX.

- Fig. 1. *C. gallinae* . Sexual apparatus \* of ♂.
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\* In all cases the penis has *not* been drawn.

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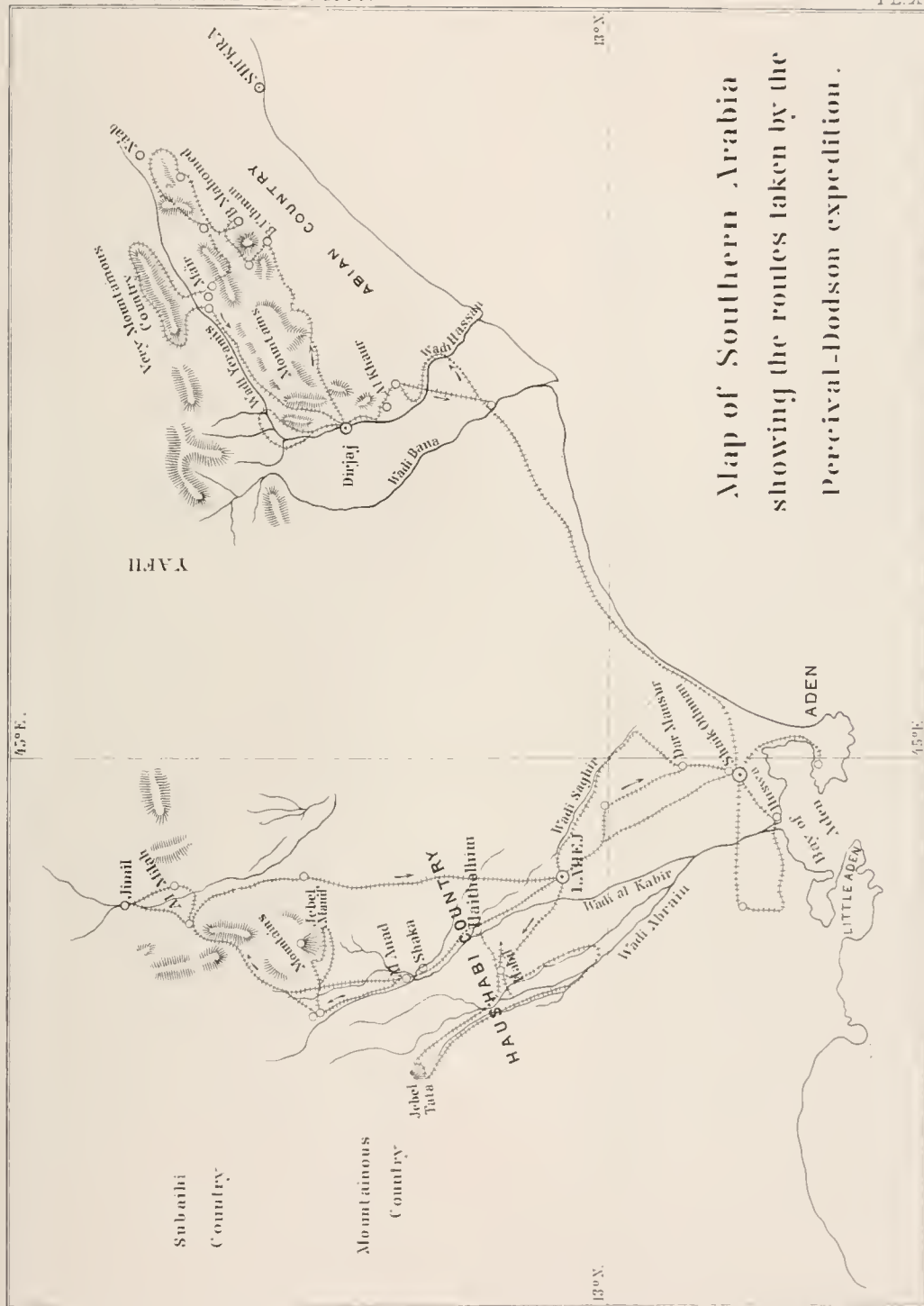
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THE HON. WALTER ROTHSCHILD, PH.D.,  
ERNST HARTERT, AND DR. K. JORDAN.

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